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Tartalom - *Contents*

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A desedai Községi-erdő talajlakó pókfajainak vizsgálata (Aranea)

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Üst, N., & Farkas, S.: *Examination of the soil dwelling spiders in Községi Forest near the Deseda lake, SW Hungary.*
Abstract: In 2011, an aracnological investigation was carried out in Községi erdő near the Deseda lake, local Nature Conservation Area, SW Hungary. The material was recorded by pitfall traps in 13 different habitats. Altogether 5410 specimens were collected. Five species were very abundant (40,77%), namely *Allagelena gracilens, Dysdera ninnii, Haplodrassus silvestris, Ozyptila praticola, Trochosa terricola*. They annual activities and habitat preferences were also examined with 10 figures.

Keywords: Arenea, annual activity, habitat preference, Hungary

Bevezetés

A Kárpát-medence területén a fajok száma megközelíti az 1000 fajt, Magyarországon az ismertté vált pókfajok száma: 725 faj (Szinetár 2006). Somogy megye területén eddig 334 pókfajt mutat-tak ki, ez a hazai fauna 46%-a (Szinetár 2001). Néhány természetvédelmi terület (Boronka-melléki TK - Szinetár 1992, Dráva mente - Szinetár 1998, Látrányi Puszta TT - Szinetár és Keresztes 2003) alapfaunájának vizsgálata kivételével, a megye nagy része mindmáig feltárat-lannak tekinthető, így a fajok száma még jelentősen emelkedhet. Somogy más területeiről, pl.: a Zselicből, vagy a Külső-Somogyi-dombság területéről azonban egyáltalán nincsenek publikált és gyűjteményi adatok. Így Somogy megyében a Deseda-tó helyi jelentőségű természetvédelmi területről sem rendelkeztünk faunisztikai adatokkal.

A terület vizsgálatát a Kaposvári Egyetem talajzoológiai munkacsoportjának keretében kezdtük el, amely nemcsak a talajlakó pókfaunára terjedt ki, hanem az ászka (Isopoda), futóbogár (Carabidae), ezerlábú (Chilognata) fauna vizsgálatát is magában foglalta.

A terület felmérésekor a pókközösség domináns pókfajainak élőhely-preferenciáját és időbeli eloszlását vizsgálatuk.

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Anyag és módszer

A kutatás mintavételi területe a Külső-Somogyban található Deseda-tó nyugati partján húzódó (Községi-erdő) volt. Az erdőt keletről a Deseda-tó, míg a többi oldalról mezőgazdasági területek határolják. A barna erdőtalajon kialakult őshonos vegetáció feltehetően gyertyános-kocsánytalan (*Querco petreae-Carpinetum*) és cseres tölgyesekből (*Quercetum petreae-cerris*) állhatott. Jelenleg különböző erdőállományok alkotják, melyek között tiszta gyertyánosok, aká-cosok, fenyvesek és vörös tölgyesek is előfordulnak.

A talajfauna felmérése talajcsapdázással történt. A mintavételezést 13, egymástól távol eső területen folytattuk (1. ábra). A mintavételezés során vizsgáltunk: 2 akácos (A1, A2), egy korhadékokkal fenyves (F), 5 tölgyes (T1, T2, T3, T4, T5), 2 gyertyános (GY1, GY2), egy ártéri (TÓ) egy vegyes, (V), és ruderális (R) társulást Ez utóbbi társulás egy út mentén egy aranyvesszős magas füves terület (1. ábra).

A mért avartömeg illetve vastagság a tölgyes élőhelyeken (T2, T3, T4, T5), déli kitettségű gyertyánosunkban (GY2) volt a legmagasabb.

1. ábra: Mintavételi helyek a Deseda-tó környékén

A csapdákat 2011 márciusában elején helyeztük el, majd ezt követően három hetenként ürítettük őket. Az utolsó csapdákat 2011 novemberében szedtük fel. Minden mintahelyen egységesen 9 db Barber-féle talajcsapdát ástunk le, 3×3 sorban, egymástól 15 m-es távolságban. a csapdákba 75%os etilén glikolt töltöttem.

Akutatás során lemértük az egyes élőhelyeken az avarvastagságot illetve annak tömegét is.

A gyűjtött anyagot a Kaposvári Egyetem Talajzoológiai munkalaborjában helyeztük el. A határozáshoz LOKSA (1969), ROBERTS (1996) munkáját használtuk. Az adatokat MS Access 2003 adatbázisban rögzítettük.

A fajok felszíni aktivitását arányosnak tekintettük azzal a relatív egyedszámmal, amelyet a talajcsapdákban találtunk az idő függvényében.

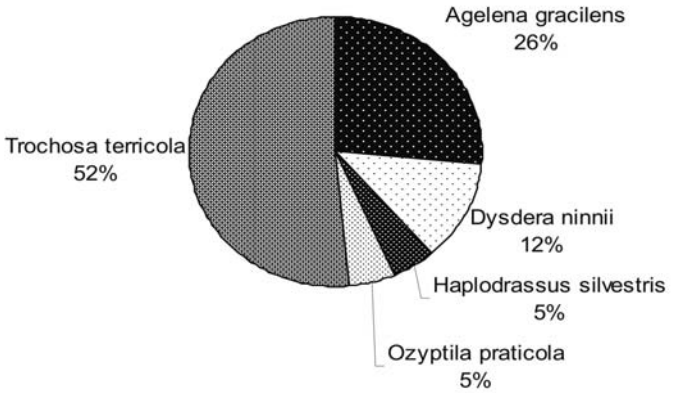
Az élőhelyek preferenciáját az egyes mintavételi helyeken előkerült példányok mennyi-ségi adatainak százalékos gyakoriságával fejeztük ki. A vizsgált domináns fajok élőhe-lyenkénti dominánciáját oszlopdiagrammok segítségével elemeztük.

Eredmények

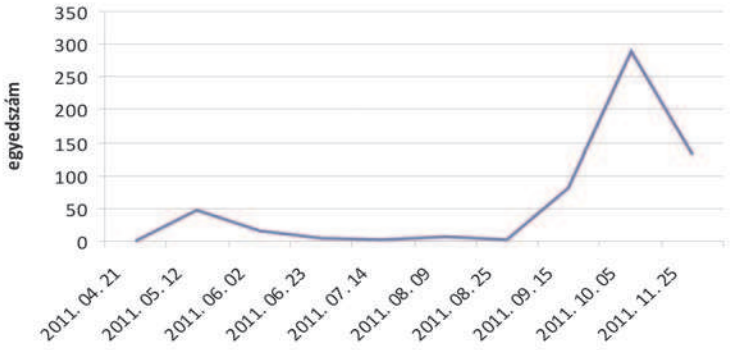
A 2011 márciusa és 2011 novembere között összesen: 5410 példányt gyűjtöttek a talajcsapdák, amelynek 40,77 %-át mindössze öt faj: *Allagelena gracilens* (C. L. Koch, 1843) (582 példány), *Dysdera ninnii* (Canestrini, 1868) (268 példány), *Haplodrassus silvestris* (Blackwall, 1833) (107 pédány), *Ozyptila praticola* (C. L. Koch, 1837) (116 példány), *Trochosa terricola* (Thorell, 1856) (1133 példány) alkotta. A domináns és szubdomináns fajok megoszlását a 2. ábra mutatja.

A legmagasabb számban a *T. terricola*, több mint 1100 egyede került begyűjtésre, ami a teljes anyag 20,94% át tette ki, ezzel eudomináns fajnak minősül a területen, míg a legkevesebb példányban a domináns fajok között a *H. silvestris* került elő, de az a faj is több mint száz példányban került elő.

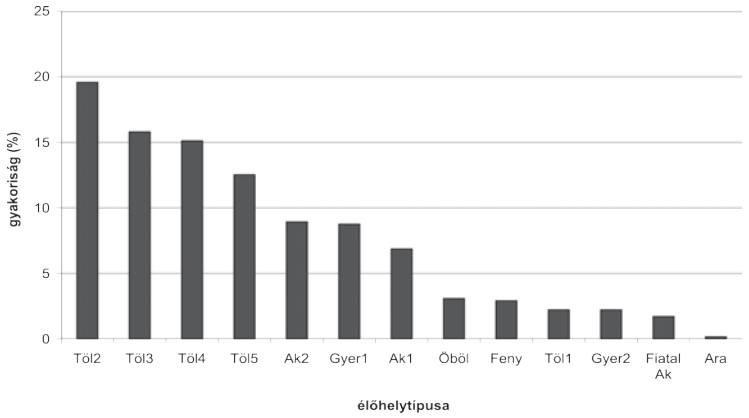
Vizsgálat során összesen: 113 faj vált ismertté. Közülük három védett faj is előkerült: *Atypus piceus* Sulzer, 1776, *Atypus muralis* Bertkau, 1890, *Dolomedes fimbriatus* Clerck, 1757.



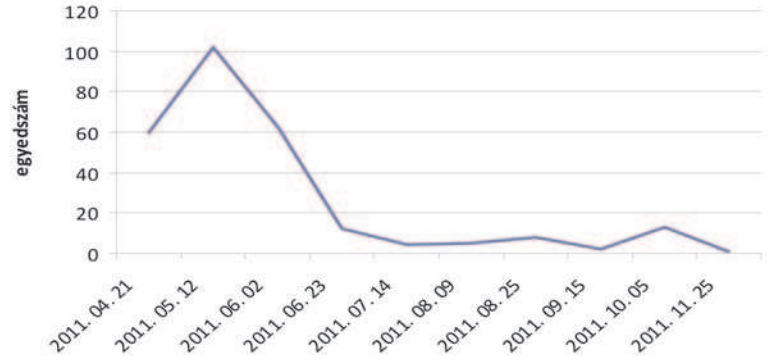
2. ábra: A domináns fajok százalékos megoszlása



3. ábra: Az *Allagelena gracilens* egyedszámának változása az idő függvényében



4. ábra: Az *Allagelena gracilens* élőhely-preferenciája



5. ábra: A *Dysdera ninnii* egyedszámának változása az idő függvényében

Felszíni aktivitás és élőhely-preferencia

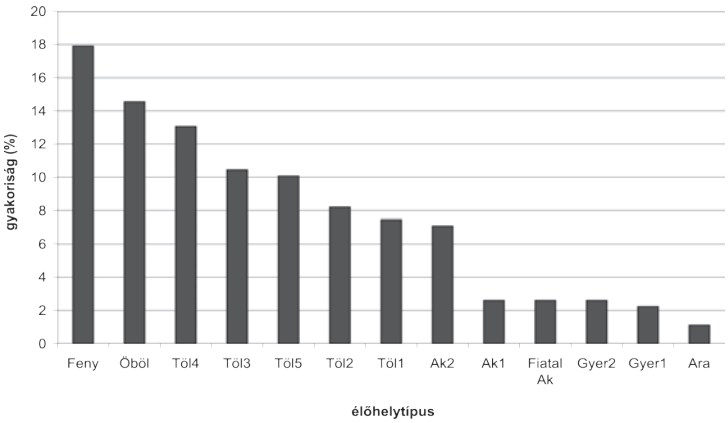
Az *Allagelena gracilens* begyűjtött egyedek számának éves eloszlása a 3. ábrán látható. Megfigyelhető, hogy az első egyedeket április közepén csapdáztuk, számuk emelkedett május közepéig, feltehetően ekkor volt az első párzási időszak. Majd ezt követően az egyedszám csökkent, ez tartott egészen augusztusig, majd innentől rohamosan emelkedett a számuk. Október 5-i mintavételezéskor érte el a legmagasabb egyedszámot. Ez alapján elmondhatjuk, hogy ez a faj egy kora tavaszi, de leginkább őszi aktivitású pók faj.

Az *A. gracilens* a mintavételezések során legnagyobb számban egy ruderális vegyes állományú, valaha tölgyesből álló erdőrészben csapdáztuk. A cserjeszint és az aljnövényzet egyaránt sűrű és magas volt, így ez kiváló élőhelyet biztosít ennek az állatnak, ugyanis a faj magas aljnövényzetbe szövi tölcsér alakú hálóját.

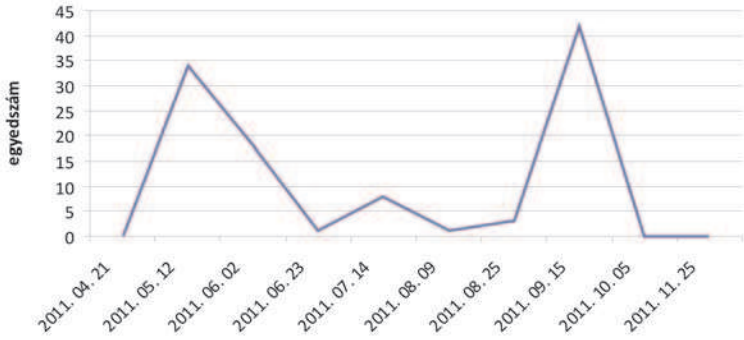
Az *A. gracilens* (4. ábra) Egy tölgyesekkel benőtt domb délnyugati, valamint ugyanazon domb tetején és a keleti oldalán elhelyezkedő tölgyesben is kiemelkedő mennyiségben volt jelen, de ezek között nem mutattunk ki különbséget. Az eredmények alapján, a faj a magas aljnövényzetű tölgyeseket kedveli.

A *Dysdera ninnii* faj egyedszáma tavasszal volt a legmagasabb (5. ábra). Feltehetően a pár-zási időszak májusban van, majd a párzás után az egyedszám rohamosan csökkenni kezdett. Ezt követően az egyedszáma a nyári időszakban alacsony, majd októberben, ismét kismértékű emelkedés látható, ami október közepén tetőzött.

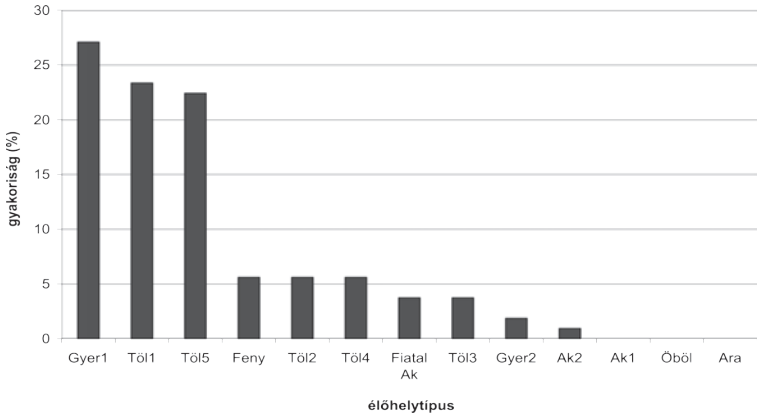
A *D. ninnii* egyedszáma (6. ábra) a fenyves élőhelyen magas volt a többi élőhellyel szemben; itt a számuk nagyban eltért. Itt a talajt nagy mennyiségben borították korhadt fák a csapdák környékén. Tekintve hogy ez a faj potenciális predátora egyes lebontó fajoknak, például ászkarákoknak így ezzel magyarázható a faj nagyszámú jelenléte magas elhalt szerves anyagtartalmú területeken. A többi élőhellyel összehasonlítva jelentős eltérést figyeltünk meg a tóparti vegetá-cióban valamint a dombtetőn elhelyezkedő tölgyes élőhelyeken is.



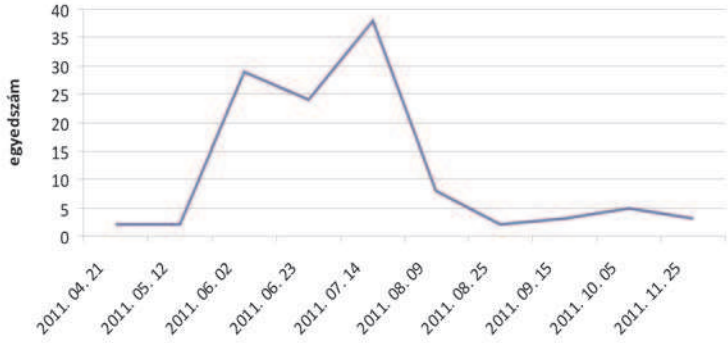
6. ábra: A *Dysdera ninnii* élőhely-preferenciája



7. ábra: A *Haplodrassus silvestris* egyedszámának változása az idő függvényében



8. ábra: A *Haplodrassus silvestris* élőhely-preferenciája



9. ábra: Az *Ozyptila praticola* egyedszámának változása az idő függvényében

A *Haplodrassus silvestris* éves egyedszám eloszlása a 7. ábra alapján jól kirajzolódik. Két akti-vitási csúcsot figyelhetünk meg. A fajnak van egy kora nyári aktivitási csúcsa, ami áprilistól júliusig tartott, valamint van egy erős őszi aktivitási csúcsa is szeptembertől október közepéig. Október közepére az egyedek teljesen eltűntek.

A *H. silvestris* (8. ábra) kedvelte a gyertyános és két tölgyes élőhelyet preferált a legjobban. Ezekben jelentősen magasabb egyedszámban fordult elő a többihez képest. A tóparti vegetációt, valamint az akácos élőhelyeket kedvelte legkevésbé. Itt szintén jelentős eltérést figyeltünk meg a többi élőhellyel szemben.

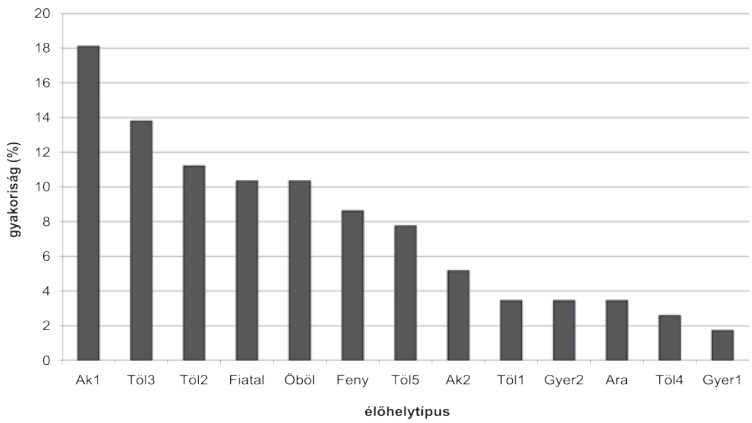
Az *Ozyptila praticola* aktivitása június-július hónapokban haladta meg jelentősen az egyéb hónapokban számított átlagos egyedszámot (9. ábra). Októberi mintavételezéskor még észlelni lehetett egy kis mértékű egyedszám növekedést, de novemberre ez is lecsökkent. Ennek oka hogy az egyedek a vegetációs időszak végére párzás után elpusztulnak.

Az *O. praticola* esetében az egyik akácos élőhely (akác1) kimagasló mértékben eltérőnek bizonyult a többitől (10. ábra). Ezt követően egy tölgyesben került elő nagy egyedszámban. Általánosan elmondható, hogy zavart magas aljnövényzetű erdőállományokban, nagy mennyiségben fordult elő.

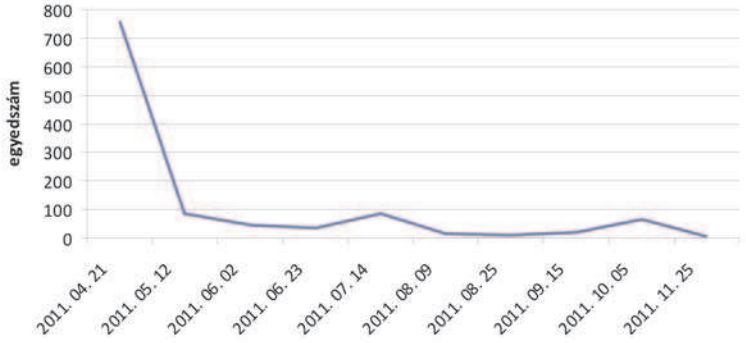
Ilyen típusú élőhelyek voltak a fenyves, a fiatal telepítésű tölgyes, a tóparti vegetáció, a sűrű aljnövényzetű öreg cseres-tölgyes vagy a nyugati kitettségű domboldalban elhelyezkedő cseres-tölgyes élőhely.

A tavaszi hónapokban nagy mennyiségben kerültek elő a *Trochosa terricola* példányok, majd számuk rohamosan csökkent száz egyed alá (11. ábra). Ez a faj a legmagasabb egyedszámban került elő a többi domináns fajhoz képest is. A csapdák által befogott összegyedszámnak több mint 10 %-át ez a faj tette ki. A *T. terricola* a mintavételi terület eudomináns pókfaja.

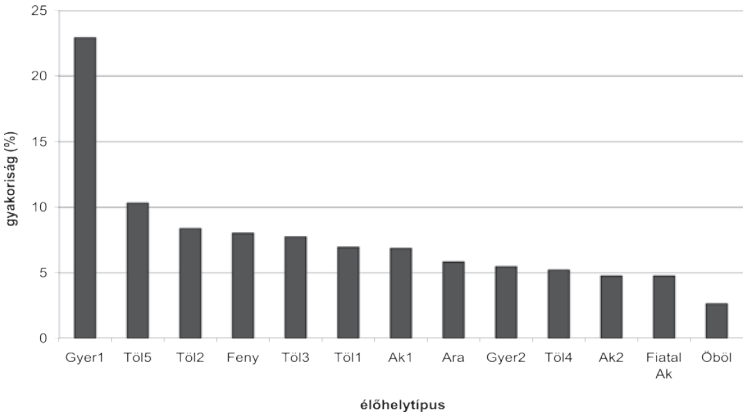
A vegetációs időszak során, a nagymértékű pusztulás ellenére, tökéletesen kirajzolódik, hogy a létszámuk a kiugró tavaszi csúcson kívül, ahol jelentős eltérés volt a többi mintavételezési időszakkal szemben két ponton tetőzik. Feltehetően két ciklusban zajlik náluk a párzás. Az 11. ábra alapján ennek időszakai nyár közepe és ősz közepére tehető.



10. ábra: *Ozyptila praticola* élőhely-preferenciája



11. ábra: A *Trochosa terricola* egyedszámának változása az idő függvényében



12. ábra: A *Trochosa terricola* élőhely-preferenciája

A *T. terricola* a többi fajhoz képest viszonylag nagy számban fordult elő mindenhol (12. ábra). Legnagyobb mennyiségben egy déli kitettségű gyertyánosban került elő, amely az összes többi élőhellyel szemben nagy különbséget mutatott. Legalacsonyabb számban a vizsgált vizes élőhelyen csapdáztuk.

Értékelés

A 2011-ben a Deseda-tó helyi jelentőségű természetvédelmi területen a következő fajok bizonyultak dominánsnak: *A. gracilens, D. ninnii, H. silvestris, O. praticola* és *T. terricola*, Az *A. gracilens* egy őszi hónapokban aktív faj, ami leginkább a magas aljnövényzetű tölgyeseket kedveli. A *D. ninnii* egy tavasszal aktív faj ami főleg a fenyves élőhelyeket kedveli, továbbá a vízparti valamint a tölgyes élőhelyeken volt magas az egyedszámúk. A *H. silvestris* gyertyános tölgyesekben fordult elő nagy számban, egy kora nyári és egy kora őszi időpontban. Az *O. praticola* a nyári időszakban volt aktív, májustól augusztusig. Egy akácosban került elő a legtöbb egyede, de nagy számban volt jelen zavart, vegyes összetételű erdőállományokban is. A *T. terricola* egyedszáma meghaladta a teljes mintavételezésben begyűjtött összes faj egyedszámának 10%-át tehát eudominánsnak tekinthetjük. Egy gyertyános-tölgyesben fordult elő kimagasló mennyiségben, továbbá tölgyes élőhelyeken került elő nagy számban. A faj esetében egy júliusi és egy októberi aktivitási csúcsot figyeltünk meg.

Köszönetnyilvánítás

Ezúton szeretnénk köszönetet nyilvánítani Dr. Szollát Györgynek, aki a vizsgálati terület növénytársulásainak megállapításában volt segítségünkre.

Irodalom

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Natura Somogyiensis	25	15-20	Kaposvár, 2014

Tullbergiidae fauna (Collembola) in Kermanshah province (Iran) with addition of new records

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Kahrarian, M., Vafaei-Shoushtari, R., Soleimannejadian, E., Shayanmehr, M., & Shams-Esfanabad, B.: *Tullbergiidae fauna (Collembola) in Kermanshah province (Iran) with addition of new records.*
Abstract: In this study, the fauna of Tullbergiidae was investigated in different regions of Kermanshah province during 2012-2014. The specimens were collected from the surface layer of soil and leaf litter. Totally 6 species and 3 genera were found. The species *Metaphorura denisi* (Bagnall, 1935), *M. macrochaeta* (Rusek, 1976), *M. italica* (Thibaud, 1996), *M. hylophila* (Rusek, 1982) and *Fissuraphorura duplex* (Lucianez & Simon, 1992) are new for the fauna of Iran; it is also the first time that the genera *Fissuraphorura* (Rusek, 1991) is reported for the fauna of Iran. More ever the species *Fissuraphorura duplex* is reported for the first time from Asia.

Keywords: new genera, new species, Iranian fauna.

Introduction

Collembola are one of most abundant soil animals in most terrestrial ecosystems. Among Collembola, Tullbergidae is one of the smallest collembolan family and easily recognized by very small size (0.4-1.5 mm except *Tullbergia antarctica* Lubbock, 1876 which is 3-4 mm), without pigmentation, eyes and furcula (Palacios-Vargas & Salazar- Martinez 2014). The body chaetotaxy of the taxa are very similar, and the main differences among the genera are the sense organ structure of antennal organ III, and the chaetotaxy of the antennal segment IV. The type and number of the pseudocelli and the shape and number of vesicles of postantennal organ are important in identification of species and genera level (Palacios-Vargas & Catalan 2013).

Although Tullbergiidae has a total of 32 genera and 216 species in the world (Bellinger et al. 2013); but only 7 species in 4 genera are known from Iran (Cox 1982, Yoosefi-Lafooraki & Shayanmehr 2013, Shayanmehr et al. 2013 and Falahati et al. 2013). These species have been found in Iranian localities such as Central part, Mazandaran, Gilan, E. Azarbaijan, Zanjan, a part of Kermanshah province and Kohgiloyeh associated whit soils with high organic matter content. The lack of studies in other parts of the country could explain their absence in other Iranian locations.

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The first study on Tullbergiidae was carried out by COX (1982). He listed Collembola fauna (70 species belonging to 30 genera in 5 families) from the northwestern and central north provinces of the country, which 3 species of them were belonging to Tullbergiidae (COX 1982). After that, other Iranian researchers have just added a few species (3 species and one genus) of this family to the Collembolan fauna of Iran (DAGHIGHI 2012, FALAHATI et al. 2013 and GHARAMANINEZHAD et al. 2013).

Kermanshah is one of Iranian province which located in the middle of the western part of Iran. The preliminary investigation on springtails in Kermanshah was made by KAHRARIAN et al. (2012). They reported 6 families, 15 genera and 9 species which none of them belonged to Tullbergiidae. Data on the Kermanshah fauna of Tullbergiidae are scarce. Prior to this work, only GHARAMANINEZHAD et al. (2013) have studied on this family and reported *Metaphorura affinis* for fauna of Kermanshah (GHARAMANINEZHAD et al. 2013).

Material and methods

This study was carried out during 2012-2014. All specimens were collected from a total of 10 sites ranging in elevation from 566 m to 2302 m a.s.l. from the surface layer of soil and leaf litter (Table 1). The samples were retained in white plastic boxes and transferred to the Lab. The species were extracted by Berlese funnel, fixed in 75% ethanol and cleared in a Nesbitt solution and mounted on slides with Hoyer medium. FJELLBERG's terminology (1998, 2007) was applied for preliminary description and confirmed by Dr. Igor Kaprus.

Abbreviations: Ant. = antennal segment; Abd. = abdominal segment; PAO = postantennal organ; PSO= pseudocelli; Th. = thoracic tergite.

Table 1: Information on the identified species from Kermanshah provinces (Iran)

Species	County/area/Village	N	E	Elevation
Metaphorura denisi	Osmanevand / Patat village	33°57.746'	047°18.723'	1955
	Sar-e-pol-e- Zahab/ Patagh	34°25.773`	046°00.136`	1034
	Chahar zebar-e-oliya	34°13.134`	046°40.074`	1592
	Paveh/Shabankareh village	34°52.978`	046°30.760`	1632
	Sar-e-pol-e-Zahab/Ghalehshahin	34°25.590`	045°54.346`	566
	Sar-e-pol-e-Zahab/Sorkheh Direh	34°23.560`	046°03.191`	1290
Metaphorura affinis	Chahar zebar-e-oliya	34°13.134`	046°40.074`	1592
	Sar-e-pol-e- Zahab/ Patagh	34°25.773`	046°00.136`	1034
	Paveh/Shabankareh village	34°52.978`	046°30.760`	1632
Mesaphorura macrochaeta	Sar-e-pol-e- Zahab/ Patagh	34°25.773`	046°00.136`	1034
	Paveh/Shabankareh village	34°52.978`	046°30.760`	1632
	Eslamabad-e-gharb/Harasam	33°51.399'	046°50.868'	2302
Mesaphorura italica	Sar-e-pol-e- Zahab/ Patagh	34°25.773`	046°00.136`	1034
	Chahar zebar-e-oliya	34°13.134`	046°40.074`	1592
Mesaphorura hylophila	Eslamabad-e-gharb/Harasam	33°51.399'	046°50.868'	2302
Fissuraphorura duplex	Osmanevand/Cheshmeh Sorkh	33°58.319'	047°18.018'	1913

Results and Discussion

A total of 6 species of Tullbergiidae belonging to 3 genera were identified from Kermanshah by this research. The information of collected species is presented in Table 1. The species *Metaphorura denisi* (Bagnall, 1935), *M. macrochaeta* (Rusek, 1976), *M. italica* (Thibaud, 1996), *M. hylophila* (Rusek, 1982) and *Fissuraphorura duplex* (Lucianez & Simon, 1992) are new for the fauna of Iran; it is also the first time that the genera *Fissuraphorura* (Rusek, 1991) is collected and reported for the fauna of Iran.

Remarks on collected species

Genus: ***Metaphorura*** Stach, 1954

Metaphorura affinis (Stach, 1954)

Examined material: 19 exx, soil and leaf litter under Oak trees (*Quercus infectoria*), Shabankareh village, Paveh County, April, November, 2013 and January, 2014; 17 exx, soil and leaf litter under Oak trees (*Q. infectoria*), Chahar zebar-e-oliya area, Kermanshah county, December, 2013 and March, 2014; 1 ex, soil and leaf litter under Oak trees (Q. infectoria), Patagh area, Sar-e-pol-e-Zahab county, March, 2014.

A common species of the Palearctic region. *M. affinis* has been reported previously from Iran (COX 1982, DAGHIGHI 2012, GHAHRAMANI NEZHAD et al. 2013). *M. affinis* is a relatively large member of the subfamily Tullbergiinae. The species is white, blind and possesses an elliptical post-antennal organ with about 20 to 25 simple lobes. There is a tiny needle-shaped empodium on the foot. The most characteristic feature is the presence of a small conical projection on the sixth abdominal segment (abd.6) ventral to the two anal spines (http://ws1.roehampton.ac.uk/collembola).

Metaphorura denisi (Bagnall, 1935)

Examined material: 35 exx, soil and leaf litter under Oak trees (*Q. infectoria*), Osmanevand area (Patat and Abran village), Kermanshah county, December, 2013 and January 2014; 34 exx, soil and leaf litter under Willow tree (*Salix* sp.), Ghaleh Shahin area, Sar-e-pol-e-Zahab County, April, 2014; 18 exx, soil and leaf litter under Oak trees (*Q. infectoria*), Patagh area, Sar-e-pol-e-Zahab county, January and March, 2014; 7 exx, soil and leaf litter under walnut trees (*Juglans regia*), Sorkheh direh village, Sar-e-pol-e-Zahab County, January, 2014; 6 exx, soil and leaf litter under Oak trees (*Q. infectoria*), Chahar zebar-e-oliya area, Kermanshah county, November, 2013 and March, 2014; 5 exx, soil and leaf litter under Oak trees (*Q. infectoria*), Shabankareh village, Paveh County, April, November, 2013 and January, 2014.

It represents the first record of this species in Iran. It is very similar to *M. affinis* but can be recognized by pseudocellar formula. In *M. affinis* pseudocellar formula is 11/111/11111 whilst in *M. denisi* it is 11/122/22221 (FJELLBERG 1998).

Mesaphorura macrochaeta (Rusek, 1976)

Examined material: 40 exx, soil and leaf litter under walnut trees (*J. regia*), Sorkheh direh village, Sar-e-pol-e-Zahab County, January, 2014; 2 exx, soil and leaf litter under Oak trees (*Q. infectoria*), Shabankareh village, Paveh County, November, 2013 and January, 2014; 1 ex, soil and leaf litter under Elm trees (*Ulmus* spp.), Harasam village, Eslam abad-e-Gharb County, March, 2014.

A cosmopolitan species but it is the first record of this species in Iran. *M. macrochaeta* can be recognized by the five setae in tibiotarsal 'B' ring, seta a_2 present on th.3, distance between p_1 setae on abd.4 shorter than the distance between the p_2 setae, seta m_0 on abd.4 absent, 3+3 short setae on abd.5 between the long a_4 setae and anal setae l_2,

present this latter character is the only discernible difference from M. krausbaueri in which anal setae $l_{2'}$ are absent. The PSO formula of *M. macrochaeta* is 11/011/10011 (http://www.stevehopkin.co.uk).

Mesaphorura italica (Thibaud, 1996)
Examined material: 43 exx, soil and leaf litter under Oak trees (*Q. infectoria*), Patagh area, Sar-e-pol-e-Zahab county, January and March, 2014; 14 exx, soil and leaf litter under Oak trees (*Q. infectoria*), Chahar zebar-e-oliya area, Kermanshah county, November, 2013 and March 2014.

A common species of the Palearctic region (FJELLBERG 1998). In Iran this species is reported for the first time. *M. italica* is similar to other species of *Mesaphoura*, but can be recognized by present of m_5 in abd. IV and position of pseudocelli on th.2 (between p_5-m_5) (FJELLBERG 1998).

Mesaphorura hylophila (Rusek, 1982)
Examined material: 14 exx, soil and leaf litter under Elm trees (*Ulmus* spp.), Harasam village, Eslam abad-e-Gharb County, March, 2014.

Widely distributed and Palearctic. It is the first citation of this species in Iran. M. hylophila differs from other species by absence of seta a_2 on th.3 (FJELLBERG 1998). Other character is present of pseudocelli on th.2 between p_5-m_5 (similar to *M. italica*), and seta m_4 absent on abd.4.

Genus: ***Fissuraphorura*** (Rusek, 1991)

It is the first citation of this genus in Iran. In this study one species of this genus is known. The anal spines are simple in this genus. Body pigmentation is absent. Distal end of tibiotarsi without clavate setae or seldom with few weakly developed ones. First thoracic segment with 1 + 1 pseudocelli. Fourth antennal segment without extreme large apical papilla. Postantennal organ with 6-8 coffee-bean-like vesicles in 2 rows. Sense organ of third antennal segment in adults with 2-3 greatly thickened dorsal sensory clubs. Sixth abdominal segment without midventral projection also without dorsolateral spines in front of posterior anal spines (http://www.Collembolan.org).

Fissuraphorura duplex (Lucianez & Simon, 1992)
Examined material: 4 exx, soil and leaf litter under Oak trees (*Q. infectoria*), Osmanevand area (Cheshmeh Sorkh village), Kermanshah county, January 2014.

It is the first citation of this species in Iran and Asia. Body length about 1 mm. granulation relatively fine, somewhat coarser on the head and Abd V+VI. Ant shorter than head diagonal. Ant IV with 5 thickened sensilla (a-e) two sensory rods (f, g) and a ventro-apical papilla. Ant III O as typical for the genus. PAO elongate with a superficial furrow. Pseudocelli af adults with 3-6 stripes in the center. Tibiotarsi without spatulate hairs. Claw without teeth, empodial appendage rudimentary. VT with 7+7 setae (DUNGER & SCHLITT 2011)

Key to genera and species of Tullbergiidae in Kermanshah province (Iran)

1. Sixth abdominal segment with midventral projection - best seen in ventral view, number of anal spines two, Dorsum of sixth abdominal segment without supplementary spines Genus ***Metaphorura***…..... 5
- Sixth abdominal segment without midventral projection …..…….. 2
2. Sense organ of third antennal segment with 3 sense clubs, sixth abdominal segment dorsally smooth except for crescentic ridges at anterior border, PAO elongated, with 18-68 vesicles in 2-3 rows Genus ***Mesaphorura*** .....……. 3
- Sense organ of third antennal segment with 2 sense clubs, sixth abdominal segment with 1 + 1 dorsolateral spines in front of posterior anal spines, PAO with 6-8 long oval vesicles in 2 rows, first to third abdominal segment with 2 + 2 pseudocelli each, (Genus ***Fissuraphorura***) .....……. ***Fissuraphorura duplex***
3. Abd. IV seta p1 is microseta, abd. V seta a2 is as long as a1, mesothorax medial pseudocelli between p5-m5; abd.VI seta l2' absent, metathorax seta a2 present, abd. IV seta m5 present ……..... ***Mesaphorura italica***
- Abd. IV seta p1 is macroseta, ……..…….....……. 4
4. Abd. V seta a2 is as long as a1, mesothorax medial pseudocelli between p3-p4, abd.IV seta m5 present, metathorax seta a2 present, abd.VI seta l2' present in the anal lobe ..... ***Mesaphorura macrochaeta***
- Abd. V seta a2 absent, mesothorax medial pseudocelli between p5-m5; abd. IV seta m5 absent; abd.VI seta l2' absent, metathorax seta a2 absent; abd. IV seta m4 absent ..……..... ***Mesaphorura hylophila***
5. Pseudocellar formula 11/111/11111 ..... ***Metaphorura affinis***
- Pseudocellar formula 11/122/22221 ..... ***Metaphorura denisi***

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New records of Poduromorpha for the Iranian springtail fauna (Collembola)

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Kahrarian, M.: *New records of Poduromorpha for the Iranian springtail fauna (Collembola)*.
Abstract: In this study the fauna of *Poduromorpha* was investigated in west part of Iran (Kermanshah, Hamadan and Lorestan provinces) during 2013 and 2014. The specimens were collected from the surface layer of soil and leaf litter. Among different species of *Poduromorpha*, *Willemia buddenbrocki* (Huther, 1959), *W. scandinavica* (Stach, 1949) and *Axenyllodes monoculatus* (Jordana & Ardanaz, 1981) are recorded as new for the fauna of Iran. *A. monoculatus* is also new for Asia.

Keywords: new genera, new species, Hypogastruridae, Odentellidae.

Introduction

Collembola or springtails comprise one of the most widespread and abundant groups of terrestrial arthropods. They are found everywhere, to the utmost reaches of multicellular animals in the Antarctic and Arctic and in all habitats except the open oceans and deep areas of large lakes. Among Collembola, Poduromorpha is one of the smallest of the four Collembola orders and easily recognized by having a distinct prothorax that bears dorsal setae and third and fourth abdominal segments that are similar in sizes.

The first study on Poduromorpha in Iran was carried out by Cox (1982). He listed Collembola fauna (70 species belonging to 30 genera in 5 families) from the northwestern and central north provinces of the country, which 30 species of them were belonging to Poduromorpha (Cox 1982). After that, other Iranian researchers started to work on the Collembola fauna in several regions of Iran therefore the list of species increased. Western Iran is a large section of this country. Most of the region is co-located with Zagros Mountains starting from Turkey and Kurdistan and ending in Persian Gulf. Data on the Collembolan fauna in west part of Iran are little known. Prior to this work, only a few papers have been published on this subject (Kahrarian & Arbea 2013, Kahrarian et al. 2012, 2013 and 2014, Ghahramaninezhad et al. 2013). These studies have only been conducted in Kermanshah province and there is no data of Collembola in other provinces.

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Material and Methods

This study was carried out in three provinces (Kermanshah, Hamadan and Lorestan) in western part of Iran during 2013-2014. All specimens were collected from the surface layer of soil and leaf litter. The samples were retained in white plastic boxes and transferred to the Lab. The species were extracted by Berlese funnel, fixed in 75% ethanol and cleared in a Nesbitt solution and mounted on slides with Hoyer medium. Fjellberg's terminology (1998, 2007) was applied for preliminary description and confirmed by Dr. Igor Kaprus.

Abbreviations: Ant. - antennal segment; Abd. - abdominal segment; PAO - postantennal organ; PSO - pseudocelli; Th. - thoracic tergite.

Results and Discussion

Among different species of Poduromorpha, two species of Hypogastruridae and one species of Odentellidae were identified as new for the fauna of Iran. Moreover, *Axenyllodes monoculatus* (JORDANA & ARDANAZ 1981) is also new for Asia. Among these species *A. monoculatus* was recorded in the highest density. The species *Willemia buddenbrocki* (Huther, 1959), *W. scandinavica* (Stach, 1949) and *A. monoculatus* were found in Kermanshah province while *A. bayeri* (Kseneman, 1935) was found only in Hamadan province.

Willemia buddenbrocki (Huther, 1959) Family: **Hypogastruridae**

Examined material: 1 ex, soil and leaf litter under oak trees (*Quercus infectoria*), Chahar zebar-e-oliya area, Kermanshah county, Kermanshah, Iran. November, 2013.

Distribution: This species was reported in some countries such as Germany, Italy, Canary Island, Portugal and Nepal (THIBAUD et al. 2004). It is the first record of this species in Iran.

Description: Small species (body length 0.4 mm); ant. I and II with 6 and 11 setae respectively; ant. III with two guard sensilla which long and bent in the same direction (Fig. 1a); ant. IV with a simple, small eversible apical bulb and 6 sensilla, of which 4 subcylindical and 2 (e_3 and i_2) large and spherical situated in two cavites (Fig. 1a). Labral formula: 2/5, 3, 4. PAO with 12-14 simple lobes (Fig. 1b); Tbiotarsi with 11 setae; empodium very small (about one sixth as long as the length of the claw) (Fig. 1c). Anal spines present and relatively long (THIBAUD et al. 2004).

Dorsal chaetotaxy: Head without seta a_0; Th. II and III with 2+2 setae on the row of m; abd. I-III and V with two rows; abd. IV with 3 rows; sensory setae m_7 on Th. II and III and p_4 on abd. II-IV as candle-like sensilla. The others fine and weakly longer than the normal setae. Sternite on abd. II with a_3 setae; sternite of abd. IV with the setae a_3 and m_1 (THIBAUD et al. 2004).

Willemia scandinavica (Stach, 1949) Family: **Hypogastruridae**

Examined material: 1 ex, soil and leaf litter under oak trees (*Q. infectoria*), Koohenany village, Kuhdasht county, Lorestan, Iran. January, 2014; 1 ex, soil and leaf litter under oak trees (*Q. infectoria*), Shabankareh village, Paveh county, Kermanshah, Iran. November, December, 2013 and January, 2014.

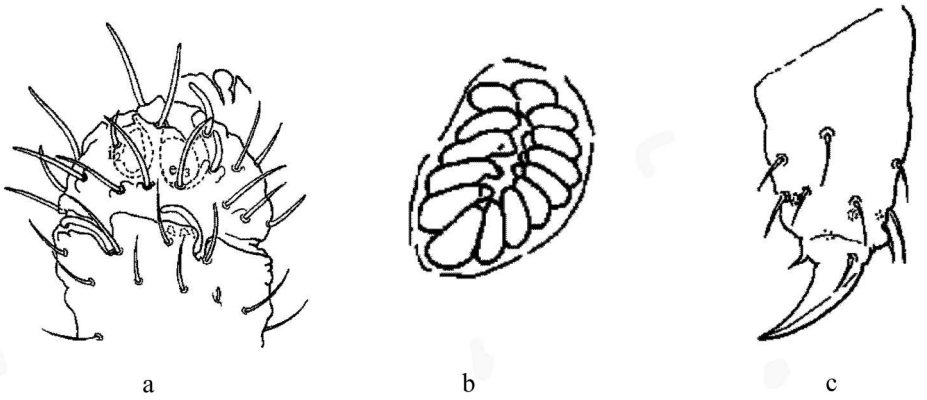

Fig. 1: ***Willemia buddenbrocki.*** **a) ant. IV with reversible apical bulb and ant. III. b) PAO with 14 simple lobes and c) tibiotarsus and claw (THIBAUD et al. 2004)**

Distribution: This species was reported in some countries such as the United States of America, Canada, Mexico, Germany, Austria, Romania, Poland, Norway, Finland, Russia, Italy, the Canary Islands, Portugal, Belarus and Ukraine (THIBAUD et al. 2004). It is the first record of this species in Iran.

Description: Small species (body length 0.6-0.7 mm); ant. I and II with 7 and 12 setae respectively, ant. III with two long and straight guard sensilla (Fig. 2a). ant. IV with a simple, eversible apical bulb and 4 sensilla, of variable shape (Fig. 2a). Labral formula: 4/4, 5, 4. PAO with 5-9 simple lobes (Fig. 2b). Tbiotarsi I-III with 17,17 and 16 setae respectively. Empodial filament about one third as long as the inner edge of the claw. Anal spines small with variable form (THIBAUD et al. 2004).

Dorsal chaetotaxy: Head with seta a_0; Th. II and III with 3+3 setae on row m; abd. I-III and V with two rows; abd. IV with 3 rows. Sensory setae p_4 on abd. I and III weakly candle-like, the others fine and somewhat longer than the normal setae. Sternite on abd. IV with setae a_1 and without row m. Anal vesicle with 18 setae and the setae z and 3 hr present (THIBAUD et al. 2004).

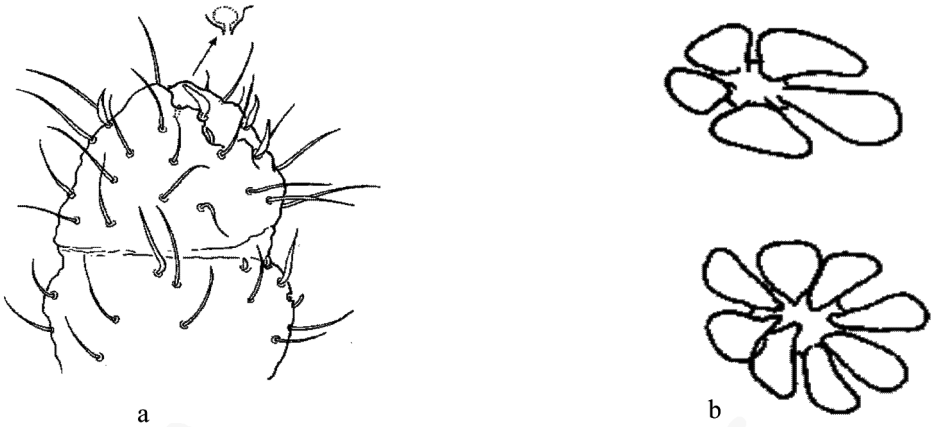

Fig. 2: ***Willemia scandinavica*****. a) ant. IV with reversible apical bulb and ant. III. b) two PAO with 5 and 8 simple lobes (THIBAUD et. al., 2004).**

Axenyllodes monoculatus (Jordana & Ardanaz, 1981) Family: **Odentellidae**

Examined material: 22 exx, soil and leaf litter under oak trees (*Q. infectoria*), Patagh area, Sar-e-pol-e-Zahab county, Kermanshah, Iran. November, 2013 and March, 2014; 1 ex, soil and leaf litter under elm trees (*Ulmus* spp.), Ghaleh shahin village, Sar-e-pol-e- Zahab county, Kermanshah, Iran. April, 2014.

Distribution: This species was reported in a few countries e.g. from Spain (Jordana and Ardanaz 1981) and seems to be a new for Asia.

Description: body elongated with yellowish-white color; strong granulation homogeneously distributed throughout body, forming symmetrical drawings dorsally on each segment. All segments of the body covered with relatively short hairs; thorax I with a row of hairs, thorax II and III with three rows and abdominal segments with two rows of hairs (Fig. 3d). Antenna conical, typical of genera, with strong granulation. Ant. IV retractable bulb terminated with 5 sensory hairs thickened and a small sensilla between two of these special hairs. Ant. III with two small mallets within hairs guard fossa and two cylindrical and curved inward (Fig. 3a). antennal I and II without distinct hairs, with increased granularity and decrease the number of hairs from previous. PAO structure very close to the eye within a simple structure with three lobes (Fig. 3b). Unguis short, without lateral or internal teeth. Empodium present (Fig. 3d). Ventral tube with 4 +4

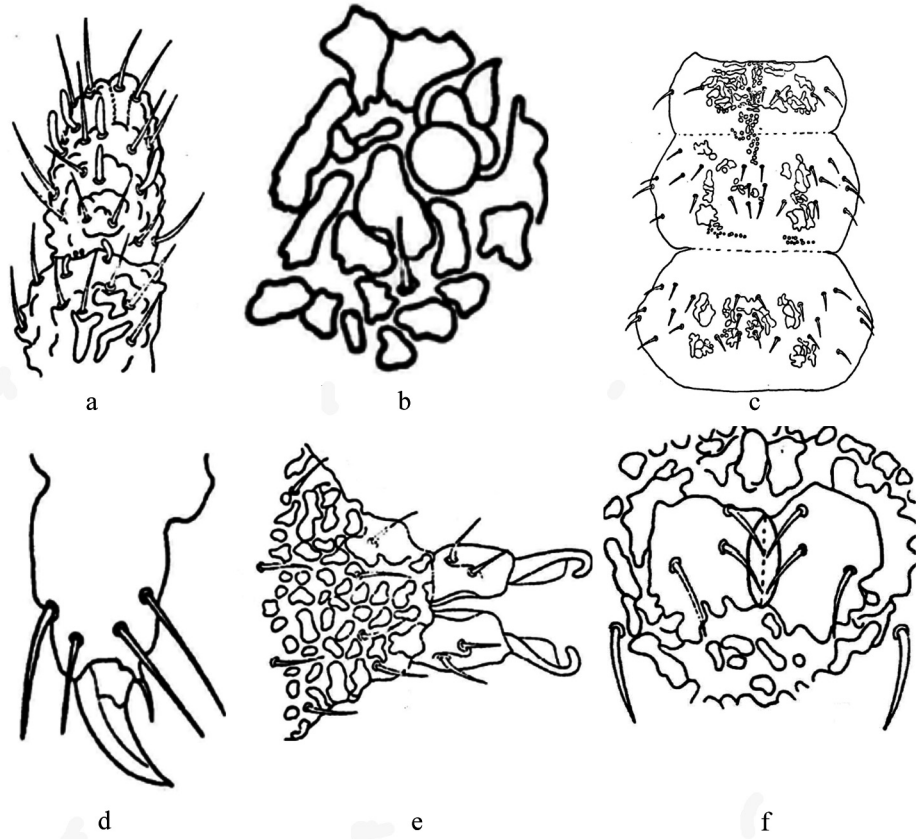

Fig. 3: ***Axenyllodes monoculatus*****. a) Ant. III and IV. b) PAO and simple eye. c) general aspect of thorasis segments. d) tibiotarsus and unguis. e) furca and f) venteral tube (JORDANA & ARDANAZ 1981)**

hairs, 3 +3 in the central and 1 +1 lateral and external (Fig. 3f). tenaculum with 2 +2 teeth. Manubrium with strong granulation; dens with 2 +2 hairs and finer granularity; mucro hook-shaped and approximately equal to the dens longitude with a thin inner sheet (Fig. 3e). Terminal and conical anal spines on papillae (JORDANA & ARDANAZ 1981).

Axenyllodes bayeri (Kseneman, 1935) Family: **Odentellidae**

Examined material: 5 exx, soil and leaf litter under elm trees (*Ulmus* spp.), Avarzaman area, Nahavand county, Hamadan, Iran. May, 2014.

Distribution: A common species in European region (JORDANA 1997). In Iran this species is reported by COX (1982).

Description: Body without pigment. Tegumentary granulation developed polygonal granules with rounded corners. Setae sub-equal, smooth, pointed. Antennal segments I, II, III, with 7, 10 and 14 regular setae. Sensory organ of antennal III with five knuckle typical sensilla. Antennal IV knuckle with six thickened sensilla. Tibiotarsus I, II, III with 10,10,9 pointed setae. Unguis with no internal or lateral tooth. Empodium present and pointed. Ventral tube with three pairs of setae; retinaculum with two teeth on each arm. Dens with two setae. Mucro hook-shaped, almost same size as dens. Manubrium with eight pairs of dorsal setae. Abd. VI with a pair of short anal spines (JORDANA 1997).

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Additional records for Iranian Collembola (Hexapoda: Entognatha) fauna from Tehran province

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Qazi, F. & Shayanmehr, M.: *Additional records for Iranian Collembola (Hexapoda: Entognatha) fauna from Tehran province.*
Abstract: In this study, the genus of *Triacanthella* Schäffer, 1897 and the species *Triacanthella intermedia* (Dunger and Zivadinovic, 1984) report for the first time for Iranian fauna. Additionally, the species *Ceratophysella stercoraria* (Stach, 1963), *Hypogastrura vernalis* (Carl, 1901), *Hypogastrura manubrialis* (Tullberg, 1869), *Orthonychiurus* cf. *folsomi* (Schaffer, 1900), *Folsomides parvalus* (Stach, 1922), *Folsomia penicula* (Bagnall, 1939), *Entomobrya lindbergi* (Stach, 1960), *Pseudosinella octopunctata* (Boerner, 1901), *Heteromurus major* (Moniez, 1889) and *Cyphoderus albinus* (Nicolet, 1842) were identified for the first time from Tehran province. The specimens were extracted by Berlese funnel from soil and leaf litter or were caught by pitfall traps.

Keywords: Collembola, Fuana, Berlese funnel, Iran, Tehran.

Introduction

Collembola is concluding one of the oldest groups of Arthropoda (Rapoport 1971). Collembola are as representatives of soil faunal diversity (Cassagne et al. 2003) and play a main role in nutrient cycle, analysis of organic matter and soil establishment; regulation of fungal populations; organizing relation with mycorhizae; bacteria colonization and all basic features in the functioning of forest ecosystems (Visser et al. 1981, Warnock et al. 1982, Faber 1992, Bardgett et al. 1998, Gange 2000, Cassagne et al. 2003, Kumssa et al. 2004). The variety of collembolan species are influenced by many sights of the soil such as pH, aeration, organic matter combination, nutrient, humus type, vegetation covering and the physical characteristics of the soil (Oliveira 1993, Salomon et al. 2004, Cole et al. 2005). The richness of native species is exclusively susceptible to environmental disorder and forest substitute, many species are non-native (Deharveng 1996). All of these characteristics suggest the emphasis of Collembola as ecological indicators of environmental quality (Huhta et al. 1967, Hole 1981, Faber 1992, Oliveira 1993, Detsis et al., 2000, Cassagne et al., 2003). Studies about these cute creators are obsolete in many parts of Iran. The first record of springtails in Iran was made by Farahbakhsh (1961) who described species *Sminthurus viridis* Linnaeus, 1758 from wheat and alfalfa fields in southern Iran. Cox (1982) described 70 species from

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northern, western and central provinces of Iran. Recently, some researchers have studied the biodiversity of springtails locally (MORAVVE et al. 2007, NEMATOLLAHI et al. 2009, YAHYAPOUR 2012, KAHRARIAN et al., 2012, DAGHIGHI 2012). SHAYANMEHR et al. (2013) prepared a checklist of Iranian Collembola which includes 116 species belonging to 18 families and 51 genera. YOOSEFI LAFOORAKI and SHAYANMEHR (2013) found a new genus and eight new species for Iran from Mazandaran province. YOOSEFI LAFOORAKI and SHAYANMEHR (2014) recorded a new genus and three new species of order Neelipleona for Iran. KAHRARIAN et al. (2014) reported 10 species of Entomobriydae from Kermanshah province.

Material and methods

Species were collected from Tehran region during 2013-2014. Tehran province is the capital of Iran, located on the southern slope of the Alborz Mountains. The specimens were collected in two ways. Some of them were caught by pitfall traps and majority of specimens were extracted from soil, leaf litter and moss by Berlese funnel. The specimens were collected from different habitats. They were preserved in 85% alcohol and then cleared in potassium hydroxide (KOH) for 3-5 minutes that depends on the pigmentation of the specimen. They fixed on the Hoyer medium for preparing microscopic slides. Then were observed using a phase contrast microscope and identified by identification keys.

Results

Assembled of eleven species of Collembola belonging to four families were collected and identified from Iran. The information on prepared species is introduced in Table 1. The genus *Triacanthella* and the species, *T. intermedia* (Dunger & Zivadinovic, 1984) is new for Iranian fauna. Also *Hypogastrura vernalis* (Carl, 1901), *Hypogastrura manubrialis* (Tullberg, 1869), *Ceratophysella stercoraria* (Stach, 1963), *Folsomia penicula* (Bagnall, 1939), *Folsomides parvalus* (Stach, 1922), *Entomobrya lindbergi* (Stach, 1960), *Pseudosinella octopunctata* (Boerner, 1901), *Heteromurus major* (Moniez, 1889), *Cyphoderus albinus* (Nicolet, 1842), *Orthonychiurus* cf. *folsomi* (Schaffer, 1900) are recorded for the first time from Tehran province.

Taxonomic descriptions

Ceratophysella stercoraria (Stach, 1963) Family: ***Hypogastruridae***

Material examined: 5 specimens, Tehran, Forest park of Kuhsar, in leaf litter andsoil, 15 February 2013.

Description: size 1.5 mm in famales, 1.3 mm in males. Colour of the body spotted brownish-violet, paler ventrally. Granulation strong, especially on two last abdominal terga. The middle of abdominal tergum 5 between setae there is a strongly granulated, semicircular swelling of variable size which is slightly protruded beyond hind margin of tergum. Body hairs moderately long, finely serrated, macrochaetae well differentiated, sensilla comparatively long. Ocelli 8 + 8. PAO (post antennal organ) about 2.5-3 times larger than ocelli, with 4 lobes of which the anterior pair larger than the posterior.

Table 1. Information on eleven new species recorded from Tehran province (Iran)

Species	Location	Date	Habitat	Coordinate	Altitude (m)	Identified by
Triacanthella intermedia (Dunger & Zivadinovic, 1984)	Tehran, Forest park of Kuhsar	2/22/ 2013	Soil, Leaf litter	35° 45′ N 51° 33′ E	1496	Dariusz Skarzynski
Ceratophysella stercoraria (Stach, 1963)	Tehran, Forest park of Kuhsar	2/15/ 2013	Soil	35° 45′ N 51° 33′ E	1496	Dariusz Skarzynski
Hypogastrura vernalis (Carl, 1901)	Tehran, Forest park Pardisan	4/5/ 2013	Soil	35° 45′ N 51° 37′ E	1425	Dariusz Skarzynski
Hypogastrura manubrialis (Tullberg, 1869)	Tehran, Forest park Pardisan	4/5/ 2013	Soil, Leaf litter	35° 45′ N 51° 37′ E	1425	Dariusz Skarzynski
Folsomides parvalus (Stach, 1922)	Tehran, Forest park Kuhsar	2/15/ 2013	Soil (*Morus* sp.), Leaf litter	35° 45′ N 51° 33′ E	1496	Masoumeh Shayanmehr
Folsomia penicula (Bagnall, 1939)	Tehran, Forest park Kuhsar	2/15/ 2013	Soil (*Quercus* sp.)	35° 45′ N 51° 33′ E	1496	Masoumeh Shayanmehr
Entomobrya lindbergi (Stach, 1960)	Tehran, Islam Shahr, farm	5/21/ 2014	Soil (*Alnus* sp. and *Ulmus* sp.)	35° 33′ N 51° 14′ E	1072	Masoumeh Shayanmehr
Pseudosinella octopunctata (Boerner, 1901)	Tehran, Northwest Mountains	2/22/ 2013	Soil, Leaf litter	35° 46′ N 51° 18′ E	1636	Masoumeh Shayanmehr
Heteromurus major (Moniez, 1889)	Shahriyar, farm	7/11/ 2013	Soil, Leaf litter	35° 39′ N 51° 03′ E	1162	Masoumeh Shayanmehr
Cyphoderus albinus (Nicolet, 1842)	Tehran, Forest park Kuhsar	2/18/ 2013	Soil (*Platanus* sp.)	35° 45′ N 51° 33′ E	1496	Masoumeh Shayanmehr
Orthonychiurus cf. *folsomi* (Schaffer, 1900)	Tehran, Bahar park	4/15/ 2013	Leaf litter	35° 45′ N 51° 18′ E	1463	Igor Kaprus

Labrum with 4-5 setae and 4 prelabral setae. Tibiotarsi 1-3 with 19, 19, 18 setae. Tibiotarsal tenent hairs distinctly shorter than claws and acuminate. Claws with distinct inner tooth and two pairs of weak lateral teeth. Empodium appendage with broad basal lamella and apical filament reaching middle of inner unguis. Ventral tube with 4 + 4 setae. Retinaculum with 4 + 4 teeth. Furca fully developed. Dens with uniform granulation and 7 setae (2 subapical on inner side are thicker than others). Mucro typical for the denticulate group. Dens two times longer than mucro. Anal spines long (= claws 3), curved and inserted on high papillae (SKARZYNSKI 2000).

Hypogastrura manubrialis (Tullberg, 1869) Family: ***Hypogastruridae***

Material examined: 11 specimens, Tehran, Forest park of Pardisan,soil and leaf litter, 5 April 2013.

Description: Body size 1.5 mm. color grayish or redish blue of variable intensity. PAO with 4 subequal lobes, each with a secondary projecting lobe. In maxilla lam.6 only with marginal ciliation and apex of lam.1 fan-shaped with two rows of delicate ciliation which appear to be composed of bundles with 2-5 filaments in each. Ant.1 with 7 setae. Ant.3 organ simple, without additional spines. Ant.4 with about 10 curved sensilla. Apical bulb simple or weakly lobed at tip. Body hairs short and fine, uniform. Macrochaetae not developed. Largest setae slightly serrate. Integument with fine granules uniform. Anal spines short and straight. Retinaculum with 4+4 teeth. Dens with 7

dorsal setae, about 2.0-2.5 time as long as mucro which is elongate with a narrow dorsal lamella. Tibiotarsi with a single tenent hair, which is weakly clavate. Claws with an inner tooth lateral teeth indistinct. Unguiculus without basal lamella, reaching middle of unguis (FJELLBERG 1998).

Hypogastrura vernalis (Carl, 1901) Family: ***Hypogastruridae***
Material examined: In high density, Tehran, Forest park Pardisan, soil, 5 April 2013.

Description: Size 1.2 mm, color dark bluish-red. Post antennal organ with 4 slightly irregular lobes, a little larger than an ocellus. Lamella1 with 2 fan-shaped rows of cilia at apex, shaft with some coarse denticles near base in addition to a bundle of stiff filaments projecting towards the space behind the three maxillary teeth (tooth-brush). Antenna 1 with 7 setae. Antenna 3 organ simple, without additional spines. Antenna With simple apical bulb and 6-7 curved sensilla which are only slightly thicker than other antennal setae. Body hairs short, uniform, rather thick, distinctly serrate. Macrochaetae not developed. Body integument with fine, uniform granulation. Anal spines short, straight, as long as their basal papillae. Retinaculum with 4+4 teeth. Dorsal side of dens with 7 setae and tubercles which become enlarged towards apex. Mucro characteristic, with a plug-shaped tip and a large, angular dorsal lamella. Tibiotarsi with one clavate tenent hair. Claws with distinct inner tooth, lateral teeth present. Unguiculus reaching slightly beyond inner tooth of unguis, with broad basal lamella (FJELLBERG 1998).

Orthonychiurus cf. ***folsomi*** (Schaffer, 1900) Family: ***Onychiuridae***
Material examined: In high density, Tehran, Bahar Park, leaf litter, 5 April 2013.

Description: Size 1.3-1.7. Color white. PAO with compound vesicles in narrow arrangement Ps.oc.d.: 32/022/33342. Ps.oc.v.:3/000/11(0-1)1. Nt.3 organ with 4 papillae, 2rods and 2 sensory clubs which are smooth with one longitudinal rib.

Pseudosinella octopunctata (Borner, 1901) Family: ***Entomobryidae***
Material examined: 6 specimens, Tehran, Bahar Park, soil and leaf litter, 22 February 2013.

Description: Body size up to 1.1 mm. Color white, with diffuse bluish grey pigment on antennae and dorsal and ventral side of head, body with scattered brownish red pigment. Ocelli 4+4, set on square eye-spot. Maxillary outer lobe with 3 sublobal hairs and a small spine. Head with both macrochaetae S and T present. Trichobothrial microsetae all slim and smooth, also on third abdomen segment. Segment 4 of abdomen with 3+3 macrochaetae in the median field. Setae of the trichobothrial fields smooth, except one. Claws narrow, with small paired inner teeth, posterior slightly larger and more distal than anterior. Lateral teeth small, set beyond middle of unguis. Unguiculus narrow laneceolate, without distinct teeth (FJELLBERG 2007).

Entomobrya lindbergi (Stach, 1960) Family: ***Entomobryida***
Material examined: In high density, Islam Shahr, farm, soil, 21 April 2014.

Description: Body length up to 2-3 mm excluding antennae, according to STACH (1963). Body color pattern is as long strip in lateral side. Head: antennal length 1039 μm, 2-3 times the length of the head, Ant IV with bilobed apical vesicle. Relative length of Ant I/II/III/IV = 1.5/3/2.7/3.3.4 labral papillae wrinkled or with some projections. 8

Ommatidium. Length ratio of Abd IV/III<4. Claw with 4 teeth on internal edge: first pair at 50% distance from base of claw, and 2 unpaired teeth, first one at 75% distance from base and the most distal one minute. Dorsal tooth basal. Empodium spike-like, with smooth external edge on leg III. Furca length 900 μm. Manubrial plate with 3-5 chaetae and 2 psp. Mucro with 2 teeth, anteroapical tooth bigger than the apical one. Mucronal spine present (JORDANA 2012).

Heteromurus major (Moniez, 1889) Family: ***Entomobryidae***
Material examined: 4 specimense, Shahriyar, soil, 21 June 2013.

Description: Length up to 3.0 mm, generally up to 2.5 mm. Coloration variable. Typical pattern composed of pigment distributed throughout antennae (more conspicuous on Ant 3-5), anterior and lateral portions of head, anterior ⅓ of mesonotum, lateral margins of thorax 2, Abdomen 1, and throughout legs, especially on femora and tibiotarsi. Light pigment sometimes along borders of body segments. Lighter and darker individuals, as well as all intergrades, may occur sympatrically. Antennae about 0.4 lengths of head and body combined. Eyes 8&8 on dark patches. Labral papillae absent (YAHYAPOUR 2012).

Folsomides parvalus (Stach, 1922) Family: ***Isotomidae***
Material examined: 30 specimens, Forest park Kuhsar, Soil, 15 February 2013.

Description: Body shape very long and tubular, size up to 0.9 mm. Abdomen, segments 5-6 prolonged. Post antennal organ narrow elongate. Ocelli 2+2. White, dark spots only under the ocelli. Macrochaetae well developed, also on anterior abdominal segments. Lower two pairs of sensilla on abdomen, segment 5 not thicker than upper pairs. The upper segment 4 sensillum set close to the macrochaetae. Retinaculum with 3+3 teeth, no setae. Furca with long and slender dens which has only 3 dorsal setae, no ventral. Mucro with two teeth. Only females are seen (FJELBERG 2007).

Folsomia penicula (Bagnall, 1939) Family: ***Isotomidae***
Material examined: 30 specimens, Forest park Kuhsar, Soil, 15 February 2013.

Description: Size 1.6 mm. colour whitish with a spotted black pigmentation scattered all over body, eye-spots distinct body slender, cylindrical. Ocelli 2+2,but posterior pair small. PAO narrow, slightly longer than width of ant.1. Ventral side of ant.1 with two apical and one basal microsensilla, dorsal side with two. Ant.2 with a setaseous lateroapical sensillum and two basal (ventra/dorsal) microsensilla. Ant.3 in lateroapical position with aspine like sensillum only. Ant.4 with 4-5 slightly thickenened curved sensilla. Prelabral setae 4. Head with 4+4 postlabial setae. Microsensilla on th.2-abd.3 distributed as 11/111. Upper macrosensilla on abd.1-3 in mid-tergal position. Thorax without ventral setae. Ventral tube with 5+5 distal and 6-7 posterior setae. Claws with a pair of lateral teeth near base, unguiculus only half as long as inner edge of claw. Manubrium with 15-20 anterior setae, 3+3 in apical rows. Dense with 4 posterior setae (FJELBERG 2007).

Cyphoderus albinus (Nicolet, 1842) Family: ***Cyphoderidae***
Material examined: 30 specimens, Forest Park Kuhsar, soil, 18 February 2013.

Description: Body size 1.6 mm. White, eyes absent. Body shaped flattened, broad. Sides of thorax 2-3 roof like flattened, hiding bases of legs. Thin transparent scales are

present on dorsal side of head and body, including legs, two basal segments of antennae and ventral side of dens. Antennae about 2.5 as long as head diagonal. Antennae 1 with 7-8 ventral and 3 dorsal (at Antennae 3 organ inconspicuous, with small apical sensilla and guards. Antennae 2-3 with a short, triangular spin like sensillum in mid-ventral position. Antennae 4 has a short club-shaped subapical organ. Labrum with 4/554 smooth setae, two setae of the mid-row stronger than others. Labral edge unmodified. Frontoclypeal field with 4+5 setae, of which the posterior 5 are ciliated. Labial palps with a normal papillary complex, with proximal setae. Papilla E with 4 guards. Basal fields with 4 median and 5 lateral setae. Maxillary palp simple, sublobal hairs absent. Maxilla with 3-toothed capitulum and a fused pad-shaped lamellary complex which is not easily interpreted. Tip of longest lamella reaches beyond capitulate teeth. Top of head with 1+1 long trichobothria. Haed with 3+3 postlabial setae. Thorax and abdomen with macrochaetae and ciliated setae only along sides, not on dorsal disc. Mesothorax with a row of short, spin-like setae along anterior edge. Ventral tube with 2+2 long anterior setae, 2+2 short distal and 6-7 posterior setae of which three are longer than others. Retinaculum with 4+4 teeth and one setae. Coxal parts of mid-legs with 2-3 particularly strong macrochaetae. Claws slender, apically expended, unguis with a long needle-like basal tooth on the back side, inner edge with a small subapical tooth. Unguiculus with a strong, wing-like ventral tooth. Trochanteral organ of last leg V-shaped, with about 10 setae. Manubrium with a differentiated cover of dorsal ciliate setae, in particular the 3+3 lateral macrochaetae in distal half are distinct. Dens dorsally with double rows in a single row of 4 ciliate macrochaetae. Proximal part with 3 setae, of which one is smooth. Ventral side of dens with many hyaline scales. Mucro elongate, almost half as long as dens, with two apical teeth (FJELLBERG 2007).

Discussion

The genus *Triacanthella* and the species *T. intermedia* are recorded for the first time from Iran. *Hypogastrura vernalis* is recorded from Tehran province for the first time. It was reported before from Kohgiluyeh and Boyer Ahmad (FALAHATI et al. 2012) and Mazandaran YOOSEFI LAFOORAKI and SHAYANMEHR 2013). *Hypogastrura manubrialis* is recorded from Tehran for the first time. It was reported before from Central, Mazandaran, E. Azarbaijan, W. Azarbaijan, Zanjan provinces by COX (1982) and Kohgiluyeh and Boyer Ahmad province by FALAHATI et al (2012). *Ceratophysella stercoraria* is recorded from Tehran for the first time. It was reported before from province Kermanshah by KAHRARIAN et al. (2012) and Kohgiluyeh and Boyer Ahmad by FALAHATI (et al., 2012). *Folsomia penicula* is new for Tehran province. It was reported previously from Central Mazandaran, E. Azarbaijan, W. Azarbaijan, Golestan and Gilan provinces (COX 1982, FALAHATI et al., 2013, DAGHIGHI 2012). *Folsomides parvalus* is new for Tehran. It was reported before from Central, Mazandaran, Gilan, E. Azarbaijan, W. Azarbaijan and Kermanshah provinces (COX 1982, DAGHIGHI 2012, YAHYAPOUR 2012, KAHRARIAN et al. 2012).

Also *Entomobrya lindbergi* was reported before from Tehran province by MORAVVEJ et al. (2007). *Pseudosinella octopunctata* is reported for Tehran province for the first time. It was reported before from Central, Mazandaran, Gilan, E. Azarbaijan, W. Azarbaijan, Zanjan provinces by COX (1982) and Mazandaran/Sari by YAHYAPOUR (2012). *Heteromurus major* is recorded from Tehran for the first time. It was reported before from Central, Mazandaran, Gilan, E. Azarbaijan and Gilan provinces (COX 1982;

Daghighi 2012, Yahyapour 2012). *Cyphoderus albinus* is recorded from Tehran for the first time. It was recorded before from Gilan province by Daghighi (2012). *Orthonychiurus folsomi* is recorded from Tehran for the first time. It was reported before from Mazandaran/Sari by Yahyapour (2012).

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First report of the genus and species *Cephalothrips monilicornis* (Reuter) (Thysanoptera: Phlaeothripidae) from Doha, Qatar

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Mirab-Balou, M. & Zaidi, F.: *First report of the genus and species Cephalothrips monilicornis (Reuter) (Thysanoptera: Phlaeothripidae) from Doha, Qatar.*
Abstract: The genus *Cephalothrips* Uzel (Thysanoptera: Phlaeothripidae) with eight species in the world, is one the small group in subfamily Phlaeothripinae. Here, *Cephalothrips monilicornis* (Reuter, 1880) is reported for the first time from Doha, Qatar. Diagnostic morphological characters and geographical distribution of the newly recorded species are briefly discussed. The specimens examined are deposited in the collection of Department of Plant Protection, College of Agriculture, Ilam University, Iran (ILAMU).

Keywords: Phlaeothripinae, Cephalothrips, new record, Qatar.

Introduction

The Thysanoptera with more than 6000 known species is one of the orders of insects distributed throughout the world. This order includes nine families for living species (plus three fossil families) belonging to two suborders: Terebrantia and Tubulifera. The family Phlaeothripidae is the only family in suborder Tubulifera. This family currently comprises about 3500 known species in the world. Recently, Mirab-Balou et al. (2014) listed four genera and nine species of thrips from Doha, Qatar, of which one of them is belonging to subfamily Phlaeothripinae. Here, the second genus of Phlaeothripinae is reported for this country for the first time.

The genus *Cephalothrips* was originally established by Uzel (1895), with *Phloeothrips monilicornis* Reuter as its type species (Cott 1956, Stannard 1968). Eight species are included in the genus now (Table 1) (Watson 1926, zur Strassen, 1968) and here is recorded for Qatar for the first time. The type species *Phloeothrips monilicornis*, was known distribute in Iran, Europe, North America, China and Siberia (Cott 1956, zur Strassen 1967, Stannard, 1968, Cao and Feng 2011, Mirab-Balou 2013).

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Materials and methods

Specimens were collected from Doha, Qatar, in 2013. The specimens mounted on slide using the method of Mirab-Balou and Chen (2010). All descriptions, measurements and photos were made with a Leica DM IRB microscope, a Leica MZ APO microscope with a Leica Image 1000 system, EVOS digital inverted microscope and a Nikon Y-IDT microscope with a Q-image CCD. The specimens are deposited in the collection of Department of Plant Protection, College of Agriculture, Ilam University, Iran (ILAMU).

Table 1. Checklist of *Cephalothrips* species in the world

albostriatus zur Strassen	Morocco
brachychaitus Han	China
coxalis Bagnall	Iran, France
fuscus Faure	South Africa
hesperus Hood	USA
longicapitus Borzykh	Kyrgyzstan
merrilli Watson	Cuba
monilicornis (Reuter)	Qatar, Iran, Russia, China, Europe, North America

Results

Suborder Tubulifera
Family Phlaeothripidae
Genus Cephalothrips Uzel
Cephalothrips Uzel 1895: 244. Type species *Phloeothrips monilicornis* Reuter 1885.

Diagnosis: Macropterous, micropterous or apterous. Small size, smooth, usually with eyes extending ventrally, with pedicel of antennal segment VII broad, without praepectal plates. Head about one and one-third times longer than broad, broadest at about middle of cheeks, generally smooth, weakly transversely striate; often ventral portion of eyes posteriorly elongated to a point. Ocelli present only in macropterous forms. Antennae short, 8-segmented, segments VII and VIII each with broad pedicels. Mouth-cone broadly rounded; maxillary stylets sigmoidal, retracted far into the head, not touching in the center of the head. Pronotum weakly developed, about one and one-half times broader than median length, about two-thirds the head length, without a median longitudinal thickening. All major setae present. Wings when fully developed not greatly swollen basally, parallel-sided, sparsely fringed. Legs short; anterior femora slightly swollen in females, more so in males, femora and tibiae unarmed; fore tarsi with a short, sharp tooth on the inner surface. Ferna present, small, trapezoidal. Abdomen not enlarged, with any lateral processes in either sex, lateral setae not set on produced posterior angles of their respective segments. Tube short, about two-thirds head, anal setae shorter than tube.

Cephalothrips monilicornis (Reuter)
Phloeothrips monilicornis Reuter, 1880.
(Figures 1-5)

Material examined: Qatar, Doha: 3 females, Rumeilah Park, from grasses (Poaceae), 27.viii.2013, Leg. M. Mirab-balou, (in ILAMU).

Diagnosis: Female apterous (Fig. 1). Body and legs brown; all tarsi and apex of all tibiae light yellow (Fig. 4); antennal segments I–II and VII–VIII dark brown, III pale brown, IV–VI pale brown with yellow in basal half (Fig. 2).

Head distinctly longer than wide (about 1.3 times), with eyes large and prolonged posteriorly on ventral surface; postocular setae small, wide apart; maxillary stylets retracted to postocular setae; postocular setae short, blunted at apex; postocellar setae small, pointed at apex; ocelli absent (Fig. 3). Mouth cone short and rounded. Antennae 8-segmented, segment III with one sensorium, IV with two sensorial.

Pronotum with only two pairs of major setae, epimerals weakly capitate, posteroangulars blunt at apex; prosternal basantra absent. Metanotum without sculpture. Mesopraeosternum eroded medially into two triangles. Fore tarsus with small pointed tooth. Fore wings parallel and without duplicated cilia in macropterous form.

Pelta D-shaped, with a pair of campaniform sensilla (Fig. 5). Abdominal tergites II–VII with weak wing retaining setae; tergite IX setae S1 and S2 weakly capitate, shorter than basal width of tube; anal setae shorter than tube.

Female macroptera: Color and structure similar to apterous female. But ocelli present; fore wings without duplicated cilia, sub-basal wing setae short; metanotum with longitudinal reticulation laterally.

Measurements in *μm* (width): Body ♀ 2200(395). Head 260(210); distance between compound eyes 90. Pronotum 160(280). Tube 140(78), setae S1 60, S2 60, S3 60. Antennal segments I–VIII as follows: I 45(40), II 54(36), III 52(33), IV 57(36), V 54(34), VI 51(31), VII 44(26), and VIII 36(16).

Distribution: Iran, China, Siberia, Europe, North America, new record for Qatar.

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Figures 1-5. ***Cephalothrips monilicornis*****. (1) Female, apterous; (2) Antenna; (3) Head; (4) Fore leg; (5) Meso- and metanotum and pelta**

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The true bug (Heteroptera: Nepomorpha, Gerromorpha) fauna of some soda pans and sodic water bodies of Great Hungarian Plain

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Cozma N. J., Juhász P., Müller Z., Olajos P. & Kiss B: *The true bug (Heteroptera: Nepomorpha, Gerromorpha) fauna of some soda pans and sodic water bodies of Great Hungarian Plain.*
Abstract: Between 1997 and 2010, altogether 26 aquatic and semiaquatic bug species were collected at 29 localities in Hungary. The collected species belonged to 9 families (Nepidae: 2 species, Corixidae:11, Naucoridae: 1, Notonectidae: 2, Pleidae: 1, Mesoveliidae: 1, Hydrometridae: 1, Veliidae: 1 and Gerridae: 6). This paper presents 233 records of occurrences. The most wide-spread 6 species in the natural or semi-natural soda pans were *Sigara lateralis, Paracorixa concinna, Cymatia rogenhoferi, Sigara striata, Corixa affinis* and *Gerris odontogaster*.

Keywords: water bugs, faunistical investigation, alkaline water, saline water, Hungary

Introduction

The number of sodic aquatic habitats decreased drastically mainly due to climatic changes and former human disturbance, primarily drainage, flood control, and irrigation (Boros and Bíró 1999). The registration of the "*ex lege*" protected soda pans and sodic waters was carried out between 1998 and 2005, with the mapping of sodic water bodies covering 2342 ha, without the Lake Fertő and Lake Velencei (Boros et al. 2006). In Hungary, 317 existing soda pans and sodic waters have been registered until 2002 (20 365 hectar) (Magyar Közlöny 2009) but the number of natural and semi-natural soda pans is less than hundred in the Carpathian Basin (Horváth et al. 2013). Considering different geological, botanical, zoological aspects of these habitats, they are unique in our country. The biota is dominated by ubiquist species which have an extended tolerance towards salinity and pH (euryhydrion), with some other species which are either specialised for sodic water (natronophil) or are alkaline-tolerant (alkalinophil) (Horváth et al. 2014).

The composition of the aquatic macroscopic invertebrate fauna was investigated by many researchers. The zoobenthos was studied by Andrikovics (2001), Andrikovics and Murányi (2003), Ferencz (1965, 1967, 1970, 1973) and Megyeri (1979). Leeches of the soda lakes were investigated by Győrffy (1931) and Stiller (1942), while

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CSÁNYI et al. (1988), HORVÁTH (1950), RICHNOVSZKY (1970, 1977), RICHNOVSZKY et al. (1978), as well as SZABÓ (1980, 1990, 1993) studied molluscs. The most tipical sodic beetles – *Berosus fulvus, Berosus spinosus, Enochrus bicolor, Enochrus hamifer* – were explored in the southern part of the Great Hungarian Plain by CSABAI and MÓRA (2003) and CSABAI et al. (2010). The typical dragonfly fauna in soda pans and sodic waters is mainly composed of *Lestes* and *Sympetrum* species. The most representative sodic species are *Lestes macrostigma, L. barbarus, L. sponsa, L. dryas, Sympetrum fonscolombii, S. meridionale* and *S. sanguineum*. Additionally, *Ischnura pumilio, Ischnura elegans pontica, Orthetrum albistylum*, rarely *Hemianax ephipigger* and other species with wide salinity tolerance can be observed (AMBRUS et al. 1996a, 1996b, 1998, OLAJOS et al. 1998). The knowledge on the Odonata fauna of soda pans has been expanded by Juhász et al. (1998a) and KISS et al. (2001) during the study of organisms among vegetation.

The exploration of the bug fauna of these habitats began with intensive research on the Lake Fertő (HORVÁTH 1923, MOLDOVÁNYI 1977). BAKONYI and VÁSÁRHELYI (1981, 1987) conducted faunistic surveys in the areas of Hortobágy and Kiskunság. Scattered data on the Heteroptera fauna of sodic waters in the region of Tiszántúl can be found in studies by CSONGOR (1956), DOSZTÁL (1974), JUHÁSZ et al. (1998b) and KISS et al. (1999a). According to these studies, semiaquatic bugs (*Gerromorpha*) are represented by *Mesovelia furcata, Microvelia reticulata* and some *Gerris* species in sodic waters. The most characteristic and dominant sodic aquatic bugs (Nepomorpha) are *Paracorixa concinna* and *Cymatia rogenhoferi*. Other very abundant species in these water bodies are *Sigara lateralis* and *Corixa affinis* (BAKONYI and VÁSÁRHELYI 1987, BOROS 1999, CSABAI et al. 2010, JUHÁSZ et al. 1998a,b, KISS et al. 2001, PETRI et al. 2012, SOÓS 1963).

This paper aims to present the true bug fauna of some soda pans and sodic water bodies in the Great Hungarian Plain.

Material and methods

Studied water bodies

Soda pans are a special type of inland athalassohaline waters (HAMMER 1986). These shallow and astatic habitats are characterized by large fluctuations of water level and high levels of conductivity coupled with high alkalinity in the lowland parts of the Carpathian Basin. A pan can be regarded as natural or semi-natural if it was not strongly disturbed by human activities and it was of natural origin or constructed in the former decades (HORVÁTH et al. 2014).

Faunistic data was gathered countrywide from 29 soda pans and sodic water bodies at 474 sampling events (Table 1). Localities were mainly selected based on a soda pan survey in 2010–2011 (Emil Boros, personal communication, HORVÁTH et al. 2013). Most samples were collected from four typical soda pans (Böddi-szék, Kelemen-szék, Büdös-szék (Szabadszállás) and Zab-szék) and one macrophyte-dominated soda pan (Fehér-szék) in Kiskunság. These water bodies were sampled regularly for several years.

Sampling

Heteropterans were sampled in 1997–2001, 2004–2005, 2007–2008, as well as in 2010 (Table 2).

The faunistic sampling was conducted by hand netting with a pond net (0.25×0.25 m^2, mesh size 0.95 mm) in 1997, 1998, 1999, 2000, 2001, 2004, 2005. Quantitative sampling

was (*i*) based on the AQEM protocol (HERING et al. 2003, 2004) conducted in the frame of the ECOSURV project in 2005 (Ecosurv 2005, KISS et al. 2006), or (*ii*) conducted based on the NBmS (National Biodiversity-monitoring System) methodology (based on AQEM protocol) between 2007 and 2008 (JUHÁSZ et al. 2009). The third method for quantitative sampling was (*iii*) the "monolith" method in 1999, 2000, 2001 and 2010. Here we used a sampling cylinder with 0.45 m diameter, and we caught all individuals in this cylinder with the pond net. Samples were preserved in 70% ethanol.

The collected individuals were identified using keys and description by SOÓS (1963), BENEDEK (1969), JANSSON (1986) and SAVAGE (1989). The identification of *Corixidae* and *Gerridae* larvae was carried out based on the description of JANSSON (1969), VEPSÄLÄINEN and KRAJEWSKI (1986). The nomenclature follows the Palearctic Heteroptera Catalouge (AUKEMA and RIEGER 1995).

Table 1: Sampling sites with 10×10 km UTM grid codes and the number of sampling events

Site	Name of locality	Administrativ unit	UTM	No. of sampling
1	Bába-szék	Dunatetétlen	CS57	4
2	Bocskoros-szik	Derecske	ET34	2
3	Bogárzó	Solt	CS58	2
4	Böddi-szék	Dunatetétlen	CS58	47
5	Büdös-szék	Pusztaszer	DS25	3
6	Büdös-szék	Szabadszállás	CS69	44
7	Fehér-szék	Fülöpszállás	CS68	73
8	Fehér-szik	Tiszavasvári	EU31	1
9	Fehér-tó	Hosszúpályi	ET54	2
10	Fekete-szik	Derecske	ET44	2
11	Kakasszékhalmi-mocsár	Székkutas	DS65	3
12	Kakasszéki-tó	Székkutas	DS65	3
13	Kápolnás-tó	Királyhegyes	DS72	4
14	Kardoskúti Fehér-tó	Kardoskút	DS74	8
15	Kelemen-szék	Fülöpszállás	CS68	133
16	Kerek-szik	Konyár	ET44	2
17	Kis-rét	Szabadszállás	CS69	2
18	Kis-sóstó	Orosháza	DS75	2
19	Liliomos	Királyhegyes	DS72	1
20	Nagy-szik	Balmazújváros	ET27	7
21	Nagy-vadas-tó	Újfehértó	EU40	2
22	Ősze-szék	Balástya	DS23	2
23	Partos-széki-anyaggödrök	Fülöpszállás	CS68	3
24	Peres-szik	Derecske	ET44	1
25	Sárkány-tó	Kaskantyú	CS77	1
26	Sós-tó	Csongrád	DS27	1
27	Szappan-szék	Fülöpháza	CS89	1
28	Zab-szék	Szabadszállás	CS68	116
29	Zab-széki tömpöly	Szabadszállás	CS68	1

Results and Discussion

Twenty-six aquatic and semiaquatic heteropteran species were recorded from 29 localities (see later and Table 2), which represent 45.6% of the Hungarian fauna. Based on our data and other quantitative data (JUHÁSZ et al. 1998a, KISS et al. 2001), the most wide-spread six species in the natural or semi-natural soda pans (site 1-10, 14-16, 18, 21-22, 24-26, 28-29) in rank order were: *Sigara lateralis, Paracorixa concinna, Cymatia rogenhoferi, Sigara striata, Corixa affinis* and *Gerris odontogaster*. True bug fauna of these habitats was dominated by halophilic, halotolerant and ubiquist species. Two water striders from Kelemen-szék, *Gerris lacustris* and *Limnoporus rufoscutellatus* are not typical in soda pans. The collected specimens were in macropterous form and we can strongly assume they only arrived in the pans by chance during dispersal. Furthermore, *Corixa panzeri, Cymatia coleoptrata, Ilyocoris cimicoides, Micronecta scholtzi* and *Ranatra linearis* were typical for the less characteristic soda pans (with low salinity, artificially modified water regime) with higher extent of vegetation (reed and submerged macrophytes) or for sodic marshes (site 12-13, 17, 19-20, 23).

C. rogenhoferi, P. concinna and *S. lateralis* were previously found in Bába-szék, Büdös-szék (Szabadszállás), Kelemen-szék and Zab-szék by Csabai et al. (2010) and PETRI et al. (2012). In addition to these species, *C. affinis, G. argentatus, Gerris odontogaster, G. thoracicus, Notonecta glauca, Plea minutissima* and *S. striata* were caught near to Kelemen-szék by light trap (BAKONYI and VÁSÁRHELYI 1987). According to these results, there is no considerable change in the species composition of the water bug fauna of Kelemen-szék in the last decades.

PETRI et al. (2012) found *Gerris lacustris, Micronecta scholtzi, Nepa cinerea* and *R. linearis* in Kakasszéki-tó between 2007 and 2011, suggesting that this habitat started to lose its sodic character. They also found *Hesperocorixa sahlbergi* which do not inhabit soda pans or sodic water bodies, as it normally lives in oxbow lakes or in mires (KISS et al. 2008), but it was found in the Lake Balaton (VÁSÁRHELYI and BAKONYI 2005) and in streams e.g. Széplaki-patak or Szentjakabi-patak (MÓRA et al. 2008). Since our sampling, a new notonectid species, *Anisops sardeus sardeus* Herrich-Schaeffer, 1849 was discovered in some sodic waters such as Büdös-szék (Pusztaszer), Kakasszéki-tó, Csikóspusztai-tó (Királyhegyes) and Nagy-Széksóstó (Mórahalom), but this species was also found in other water body types (oxbows, fish ponds, lowland canals), and therefore, it cannot be considered as a typical soda water species (SOÓS et al. 2010, PETRI et al. 2012).

List of Heteroptera species and their occurences

Aquarius paludum paludum (Fabricius, 1794) – Kelemen-szék

Corixa affinis Leach, 1817 – Bába-szék; Bocskoros-szik; Bogárzó; Böddi-szék; Büdös-szék (Pusztaszer); Büdös-szék (Szabadszállás); Fehér-szék; Kakasszékhalmi-mocsár; Kakasszéki-tó; Kápolnás-tó; Kardoskúti Fehér-tó; Kelemen-szék; Kis-rét; Kis-sóstó; Partos-széki-anyaggödrök; Szappan-szék; Zab-szék

Corixa panzeri (Fieber, 1848) – Kis-rét

Corixa punctata (Illiger, 1807) – Bába-szék; Bocskoros-szik; Bogárzó; Büdös-szék (Pusztaszer); Fehér-szék; Fehér-tó; Kakasszékhalmi-mocsár; Kakasszéki-tó; Kápolnás-tó; Kardoskúti Fehér-tó; Kis-rét; Kis-sóstó; Nagy-szik; Partos-széki-anyaggödrök; Szappan-szék

Cymatia coleoptrata (Fabricius, 1777) – Kardoskúti Fehér-tó; Kis-rét

Cymatia rogenhoferi (Fieber, 1864) – Bába-szék; Bocskoros-szik; Bogárzó; Böddi-szék; Büdös-szék (Pusztaszer); Büdös-szék (Szabadszállás); Fehér-szék; Fehér-tó; Kardoskúti Fehér-tó; Kelemen-szék; Kis-rét; Szappan-szék; Zab-szék; Zab-széki tömpöly

Gerris argentatus Schummel, 1832 – Büdös-szék (Szabadszállás); Fehér-szék; Kardoskúti Fehér-tó; Kelemen-szék; Kis-rét; Nagy-vadas-tó; Partos-széki-anyaggödrök; Zab-szék; Zab-széki tömpöly

Gerris lacustris (Linnaeus, 1758) – Kardoskúti Fehér-tó; Kelemen-szék

Gerris odontogaster (Zetterstedt, 1828) – Büdös-szék (Szabadszállás); Fehér-szék; Kakasszékhalmi-mocsár; Kakasszéki-tó; Kápolnás-tó; Kardoskúti Fehér-tó; Kelemen-szék; Kerek-szik; Kis-rét; Liliomos; Nagy-szik; Nagy-vadas-tó; Ősze-szék; Partos-széki-anyaggödrök; Zab-szék; Zab-széki tömpöly

Gerris thoracicus Schummel, 1832 – Böddi-szék; Büdös-szék (Szabadszállás); Fehér-szék; Fekete-szik; Kakasszékhalmi-mocsár; Kardoskúti Fehér-tó; Kelemen-szék; Kerek-szik; Zab-szék

Hesperocorixa linnaei (Fieber, 1848) – Fehér-szék; Kakasszékhalmi-mocsár; Kis-rét; Kis-sóstó; Ősze-szék; Partos-széki-anyaggödrök

Hydrometra gracilentum Horváth, 1899 – Fehér-szék; Kápolnás-tó; Kardoskúti Fehér-tó; Kelemen-szék; Zab-széki tömpöly

Ilyocoris cimicoides (Linnaeus, 1758) – Fehér-szék; Fehér-tó; Kakasszéki-tó; Kápolnás-tó; Kardoskúti Fehér-szék; Kerek-szik; Kis-rét; Liliomos; Nagy-szik; Partos-széki-anyaggödrök

Limnoporus rufoscutellatus (Latreille, 1807) – Kakasszéki-tó

Mesovelia furcata Mulsant & Rey, 1852 – Fehér-szék; Fehér-szik; Kakasszéki-tó; Kardoskúti Fehér-tó; Kelemen-szék; Kis-rét; Nagy-szik; Nagy-vadas-tó; Zab-széki tömpöly

Micronecta scholtzi (Fieber, 1860) – Kakasszéki-tó

Microvelia reticulata (Burmeister, 1835) – Büdös-szék (Szabadszállás); Fehér-szék; Fehér-szik; Fehér-tó; Kakasszéki-tó; Kápolnás-tó; Kardoskúti Fehér-tó; Kelemen-szék; Kis-rét; Nagy-vadas-tó; Partos-széki-anyaggödrök; Zab-széki tömpöly

Nepa cinerea Linnaeus, 1758 – Fehér-szék; Nagy-szik; Zab-szék

Notonecta glauca Linnaeus, 1758 – Bába-szék; Böddi-szék; Büdös-szék (Pusztaszer); Büdös-szék (Szabadszállás); Fehér-szék; Kápolnás-tó; Kardoskúti Fehér-tó; Kelemen-szék; Kis-rét; Liliomos; Partos-széki-anyaggödrök; Zab-szék

Notonecta viridis Delcourt, 1909 – Bába-szék; Büdös-szék (Szabadszállás); Kápolnás-tó; Partos-széki-anyaggödrök; Zab-szék

Paracorixa concinna (Fieber, 1848) – Bába-szék; Bocskoros-szik; Bogárzó; Böddi-szék; Büdös-szék (Pusztaszer); Büdös-szék (Szabadszállás); Fehér-szék; Fehér-tó; Kardoskúti Fehér-tó; Kelemen-szék; Kis-rét; Nagy-vadas-tó; Sárkány-tó; Zab-szék; Zab-széki tömpöly

Plea minutissima Leach, 1817 – Böddi-szék; Fehér-szék; Fehér-szik; Fehér-tó; Kakasszéki-tó; Kápolnás-tó; Kardoskúti Fehér-tó; Kelemen-szék; Kis-rét; Liliomos; Nagy-szik; Nagy-vadas-tó; Partos-széki-anyaggödrök; Zab-széki tömpöly

Ranatra linearis (Linnaeus, 1758) – Bocskoros-szik; Fehér-szék; Fehér-tó; Kis-rét; Nagy-szik; Partos-széki-anyaggödrök

Sigara falleni (Fieber, 1848) – Bocskoros-szik; Fehér-szék; Kelemen-szék; Kis-rét; Nagy-vadas-tó

Sigara lateralis (Leach, 1817) – Bába-szék; Bocskoros-szik; Bogárzó; Böddi-szék; Büdös-szék (Pusztaszer); Büdös-szék (Szabadszállás); Fehér-szék; Fehér-tó; Fekete-

Table 2: List of water bug species and their occurrences in soda pans and sodic water bodies per sampling years. Identifying of site number is in accordance with Table 1.

Site	1		2	3	4					5		6				7					8	9	10	11		12		13		14			
Species/Sampling year	1999	2001	2001	2001	1998	1999	2000	2005	2010	2000	2001	1998	1999	2000	2010	1998	1999	2000	2001	2010	2001	2004	2001	1999	2001	1999	2001	1997	1999	1997	1999	2005	2008
A. paludum																																	
C. affinis	x	x	x	x	x	x					x	x	x	x		x	x	x	x	x					x	x		x	x	x	x	x	x
C. panzeri																																	
C. punctata	x	x	x	x							x						x	x	x			x		x		x	x		x	x			
C. coleoptrata																															x		
C. rogenhoferi		x	x	x		x	x				x		x	x				x	x	x		x								x			
G. argentatus													x				x	x		x										x			
G. lacustris																														x			x
G. odontogaster												x					x			x				x	x	x	x	x	x	x			x
G. thoracicus					x	x						x	x			x							x	x	x					x			
H. linnaei																		x		x				x									
H. gracilentum																	x											x			x		
I. cimicoides																x	x	x	x	x		x				x	x		x	x	x		
L. rufoscutellatus																										x							
M. furcata																	x	x			x						x			x			
M. scholtzi																											x						
M. reticulata															x		x	x			x	x				x		x		x	x		
N. cinerea																	x																
N. glauca		x				x	x				x		x			x	x	x										x	x	x			
N. viridis		x													x													x					
P. concinna	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x		x	x	x		x								x	x	x	
P. minutissima							x									x	x	x	x		x	x				x	x	x	x	x	x		
R. linearis			x														x	x				x											
S. falleni			x															x		x													
S. lateralis	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x			x	x	x	x	x	x	x
S. striata		x		x	x	x					x	x	x	x		x	x	x		x		x					x						x

Table 2 continued

Site	15							16	17		18		19	20		21		22	23		24	25	26	27	28							29
Species/Sampling year	1998	1999	2000	2001	2005	2007	2010	2004	1998	1999	1999	2001	1997	2001	2008	2001	2005	2005	1999	2001	2004	2001	2001	2000	1998	1999	2000	2001	2005	2007	2010	1999
A. paludum		x																														
C. affinis	x	x	x	x	x		x		x			x							x	x				x	x	x	x	x	x	x	x	
C. panzeri									x																							
C. punctata										x	x			x						x				x								
C. coleoptrata									x																							
C. rogenhoferi		x	x				x		x															x		x	x					x
G. argentatus		x			x		x		x	x						x	x			x						x						x
G. lacustris					x																											
G. odontogaster	x							x	x				x	x		x		x	x										x			x
G. thoracicus	x	x						x																	x	x			x			
H. linnaei									x	x	x							x		x												
H. gracilentum		x																														x
I. cimicoides								x	x	x			x		x					x												
L. rufoscutellatus																																
M. furcata				x					x					x		x																x
M. scholtzi																																
M. reticulata							x		x							x			x	x												x
N. cinerea															x															x		
N. glauca		x							x				x						x	x							x					
N. viridis																				x									x			
P. concinna	x	x	x	x	x	x	x		x								x					x			x	x	x	x	x	x	x	x
P. minutissima		x	x	x					x	x			x	x	x	x	x		x	x												x
R. linearis									x					x					x													
S. falleni				x						x							x															
S. lateralis	x	x	x	x	x	x	x	x	x	x	x	x		x		x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x
S. striata			x	x			x		x	x	x							x		x						x					x	

szik; Kakasszékhalmi-mocsár; Kakasszéki-tó; Kápolnás-tó; Kardoskúti Fehér-tó; Kelemen-szék; Kerek-szik; Kis-rét; Kis-sóstó; Nagy-szik; Nagy-vadas-tó; Partos-széki-anyaggödrök; Peres-szik; Sárkány-tó; Sós-tó; Szappan-szék; Zab-szék; Zab-széki tömpöly

Sigara striata (Linnaeus, 1758) – Bába-szék; Bogárzó; Böddi-szék; Büdös-szék (Pusztaszer); Büdös-szék (Szabadszállás); Fehér-szék; Fehér-tó; Kakasszéki-tó; Kardoskúti Fehér-tó; Kelemen-szék; Kis-rét; Kis-sóstó; Ősze-szék; Partos-széki-anyaggödrök; Zab-szék

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New Tenthredo Linné, 1758 species from China (Hymenoptera, Tenthredinidae)

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HARIS, A.: *New Tenthredo Linné, 1758 species from China (Hymenoptera, Tenthredinidae).*
Abstract: Eleven new species are described from China, namely: *Tenthredo becvari* spec. nov., *Tenthredo ferroyunnanensis* spec. nov., *Tenthredo rubrolineata* spec. nov., *Tenthredo sinorufa* spec. nov., *Tenthredo sinospeciosa* spec. nov., *Tenthredo kucerai* spec. nov., *Tenthredo sinoabrahami* spec. nov., *Tenthredo sinomirabilis* spec. nov., *Tenthredo sinoflava* spec. nov., *Tenthredo sinopotanini* spec. nov. and *Tenthredo rubropedicella* spec. nov."

Keywords: China, Hymenoptera, Tenthredinidae, Tenthredo, new species

Introduction

This is the 11th contribution of the author to study the sawfly fauna of China (HARIS 1996, 2000, 2007, 2008, 2009, 2012, HARIS and ROLLER 1998, 1999 a,b, and 2007a). here we study the *Tenthredo* (Linné, 1758) species of China and provide description of 11 new species. The known *Tenthredo* species from China exceeds the 300 (known number of species in 2006 was 291 (WEI, NIE and TAEGER 2006)).

Material and methods

Most of the studied material was collected by S. Becvar, S. Sazanov, Zd. Jindra, E. Kucera and I. H. Marshal between 1992 and 1998 in different expeditions to Yunnan, Shaanxi and Kansu provinces of China. It amounts approxymately 300 specimens. Only the new species are discussed here. For the identification of the species, we consulted the comprehensive books of MALAISE 1945 and SAINI 2007 completed with numerous papers as follows: HARIS and ROLLER 1998, 2007a,b, HARIS 2009, NIE and WEI 1998, 1999, 2002, NIU and WEI 2008, SHINOHARA 1998, TOGASHI 1980, 1987, WEI 2006, WEI and NIE 1997, 1998a, b, 2002 a,b,c,d, 2006, WEI et al. 1999, 2003, WEI and NIU 2009, YAN et al. 2008 and WEI and ZHONG 2002, ZHAO et al. 2010).

Types are deposited in the collection of Landesmuseum Linz, some paratypes are deposited in the collection of Rippl-Rónai Museum, Kaposvár.

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Results

Tenthredo becvari spec. nov. (Figs. 4 and 7)

Holotype: female, China, Yunnan prov., Heishui 35 km N. of Lijiang, 27,13º N, 100, 19º E, 01-19. 07. 1992, lgt. S. Becvar.

Head ferruginous; white: mandible (except dark brown apex), narrow inner orbit, gena; black: large frontal spot from supraantennal tubercles till hypothetic hind margin of head, not touching eyes. Antenna black, white: apical 4 antennal segment entirely, apex of segment 5 and ventral part of segment 5 and ventroapical strip on segment 4. Thorax ferruginous; black: anterodorsal part of pronotum, enitre mesonotal lobes, metanotum and narrow sutures of meso and metapleuron; white: wide hind margin of pronotum, tegula, mesoscutellum, mesoscutellar appendage and metascutellum. Legs entirely ferruginous only femora with longitudinal black line. Wings yellowish hyaline, venation dark brown, stigma and costa yellow transparent. Abdomen ferruginous, narrow base of propodeum black. Valvula 3 black. Head very densely, moderately deeply punctured on frontal area, vertex and temples matt as well. Narrow inner orbit smooth and shiny. Postocellar carina complete although on vertex weekly visible. OOL : POL : OCL: 21 : 6 : 19. Ratios of antennal segments: 13 : 9 : 36 : 27 : 25 : 17 : 16 : 15 : 18. Antenna about as long as head, thorax and first 2 abdominal segments combined. Gena about 1.1x as wide as diameter of anterior ocellus. Clypeus roundly emarginated and about 0.33x as deep as clypeal median length. Postocellar area wider than long as 12: 21. Head gently dilated than contracted behind eyes. Supraantennal tubercles and frontal crests confluent but week, hardly elevated. Mesonotal lobes very densely granulated, matt. Mesoscutellum, mesoscutellar appendage densely and moderately deeply punctured, moderately shiny. Metascutellum with moderately deep, sporadic punctures, moderately shiny. Mesopleuron moderately densely and moderately sparsely, shallowly punctured with fine wrinkles between punctures, moderately shiny. Mesopleuron strongly elevated, subacute. Mesoscutellum strongly but bluntly elevated. Mesosternum without thorn. Abdominal tergites including propodeum finely microstriated, shiny. Apical tooth of claw longer than subapical. Hind basitarsus shorter than next 2 tarsal segments combined. Length of hind basitarsus : length of inner hind tibial spur: 2.0 : 1.0. Length: 11.7 mm.

Differential diagnosis and related species: check table A at the end of the paper.

Tenthredo ferroyunnanensis spec. nov. (Figs. 5 and 8)

Holotype: female, China, Yunnan, Zhongdian, 3200 m, 03. 07. 1998, leg. S. Sazanov.

Head ferruginous; white: mandible (except dark brown apex), narrow inner upper orbit, gena, lower inner orbit; black: large frontal spot from supraantennal tubercles till hypothetic hind margin of head not touching eyes. Antenna black, antennal segments 6-7(8) entirely, apical part of segment 5 white. Thorax black; white: wide hind margin of pronotum, tegula, mesoscutellum (but not mesoscutellar appendage) and central triangular spot on metascutellum, cenchri and hind linear margin of mesonotum and metanotum; ferruginous: large spot on upper part of mesopleuron, tegula. Legs entirely ferruginous only femora with longitudinal black line. Wings yellowish hyaline, venation dark brown, stigma and costa yellow transparent. Abdomen ferruginous, 1st tergite (pro-

podeum) and most of 2nd tergite (except ferruginous wide hind margin) black. Margin of valvula 3 black. Head very densely, moderately deeply punctured on frontal area, vertex and temples as well, gently shiny. Narrow inner orbit smooth and shiny. Postocellar carina complete although on vertex weekly visible. OOL : POL : OCL: 21 : 8 : 17. Ratios of antennal segments: 19 : 13 : 40 : 33 : 29 : 20 : 18 : 17 : 18. Antenna about as long as head, thorax (including half length of propodeum) combined. Gena about 1.8x as wide as diameter of anterior ocellus. Clypeus roundly emarginated and about 0.34x as deep as clypeal median length. Postocellar area wider than long as 17: 22. Postocellar furrows hardly visible. Head gently dilated than contracted behind eyes. Supraantennal tubercles and frontal crests confluent. Mesonotal lobes, mesoscutellum and mesoscutellar appendage very densely granulated, matt. Metascutellum with moderately deep, moderately dense punctures, moderately shiny. Mesopleuron densely and moderately roughly, moderately deeply punctured matt. Mesopleuron strongly elevated, subacute. Mesoscutellum gently and bluntly elevated. Mesosternum without thorn. Abdominal tergites including propodeum finely microstriated, shiny. Apical tooth of claw longer than subapical. Hind basitarsus shorter than next 2 tarsal segments combined. Length of hind basitarsus : length of inner hind tibial spur: 24 : 15. Length: 14.5 mm.

Differential diagnosis and related species: check table A at the end of the paper.

Tenthredo rubrolineata spec. nov. (Fig. 9)

Holotype: female, China, Yunnan, Heishui, 35 km N. of Lijiang, 27,13º N 100,19º E, 01-19- 07- 1992, lgt. S. Becvár. Paratype: female, topotypic.

Head dark reddish brown; black: large frontal spot from antennae till hind margin of head not reaching eyes but covering vertex and temples. Clypeus brown, labrum black. White: mandibles (expet brown-black apex). Scape reddish brown, antennal joints 2-5 and 9 black, ventral part of antennal segment 5 and segments 6-8 white. Thorax black; yellowish white: wide hind margin of pronotum and cenchri; reddish brown: tegula and mesoscutellum (mesoscutellar appendage black). Legs entirely reddish brown only femora with longitudinal black line. Wings with slight yellowish brown infuscation, stigma, costa, apical third of subcosta yellow, veins black; brownish red: central hind margins of tergite 2-6 (wider in tergites 3-6), apex of abdomen from tergite 7 brownish black. Tergite 1 and 2 with lateral reddish yellow spot (only on tergite 1 on paratype). OOL : POL : OCL: 11: 2: 8. Postocellar area little wider than long as 9: 11. Ratios of antennal segments: 15 : 15 : 45 : 35 : 32 : 25 : 20 : 21 : 20. Antenna about as long as head and thorax combined including propodeum. Head including vertex, most of temples and frontal area and around densely granulated with moderately large granules, matt. Narrow inner orbits smooth and shiny. Frontal crest and supraantennal tubercles confluent. Occipital carina complete. Gena about 1.2x as wide as diameter of front ocellus. Head dilated than contracted behind eyes. Clypeus roundly emarginated, clypeal emargination about 0.3x as deep as clypeal median length. Mesonotal lobes densely and finely granulated, matt, granules even more smaller and finer than those on head. Mesoscutellum densely punctured with moderately deep punctures, moderately shiny. Mesoscutellar appendage and metascutellum densely punctured with moderately large and deep punctures hardly shiny. Mesopleuron with dense, moderately large and moderately deep and rough pounctures and also wrinkled, hardly shiny. Mesoscutellum flat. Mesosternum gently and bluntly elevated. All abdominal tergites, including propodeum,

with fine microstriation, gently shiny. Length of hind basitarsus : length of inner hind tibial spur: 55 : 33. Hind basitarsus longer than next 2 but shorter than next 3 tarsal segments. Apical tooth of claw longer than subapical. Length: 13.6 mm.

Colour variations: abdominal sternites black in holotype but brownish yelow in paratype. Last abdominal tergites brownish black in holotype, but they are reddish brown in paratype. Mesoscutellum black in paratype.

Differential diagnosis and related species: check table A at the end of the paper.

Tenthredo ferruginea Schrank, 1776, local color variation (Figs. 6 and 10)

Female, China, Shaanxi prov., Qing Ling Shan mts., road Baoji-Taibai will., 21-23. 06. 1998, pass 40 km S of Baoji, Zd. Jindra legt.

Head black; white: narrow inner margin oy eyes, mandibles (except apex), palpi, 2 blurred spot on base of labrum, short horisontal line on temple; reddish brown: hind orbit, labrum, clypeus and supraclypeal area. Antenna black, scape reddish brown, apex of segment 5 and segments 6-8 white. Thorax black; white: wide hind pronotal margin, margin of tegula, narrow linear hind margin of mesonotum and narrow linear hind margin of metanotum. Wings subhyaline, costa, apex of subcosta and stigma yellow transparent, base of stigma with infuscated spot. Veins black. Coxae, trochanters and femora black, apical 2/3 of anterior and apical 1/3 of middle femora reddish brown. Tibiae and tarsi white. Abdomen black; white: narrow linear hind margin of propodeum; red: abdominal tergites and sternites 3-5 and spot on valvula 3. Frontal area and around, vertex and temples very densely, deeply punctured with moderately small punctures, nearly granulated, gently shiny. Inner narrow orbits smooth and shiny. Supraantennal tubercles confluent with antennal crests. OOL : POL : OCL: 26 : 9 : 19. Postocellar area wider than long as 23: 19. Ratios of antennal segments: 20 : 13 : 46 : 39 : 38 : 29 : 26 : 22 : 22. Antenna about as long as head and thorax combined including propodeum. Mesonotum finely granulated, matt. Mesoscutellum and mesoscutellar appendage densely and deeply punctured with small punctures, moderately shiny. Anterior part of metascutellum smooth and shiny, posterior part densely punctured with small and deep punctures. Mesopleuron densely, roughly punctured with moderately small and moderately deep punctures, hardly shiny. Mesoscutellum flat. Mesopleuron gently and bluntly elevated. Mesosternum without thorn. Abdominal tergites with microstriation, moderately shiny. Length of hind basitarsus : length of inner hind tibial spur: 15 : 6. Hind basitarsus longer than next 2 tarsal segments combined but shorter than next 3. Apical tooth of claw longer than subapical. Length: 14.2 mm.

Differential diagnosis and related species: check table A at the end of the paper.

Tenthredo sinorufa spec. nov. (Fig. 11)

Holotype: female, China, Yunnan prov., Heishui, 35 km N. of Lijiang, 27,13º N, 100,19º E, 1-19. 07. 1992, lgt. S. Becvar.

Head, antenna and thorax black; white: antennal segments 6-9, ventral strip on segment 5, narrow lover quarter of inner orbit, mandible (except brown apex), 2 lateral-anterior spots on clypeus, palpi, cenchri and linear hind margin of metanotum; brown:

margin of labrum. Coxae, trochanters and femora black. Tibiae and tarsi brown. Wings subhyaline, gently brown infumate, costa yellow, stigma brown with yellow upper margin, veins black. Abdominal segments 1 and 2 black with confluent white lateral spots. Other segments red with 2 latero-ventral black band. Ovipositor black. Head including temples and vertex and inner orbit, moderately deeply and very densely punctured with moderately small punctures, matt. OOL : POL : OCL: 21 : 7 : 16. Postocellar area wider than long as 21 : 16. Postoccipital carina complete. Ratios of antennal segments: 17 : 13 : 42 : 31 : 28 : 22 : 16 : 15 : 17. Antenna as long as head and thorax combined including propodeum. Frontal crests not visible. Supraantennal tubercles present. Clypeus roundly emarginated, clypeal emargination about 0.28x as deep as median clypeal length. Gena about 1.8x as wide as diameter of anterior ocellus. Mesonotum densely granulated matt. Mesoscutellum and mesoscutellar appendage densely granulated matt, although granules are deeper. Metascutellum smooth and shiny with few large punctures. Mesopleuron roughly, very densely and moderately deeply punctured with moderately large punctures, without shiny interspaces. Hardly shiny. Mesoscutellum nearly flat, mesopleuron gently and bluntly elevated, mesosternum without thorn. Abdominal tergites, including propodeum, with microstriation, gently shiny. Length of hind basitarsus : length of inner hind tibial spur: 63 : 22. Basitarsus hardly longer than next 3 tarsal segments combined. Apical tooth of claws much longer than subapical. Length: 13.0 mm.

Differential diagnosis and related species: check table A at the end of the paper.

Tenthredo sinospeciosa spec. nov. (Figs. 1 and 12)

Holotype: female, China, Shaanxi prov., Qing Ling Shan mts., road Baoji and Taobai will., pass 40 km S. Baoji, 21-23. 06. 1998, lgt. Zd. Jindra.

Head black; white: temples and narrow inner margins of eyes connected to each other, 2 minute spot on vertex, manddibles, 2 small spots on basal margin of labrum and palpi. Middle of clypeus with subtriangular, whitish brown spot. Antenna black, white: apex of fifth, 6-7th entirely, 8th segment partly. Thorax black; white: wide hind margin of pronotum, tegula, mesoscutellum, metascutellum, narrow line behind metascutellum and cenchri. All coxae, trochanters and femora black. All tibiae and tarsi white. Wings hyaline, stigma, venation black, costa dark brown. Abdomen black; white: lateral spots on tergites 1-5 forming confluent line, narrow, linear hind margin of propodeum. Apical 2/3 of tergite 3 and 4 yellowish white. Frontal area and around, vertex densely, minutely and moderately deeply punctured, shiny. Inner margins of eyes smooth and shiny. Temples with moderately sparse, minute punctures, shiny. Ratios of antennal segments: 20 : 15 : 54 : 44 : 41 : 31 : 29 : 25: 25. Antenna as long as head and thorax combined (including propdeum). OOL : POL : OCL: 13 : 4 : 10. Postocellar area slightly wider than long as 6 : 5. Postoccipital carina reaching up to postocellar furrows. Head dilated than contracted behind eyes. Supraantennal tubercles moderately developed confluent with supraantennal crests. Gena about as wide as diameter of anterior ocellus. Clypeus trapesodially emarginated, clypeal emargination about 0.25x as deep as median clypeal length. Mesonotal lobes densely, uniformly granulated, matt. Mesoscutellum and mesoscutellar appendage densely, moderately deeply punctured, hardly shiny. Metascutellum moderately densely, deeply punctured with deep punctures, moderately shiny. Mesopleuron very finely and very densely wrinkled and punctured, hardly shiny. Mesopleuron strongly but bluntly elevated. Mesoscutellum flat. Mesosternum without thorn. Abdominal tergites shiny. Hind basitarsus longer than next 2 but shorter than next

3 tarsal segments combined. Length of hind basitarsus : length of inner hind tibial spur: 64 : 31. Apical and subapical tooth of claws subequal. Length: 14.7 mm.

Differential diagnosis and related species: check table B at the end of the paper.

Tenthredo kucerai spec. nov. (Figs. 2 and 13)

Holotype: female, China, Yunnan prov., Dequen, 3900 m/m, 10-19. 07. 1996, E. Kucera leg.

Head pale ferruginous; black: large frontal spot from supraantennal tubercles till hypothetic hind margin of head including vertex and temples not reaching eyes. Basal 3 segments of antenna ferruginous, white from segment 4 with dorsal longitudinal black line on its total length. Thorax pale ferruginous with one-one wide black band on mesonotum covering lateral third of middle and lateral half of lateral lobes and sunken area of metanotum between mesoscutellar appendage and metascutellum. Legs pale ferruginous, femora and four anterior tibiae with black longitudinal line. Costa yellow except black apical fifth, subcosta, stigma and veins black. Wings subhyaline. Abdomen including ovipositor black, propodeum with wide anterior and hind yellow margins. Base of ovipositor with small yellow spot. Head very densely punctured with small, moderately deep punctures without interspaces, hardly shiny. OOL : POL : OCL: 21 : 6 : 12. Postocellar area wider than long as 21 :12. Postoccipital carina complete. Postocellar furrows hardly visible. Ratios of antennal segments: 15 : 10 : 38 : 25 : 22 : 19 : 17 : 15 : 16. Antenna about as long as head and thorax combined without propodeum. Supraantennal tubercles confluent with frontal crests. Gena about 0.8x as wide as diameter of anterior ocellus. Clypeus roundly emarginated, clypeal emargination about 0.4x as deep as clypeal median length. Mesonotum densely granulated, matt. Mesoscutellum and mesoscutellar appendage with dense, moderately deep and small punctures, interspaces with fine wrinkles. Metascutellum with sporadic larger and moderately deep punctures, finely wrinkled, bluntly shiny. Mesopleuron very densely, moderately roughly and moderately deeply punctured, bluntly shiny. Mesoscutellum gently, slightly elevated with blunt horizontal carina, mesopleuron slightly and bluntly elevated, mesosternum without thorn. Length of hind basitarsus : length of inner hind tibial spur: 51 : 23. Hind basitarsus as long as next 3 tarsal segments combined. Subapical tooth of claw shorter than apical. Length: 12.1 mm.

Differential diagnosis and related species: check table B at the end of the paper.

Tenthredo sinoabrahami spec. nov. (Fig. 14)

Holotype: female: China, Yunnan, 25 km E. Zhongdian, 3500 m, 22. 06. 1998, leg. S. Murzin.

Head pale yellow (including mouthparts) black only a large frontal spot covering temples, vertex, frontal area reaching upper inner half margin of eyes leaving only 1-1 minute drop-shaped yellow spots on upper corner of eyes. Antenna black, scape and pedicell pale yellow. Thorax pale yellow; black: mesonotal lobes entirely (except narrow hind margin of hind, posterior lobes), and metanotum (leaving pale yellow of all scutelli). Abdominal tergites from tergite 3 ferruginous. Propodeum and 2nd tergite black, propodeum with wide yellow basal and apical margine. Abdominal sternites yellow.

Legs entirely yellow. Wings hyaline, costa and stigma pale yellow, venation brown. Head, including temple and vertex deeply and roughly punctured, shiny, around frontal area densely wrinkled. Postoccipital carina complete and well developed. Ratios of antennal segments: 10 : 5 : 22 : 15 : 15 : 13 : 10 : 10 : 10. Antenna short and relatively thick, as long as head head and thorax without propodeum combined. OOL : POL : OCL: 14 : 5 : 10. Postocellar area wider than long as 1 : 1.6. Clypeus roundly emarginated. Clypeal emargination about 0.33x as deep as clypeal median length. Gena 1.2x as wide as diameter of anterior ocellus. Supraantennal tubercles confluent with antennal crest, normally, not strongly, developed. Mesonotal libes with minute, moderately deep and very dense punctures, moderately shiny. Mesoscutellum with moderately large, deep, dense punctures, moderately shiny. Mesoscutellar appendage with large, deep and dense punctures, modertely shiny. Metascutellum nearly smooth and shiny with few deep punctures. Mesopleuron densely punctured with moderately deep, moderately small punctures, also wrinkled, herdly shiny. Mesopleuron strongly elevated. Mesoscutellum bluntly, subpiremidally elevated with blunt horisontal carinas. Head and abdomen with moderately dense, short, white pubescence. Propodeum shiny with very fine sutface sculpture. Other tergites hardly shiny with microstriation. Length of inner hind tibial spur : length of hind basitarsus: 17 : 41. Hind basitarsus hardly shorter than next 3 segments combined as 41 : 45. SUbapical tooth of claws hardly shorter than apical. Length: 8.7 mm.

The new species is dedicated to Dr. Levente Ábrahám.

The very closest relative of the new species is *Tenthredo grombczewskii* (Jakowlew, 1891). The differences: scapus and pedicell are entirely yellow in the new species (they are black in *T. grombczewskii*), the new species much smaller (8.7 mm versus 13-14 mm) and legs completely yellow (dorsal side of all femora and line of anterior tibia black in *T. grombczewskii*). Gena of *Tenthredo grombczewskii* very elongated, 2.5x as long as diameter of anterior ocellus, in the new species gena subequal with the diameter of anterior ocellus (see the description above).

Other related species:

Tenthredo brevipilosila Wei, 2002, large, 15 mm species (the new species is only 8.7 mm), antenna long (short in the new species) and legs richly decorated with balck (entirely yellow in the new species). *Tenthredo brevipilosila* Wei, 2002 is closely related to *T. shenisensis. Tenthredo nigrobasalis* Malaise, 1945 has tergite 1 and 2 black, other tergites red, otherwise completely different from the new species having legs are richly coloured with black, and head and thorax black.

Tenthredo sinomirabilis spec. nov. (Fig. 15)

Holotype: female, China, Shaanxi, Qinling mts. Xunyangba (6 km E), 1000-1300 m., 23. 05.- 13. 06. 1998, leg. I. H. Marshal

Head and antenna black; white: mandible (except apex), labrum, clypeus, palpi and blurred spot on lower third of outer orbit. Thorax black; white: wide hind margin of pronotum, tegula, large elongate spot on mesopluron, vertical broad band on katepimeron, most of metepisternum. Legs white; black: hind femur, dorsal side of middle femur, dorsal line of anterior femur, small apical spot of anterior and middle tibiae, apex and dorsal line on hind tibia. Wings subhyaline, apical third gently brown infuscate. Stigma black with wide lower yellow transparent margin, costa, subcosta and veins black.

Abdomen black; yellow: wide margin of propodeum, wide, central hind margins of tergites 3-9: tergite 8 dominantly yellow, hind yellow bands on tergites 5-6 spot-like, short. Sternites dominantly yellow with wide basal black margins. Base of ovipositor white, otherwise black. Head shiny with sporadic large and deep punctures. Postoccipital carina complete. OOL : POL : OCL: 25 : 7 : 15. Postocellar area wider than long as 5: 3. Ratio of antennal segments: 22 : 14 : 53 : 39 : 35 : 25 : 22 : 19 : 19. Antenna about as long as head and thorax combined including half of propodeum. Supraantennal tubercles confluent with frontal crests. Gena about 0.8x as wide as diameter of anterior ocellus. Clypeal emargination about 0.2x as deep as clypeal median length. Mesonotum and mesoscutellum with very dense, small and deep punctures, nearly granulated, moderately shiny. Mesoscutellar appendage with fine coriaceous surface sculpture with few large and deep punctures, slightly shiny. Metascutellum roughly, horizontally wrinkled, hardly shiny. Mesopleuron very densely, minutely, shallowly punctured, moderately shiny. Mesoscutellum flat. Mesopleuron gently and bluntly elevated. Mesosternum without thorn. First tergite (propodeum) with minute coriaceous surface sculpture, other tergites with fine microstriation, moderately shiny. Length of hind basitarsus : length of inner hind tibial spur: 15 : 7. Hind basitarsus longer than next 2 tarsal segments combined but shorter than next 3. Length: 15.0 mm.

In the key of MALAISE (1945), and SAINI (2007), the new species runs to *Tenthredo kumaonensis* (Rohwer, 1921), valid name is *Tenthredo dorsivittata* (Cameron, 1902). *Tenthredo dorsivittata* Cameron has mesonotum polished with small separate punctures, mesopleuron shiny with sparse punctures, a band below antennae is white, hind femur partly, mesosternum white, clypeus moderately deeply emarginated (0.25x), propodeum in dorsal view is black, lower hind orbit white. The new species has mesonotum hardly shiny with dense punctures, mesopleuron densely, minutely punctured, hardly shiny, area below antenna is completely black, hind femur entirely black, hind tibia with longitudinal black line, tergites 3 and 4 without large triangular spot, mesosternum is black, clypeus hardly emarginated (0.17x), half of propodeum in dorsal view is yellowish white, lower hind orbit is black.

Other closely related species is *Tenthredo melanosternum* M.S. Saini & Vasu, 1999. The abdominal pattern of *Tenthredo melanosternum* Saini and Vasu is completely different from the new species (see Fig. 346 in SAINI 2007), anterior lobe of mesonotum with pale apex (entirely black in the new species) and clypeus is moderately deeply emarginated (0.25x) but subtruncate in the new species (0.17x).

In *Tenthredo shii* Wei, 1998, clypeus even more deeply emarginated (0.33x as deep as clypeal median length) and all scutelli are pale, mesonotum is indistinctly punctured and shiny (subtruncate in the new species and scutelly are black, mesonotum is distinctly punctured, hardly shiny).

Finally, the new species differs from *Tenthredo malimilova* Wei, 2005, that *T. malmilova* has all scutelly and scape pale, 1st and 2nd tergites smooth and shiny and clypeus roundly emarginated. These are black in the new species, all tergites with fine microstriation and never smooth and shiny and clypeus is subtruncate.

Tenthredo sinoflava spec. nov. (Figs. 3 and 16)

Holotype: female, China, Shaanxi, Qinling mts., Xunyangbam (6 km E) 1000-1300 m., 05. 23.- 13. 06. 1998, I. H. Marshal leg.

Body pale straw (green in living); black: antenna entirely, frontal spot anteirorly straight cut before anterior ocellus, reaching inner margin of eyes, partly covering vertex and temples, mesonotum (except V-shaped pale hind margin of anterior lobe), sunken area between mesoscutellum and metascutellum, abdominal tergites (wide anterior margin and triangular posterior margin of propodeum, hind margines of tergites 2-3 and trinagular hind margin of tergite 4 remaining pale), longitudinal broken band on mesopleuron, dorsal longitudinal line of all femora, apex of middle and hind tibiae, longitudinal line of hind tibia, hind margin of ovipositor and hind tarsus. Wings hyaline, stigma, costa and subcosta after broken part yellow, veins black. Head smooth and shiny. Postoccipital carina complete. OOL : POL : OCL: 22 : 5 : 16. Postocellar area wider than long as 23 : 16. Ratio of antennal joints: 18 : 14 : 47 : 35 : 30 : 25 : 20 : 19 : 19. Antenna as long as head and thorax combined including propodeum. gena about 0.6x as wide as diameter of anterior ocellus. Clypeus widely emarginated, clypeal emargination about 0.16x as deep as clypeal median length. Supraantennal tubercles confluent with frontal crests. Mesonotum densely, minutely and moderately punctured, shiny. Mesoscutellum and mesoscutellar appendage smooth and shiny. Metascutellum shiny with sporadic, moderately large, deep punctures. Mesopleuron very densely and minutely punctured, hardly shiny. Mesoscutellum strongly but not acutely elevated. mesopleuron strongly subacutely elevated. Mesosternum without thorn. Abdominal tergites shiny with fine microstriation (including propodeum). Length of inner hind tibial spur: length of hind basitarsus: 16 : 29. Hind basitarsus subequal with next three tarsal segments combined as 58 : 60. Apical tooth of claw subequal or slightly longer than subapical. Length: 12.3 mm.

The species belongs to *Tenthredo subflava* group which has 10 members, namely *Tenthredo casta* Konow, 1908; *T. bilineacornis* Wei, 1998; *T. nigroscalaris* Malaise, 1945; *T. flatoscuteuania* Wei et Niu, 2010; *T. latidentella* Wei et Zhao, 2010 ; *T. longitudicarina* Wei, 2006; *T. tenuisomania* Wei, 1998; *T. subflava* Malaise, 1945; *T. mossafila* Wei, 2002 and *T. laoviridis* Haris, 2013. It would run to *T. subflava* Malaise, 1945 in the key of ZHAO et al. (2010) having very strongly elevated (although definitely not acute mesoscutellum) and very strongly elevated (although not acute) mesepisternum-mesopleuron and clearly developed but definitely low, not elevated supraantennal tubercles.

The frontal spot of *T. nigroscalaris* Malaise, 1945 is very small comparing the one of the new species (see the photo of holotype of *T. nigroscalaris* Malaise in HARIS 2013).

Tenthredo sinopotanini spec. nov. (Fig. 17)

Holotype: female, China, Shaanxi prov. Qing Ling Shan mts., road Baoji-Taibai, pass 40 km S. Baoji, 21-23. 06. 1998., Zd. Jindra lgt.

Body pale straw (green in life); black: antenna entriely, total dorsal side of head starting from supraclypeal area including inner orbits, temples and vertex, mesonotum, metanotum, hind wide margin of mesoscutellum, metascutellum (except pale spot in middle), vertical band on mesopleuron, hind margin of mesopleuron, longidudinal line on all femora and on four anterior tibiae, hind tibia entirely, all tarsus. Abdominal tergites black; pale: wide anterior and posterior margines of propodeum, apical half of tergite 3, narrow central margin of tegite 4, narrow hind margine of tergite 8, tergite 9 entirely. Abdominal sternites and ovipositor pale, valvula 3 with black margine around. Wings slightly infuscate, veins, costa, subcosta and stigma black. Head densely, moder-

ately deeply and not uniformly punctured with small punctures, shiny, interspaces about 0.2-0.8x as large as a puncture. Postoccipital carina complete. OOL : POL : OCL: 6 : 2 : 5. Postocellar area wider than long as 5 : 9. Ratios of antennal segments: 12 : 7 : 29 : 21 : 19 : 13 : 13 : 12 : 12. Supraantennal tubercles and antennal crests confluent, supraantennal tubercles slightly developed. Antenna about as long as head and half of thorax (till mesoscutellum) combined. Gena about 0.7x as wide as diameter of anterior ocellus. Clypeal emargination about 0.33x as deep as clypeal median length. Mesonotum very densely, minutely, uniformly and moderately deeply punctured, moderately shiny. Mesoscutellum densely and moderately deeply punctured with minute punctures, shiny. Mesoscutellar appendage with sporadic, moderately small, deep punctures, shiny. Metascutellum with moderately large, shallow punctures, shiny. Mesopleuron densely punctured with minute, moderately deep punctures, moderately shiny. Mesoscutellum bluntly elevated, mesopleuron strongly, subpiramidally elevated. Mesosternum without thorn. Abdomen from tergite 2 with fine microstriation, shiny. Length of hind basitarsus : length of inner hind tibial spur: 45 : 21. Hind basitarsus as long as next 3 tarsal segments combined. Length: 9.7 mm.

The new species is related to *Tenthredo danbanica* Wei & Niu, 2009, however, *T. danbanica* has only a frontal spot, scape and pedicell are yellow, third tergite is dominantly black. In the new species, head, except hind orbit, is black and also scape and pedicell are black, third tergite with wide yellow band.

The other relative is *Tenthredo brachycera* (Mocsáry, 1909), however, in *T. brachycera* (and its relatives) the 4th tergite is yellow, not the 3rd as in the new species. Furthermore, in *T. brachycera*, the mesosternum black but entirely pale in the new species.

Tenthredo rubropedicella spec. nov. (Fig. 18)

Holotype: female, China, Kansu mer., Xiahe (Labrang), 3300-3700 m., 01-15. 06. 1998, V. Major leg. Paratype: topotypic.

Antenna black, only pedicell (2nd segment) ferruginous (scape and antennal flagellum entirely black). Head black; yellow: clypeus, labrum, mandibles (except brown apex) and palpi yellowish white. Thorax entirely black (only cenchri pale). All coxae, trochanters and femora black. Tibiae reddish yellow, anterior 4 tibiae with apical small black spot, hind tibiae with wider black apical ring. Tarsi reddish yellow. Wings hyaline; stigma, apical third of costa, subcosta and veins black. Basal 2/3 of costa yellow. Abdomen black, 3rd tergite yellow with large anterior semicircular black area. Tergite 4 with 2 yellow lateral spots. Tergite and sternite 7 yellow with black anterior margine. Tergite 10 yellow. Sternites 3 and 4 with large central yellow spot on hind margin. Ovipositor black. OOL : POL : OCL: 22 : 5 : 10. Postocellar area wider than long as 2 : 1. Ratios of antennal segments:14 : 8 : 30 : 17 : 16 : 13 : 12 : 11 : 11. Antenna about as long as head and half of thorax combined. Total area of head very densely punctured with small but rough, moderately deep punctures, matt. Supraantennal tubercles slightly developed and confluent with frontal crest. Postoccipital carina complete. Gena about 0.9x as wide as diameter of anterior ocellus. Clypeal emargination about 0.25x as deep as clypeal median length. Mesonotal lobes and mesoscutellum densely granulated, matt. Mesoscutellar appendage, densely, roughly punctured with moderately deep and moderately large punctures, moderately shiny. Metascutellum, densely, moderately deeply

punctured with small punctures, hind margin smooth and shiny. Mesoscutellum gently and bluntly elevated. Mesopleuron strongly, subacutely elevated. Mesosternum without thorn. All abdominal tergites with fine microstriation, gently shiny. Length of hind basitarsus : length of inner hind tibial spur: 22 : 10. Hind basitarsus longer than next 2 but shorter than next 3 tarsal segments combined. Subapical tooth of claw shorter than apical. Length: 11.1 mm.

Differences

1 (2) Thorax is entirely black, scape is ferruginuous
.....*Tenthredo rubropedicella* spec. nov.
2 (1) Scutelly are yellow, whole antenna is black.
3 (4) Apical third of anterior wing is dark infuscate. Stigma is pale brown. Sternites are dominantly black (except sternites 3-4 and posterior margines of sternites 5-7). Hind femur is pale with dorsal black strip. (YAN et al. 2008)
.....*Tenthredo hengshana* Wei & Yan, 2008
4 (3) Wing is hyaline. Stigma is blackish brown. All sternites are whitish yellow. Hind femur is black..... *Tenthredo sinotemula* Haris, 2009

The new species is also similar to the Palaearctic *Tenthredo temula* Scopoli, 1763 (and related species). In these species, tergite 7 always black (yellow in the new species) and pedicell is black, tibiae are yellow with black apex (in the new species both are red).

Table A

Antenna is black with white apex (last apical 2 segments may be black), in several species the apical white segments with longitudinal black line. Body is black or rusty brownish red. Abdomen is red or red with basal tergites or black with middle red band. Mesonotum is densely punctured matt. First tergite(s) frequently with white lateral spots. Wings hyaline.

1 (2) Base colour of abdomen is black with bluish or violet lustre (*Tenthredo variicolor* group). 4 species not discussed here: *Tenthredo variicolor* Malaise, 1945; *Tenthredo seriemaculata* Malaise, 1945; *Tenthredo breviserrata* Wei, 1998 and *Tenthredo multimaculata* Wei, 2002

2 (3) Base colour is different, (only 1 species is with metallic lustre but it is restricted to last 4 apical tergites).
3 (2) Abdomen is red and black or dominantly red.
4 (15) Mesoscutellum is not black, mostly pale: white or yellowish white or black with large central white spot (in 1-1 species it is red or brownish yellow).
5 (6) Mesoscutellum and clypeus is red-fulvous. Apical abdominal segments are black with faint purplish tinge. Otherwise abdomen is fulvous. Apical third of hind femur black .....*Tenthredo hingstoni* Malaise, 1945
6 (5) Mesoscutellum is not red. Pale, mostly white (in one species brownish yellow).
5(6) Pale apical part of antenna with longitudinal black line. (All femora are ferruginous frequently stripped with black. Head is pale with large ocellar spot leaving wide pale inner orbit which is confluent with pale temples. Abdomen is ferruginous except blackish anterior 2/3 of propodeum and medial spot on tergite 2.)
.....*Tenthredo waltoni* Malaise, 1945
6 (5) Pale apical part of antenna without longitudinal black line.
7 (10) Propodeum (tergite 1) and tergite 2 like total abdomen red.
8 (9) Head is ferruginous without any black frontal spot. Tergites 3-7 with pair of

obscure black spots. Femora without black band. Dominantly dark reddish brown only with few white and black spots.
.....*Tenthredo rufoglabrata* Wei, 1998
9 (8) Head is ferruginous with large black frontal spot. Tergites without any pair of black spots. Hind femur with longitudinal black line. White: mandible, narrow inner orbit, gena; black: large frontal spot from supraantennal tubercles till hypotethic hind margin of head not touching eyes.....*Tenthredo becvari* sp. n.
10 (7) At least propodeum (tergite1) is black, mostly tergite 2 is also black or dominantly black.
11 (12) Mesonotum and also abdomen are dominantly brownish yellow, abdominal apex is black. Head is with black frontal spot which is far from eyes, hardly covering the temples but covering the vertex.....*Tenthredo clavata* Saini, 2007
12 (11) Mesonotum is dominantly black, abdomen is red or red and black.
13 (14) Upper 2/3 of mesopleuron is white, mesosternum is black. Legs are brownish white with black longitudinal line. First abdominal tergite is black, abdomen till 5th tergite is gradually turning from black to reddish brown.

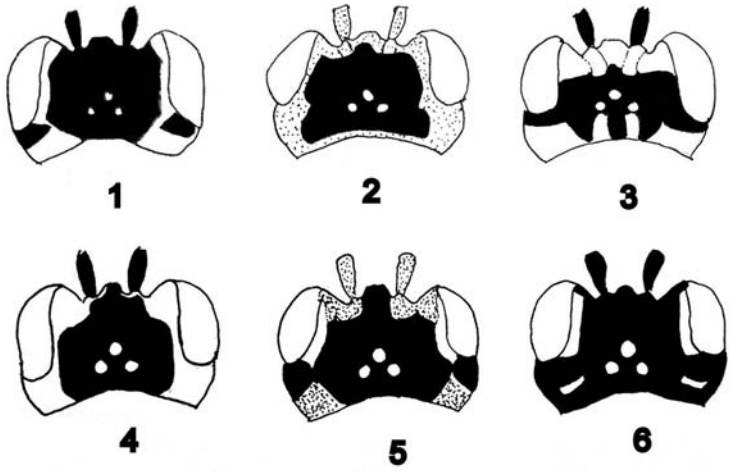

Fig. 1: Head of *Tenthredo sinospeciosa* spec. nov.; Fig. 2: Head of *Tenthredo kucerai* spec. nov.; Fig. 3: Head of *Tenthredo sinoflava* spec. nov.; Fig. 4: Head of *Tenthredo becvari* spec. nov.; Fig. 5: Head of *Tenthredo ferroyunnanensis* spec. nov.; Fig. 6: Head of *Tenthredo ferruginea* Schrank colour var.

.....*Tenthredo yunanensis* Haris and Roller, 1998
14 (13) Mesopleuron and mesosternum are black upper part of mesopleuron with reddish brown spot. (otherwisee it is close to *T. waltoni* Malaise, but *T. ferroyunnanensis* has base colour of head dark ferruginous not white and frontal spot is much wider and different in shape). Thorax black; white: wide hind margin of pronotum, tegula, mesoscutellum (but not mesoscutellar appendage) and central triangular spot on metascutellum. Ferruginous: large spot on upper part of mesopleuron, tegula. Legs entirely ferruginous only femora with longitudinal black line. Abdomen ferruginous, 1st tergite (propodeum) and most of 2nd tergite (except ferruginous wide hind margin) black.
.....*Tenthredo ferroyunnanensis* sp. n.
15 (4) Mesoscutellum is black.
16 (31) Hind margin of pronotum and frequently tegula are pale, mostly white.
17 (26) Base colour of abdomen is red. Abdomen is never black-red-black with red middle segments. Propodeum is always black, other tergites are more or less covered with

black, sometimes only apical half of abdominal tergites remain red or brownish red.
18 (19) Abdominal tergites 1-6 are black with central red margins on tergites 3-6, apex of abdomen is reddish brown. Head is dark reddish brown; black: large frontal spot from antennae till hind margin of head not reaching eyes but covering vertex and temples. Clypeus brown, labrum black. Scape also reddish brown.
.....*Tenthredo rubrolineata* sp. n.
19 (18) Abdominal tergites are differently coloured.
20 (21) 1st and 2nd tergites are black the others are coloured with suffused blackish shade more or less covering the brown ground-colour, apical tergites brown. Abdominal sternites and ovipositor are brownish white. Head brown with large black dorsal spot. Mesonotum and all scutelli black.....*Tenthredo minutosimplicis* Haris, 2004
21 (20) Differently coloured. Propodeum (sometimes tergite2) is black but other tergites are entirely or dominantly red.
22 (23) Propodeum and tergite 2 are black. Other parts of abdomen is red. Head below antennal sockets, narrow inner orbits and occipital carina are yellowish white. Femora and tibiae are red, femora with longitudinal black line.....*Tenthredo qinlingia* Wei, 1998
23 (22) Tergite 2 is always red.
24 (25) Abdomen is brownish red. Propodeum is black, further black are: large reverse subtriangular spot on tergite 2, apical half of tergite 7, tergites 8 and 9 entirely. Mesopleuron is brownish red with dorso-ventral black line. (Flagellar segments of antenna are black above and white below).....*Tenthredo yunningsiensis* Haris, 2009
25 (24) Abdomen is brownish red, propodeum black, other tergites each with a diminishing paired black spots forming a diminishing black band between the red middle part and lateral white bands. Mesopleuron is with an anterior pale spot. (Only apical white antennal segments may stripped with black.).....*Tenthredo pseudoferruginea* Malaise, 1945
26 (17) Basal abdominal tergites are black, or dominantly black, middle tergites (3-5) are entrirely red and apical tergites are dominantly black, abdomen with middle red band.
27 (30) Tibiae are white.
28 (29) Clypeus and labrum are black. Lateral sides of tergite1 and 2 with white spots. Apical tergites are entirely black
.....*Tenthredo ferruginea* Schrank, 1776 (local colour form)
29 (28) Clypeus is white with narrow black basal margin and with 2 small black spots. Labrum is white. Lateral sides of tegite 2 is red, other tergites are black, 8th and 9th tergites each with 2 whitish brown spots.....*Tenthredo sinosimplex* Haris, 2009
30 (27) Tibiae are black. Clypeus and labrum are dark brown. Deflexed sides of tergite 6 are reddish brown.....*Tenthredo hajeki* Haris & Roller, 2007
31 (16) Pronotum and tegula are black. (Entire thorax incl. pronotum and tegula are black, abdomen from segment 3 is red.
31 (32) Tergite 1 and 2 without lateral white spots. Clypeus more or less white or brown but without white spots: *Tenthredo rubiobitava* Wei, 2002 and *Tenthredo ferruginiella* Wei, 2002
32 (31) At least tergite 1 with lateral white spot.
33 (36) White apical antennal segments with black line.
34 (35) Lateral lobe of mesonotum shiny. Hind femur red, inner side with black line (sometimes entirely black). Tergite 1 with lateral whitre spot , red tergite 3-4 and segments 5-6, white segments with black line.....*Tenthredo ino* Zhelochovtsev, 1961
35 (34) Mesonotum entirely matt. Otherwise similar to T. solitaria Scopoli. Hind femur red without black line.....*Tenthredo solitaria xylota* (Jakovlev, 1891)
36 (33) White apical antennal segments without black line
37 (38) Tergite 1-3 with lateral white spots. Clypeus with 2 yellowish white spot. Femora black. Abdominal tergites from tegite 3 entirely red.
.....*Tenthredo sinorufa* sp. n.
38 (37) Only tergite 1 with lateral white spot. Clypeus without 2 spots (clypeus white or black)

39 (40) Metapleuron with white spot above hind coxa.
40 (41) Clypeus white. Two species: *Tenthredo sobrina* Eversmann, 1847 (Mesonotum shiny. Hind femur mostly red.) and *Tenthredo solitaria solitaria* Scopoli, 1763 (Mesonotum matt. Hind femur black).
41 (40) Clypeus black..... *Tenthredo pamirensis pamirensis* Jakowlew, 1888
40 (39) Metapleuron without white spot. Clypeus white. First tergite with lateral white spot. Variable in colour, melanic forms may occur.
.....*Tenthredo oryssoides* Jakowlew, 1888

Table B

Antenna is black with white apex (last apical 2 segments may be black, longitudinal black line on white antennal segments may occur). Body is black and white or black and green fading to straw, sometimes reddish brown on head or thorax. Abdomen dominantly black frequently with pale (white, yellowish white or straw colored) pattern, never colored with red (or at most on apical 2 segments). Mesonotum is densely punctured matt. Wings hyaline. Abdomen never with bluish or purplish lustre and wings never with infuscate band.

1 (4) Mesonotal middle lobe is not entirely black (at least with pale hind apex or V-shaled margin or the middle part of anterior lobe is pale (and also lateral lobes are partly).
2 (3) Mesopleuron and mesepisternum are reddish brown, abdominal tergites are entirely black except anterior and posterior margines of propodeum. Middle part of mesonotal lobes are yellowish brown..... *Tenthredo kucerai* sp. n.
3 (2) Mesopleuron and/or mesepisternum is pale or at least one of them with large pale spot on the black ground color. Abdominal tergites are black but always with more pale spots. Anterior mesonotal lobe only with pale apex or with pale V-margin never yellowish brown in middle. More species, not discussed in detailes: *Tenthredo habenata* Konow, 1907; *Tenthredo pyramidata* Konow, 1898; *Tenthredo beesoni* (Malaise, 1934); *Tenthredo gangriaensis* Singh and Saini, 1988; *Tenthredo malkiati* Vasu, 2004 and *Tenthredo sanctapetronellae* Haris, 2007.
4 (1) Mesonotal middle lobe is entirely black.
5 (10) Hind tibia is red, reddish brown or brown.
6 (7) Mesopleuron, mesepisternum are brownish red, abdomen is black only with lateral white spots. Similar to *T. variicolor* Malaise.....*Tenthredo rubiapicilina* Wei, 2002
7 (6) Mesopleuron, mesepisternum and mesosternum are black.
8 (9) Scape is black. Tergites 1-5 with wide central hind margines.
.....*Tenthredo memoriaescalerai* Haris, 2004
9 (8) Scape is red. Tergites 3 and 8 are entirely white (white further: triangular spot on tergite 1, lateral spot on tergite 2, spots on tergite 4, 5 and 7).
.....*Tenthredo tricoloritonkinensis* Haris, 2006
10 (5) Hind tibia is white or yellowish white with or without apical black spot.
11 (12) The large white spot on temples and wide pale inner orbit are confluent. (Mesonotal anterior lobe is entirely black, tergites 2-7 are black with yellowish triangular spots).....*Tenthredo vatsi* Saini and Vasu, 1998
12 (11) White spot on temples is completely separated from pale inner orbit by black color.
13 (14) Apex of anterior mesonotal lobes are white, tergites 2-7 with yellowish white hind margin. Hind tibia with wide black apex.....*Tenthredo imbricata* Muche, 1983
14 (13) Anterior mesonotal lobe is entirely black. Apical 2/3 of tergites 3 and 4 are yellow and tergites 2-7 are without yellowish white hind margin. Hind tibia is without black apex.....*Tenthredo sinospeciosa* sp. n.

Fig. 7: Holotype of *Tenthredo becvari* spec. nov.

Fig. 8: Holtype of *Tenthredo ferroyunnanensis* spec. nov.

Fig. 9: Holotype of *Tenthredo rubrolineata* spec. nov.

Fig. 10. *Tenthredo ferruginea* Schrank, 1776 (local color variation)

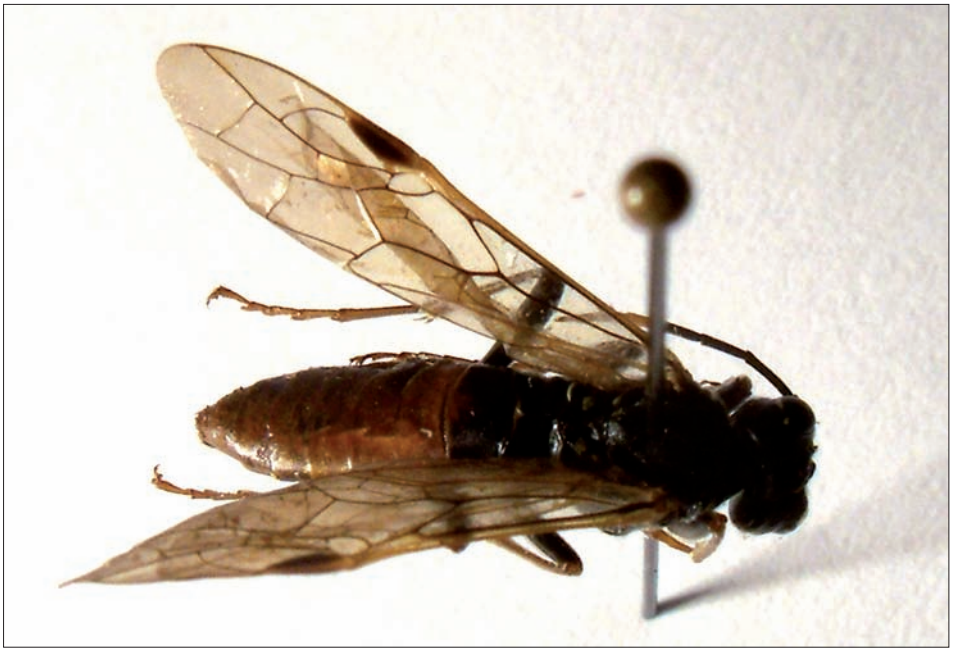

Fig. 11: Holotype of *Tenthredo sinorufa* spec. nov.

Fig. 12: Holotype of *Tenthredo sinospeciosa* spec. nov.

Fig. 13: Holotype of *Tenthredo kucerai* spec. nov.

Fig. 14: Holotype of *Tenthredo sinoabrahami* spec. nov.

Fig. 15: Holotype of *Tenthredo sinomirabilis* spec. nov.

Fig. 16: Holotype of *Tenthredo sinoflava* spec. nov.

Fig. 17: Holotype of *Tenthredo sinopotanini* spec. nov.

Fig. 18: Holotype of *Tenthredo rubropedicella* spec. nov.

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The subfamily Tenthredininae from Laos (Hymenoptera, Tenthredinidae)

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Haris, A.: *The subfamily Tenthredininae from Laos (Hymenoptera, Tenthredinidae).*
Abstract: 27 species are reported from Laos. *Pachyprotasis fabriziae* spec. nov. and *Macrophya laocoxalis* spec. nov. are described.

Keywords: Laos, Hymenoptera, Symphyta, Tenthredinidae, new species

Introduction

This is the 6th paper on the sawfly-fauna of Laos. In the early 20th century Turner (1919, 1920), published 2 papers on the former Indochina which included the present territory of Laos, based on the results of the Vitalis de Salvaza expeditions. 87 years later, Haris and Roller (2007) reported 25 sawfly species from the country including 11 new species for the science. In 2013, Haris (2013) published a study on the Tenthredo Linné, 1758 fauna of Laos. In the recent book, a new paper takes place on the Allantinae, Selandrinae and Heterathrine species. In this paper, further 27 sawfly species are reported.

Material and methods

The studied material was collected by Dr. C. Holzschuh with the help of local voluntiers. It amounts approxymately 400 specimens. For the identification of the species, we consulted the comprehensive books of Malaise 1945, Takeuchi 1937 and Saini 2007 completed with numerous papers as follows: Haris and Roller 1999a,b, 2007, Chen and Wei 2002, Nie and Wei 1999, Smith 2012, Wei and Zhong 2002, Zhong and Wei 2002, 2010, Zhu and Wei 2002 and many others.

Holotypes are deposited in the Biologiezentrum Linz, Austria.

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List of species

Beldonea impunctata Wei, 1996: Louang Phrabang pr., Ban Song Cha env., 1200 m, May 1999, 1 male.

Colochelyna fulva R.E. Turner, 1920: Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 12-13. 04. 2010, 4 females, 1 male; 09-10. 04. 2010, 3 females, 9 males; 14-18. 04. 2010, 2 females, 1 male; 06. 05. 2010, 1 female; 24. 04. 2010, 1 female; 12. 05. 2010, 2 females; 11. 04. 2010, 1 female, 1 male; 13. 05. 2011, 1 female; 03. 05. 2011, 1 female; 01. 05. 2011, 2 females, 2 males; 11. 05. 2011, 2 females; 06-18. 05. 2004, 1 female; 21. 05. 2011, 1 male; 07. 05. 2011, 4 males; 02-03. 05. 2011, 2 males; 06. 05. 2011, 2 males; 08. 05. 2011, 1 male; 27-28. 04. 2010, 1 male.

Colochelyna magrettii Konow, 1898: Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 02-03. 05. 2011, 2 females; Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 18. 05. 2011, 1 female; Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 11. 05. 2011, 2 females; Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 31. 05. 2011, 1 female; Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 21. 04. 2010, 1 female; Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 07-09. 04. 2010, 1 female; Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 27. 05. 2011, 1 female; Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 06. 05. 2010, 1 female.

Conaspidia fasciatipennis R.E. Turner, 1919: Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 30. 05. 2011, 1 female; 10. 05. 2011, 1 male.

Macrophya formosana Rohwer, 1916: Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 10. 05. 2011, 1 female; 01. 05. 2010, 1 female.

Macrophya hastulata Konow, 1898: Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 30. 04. 2010, 1 male; 28. 05. - 20. 06. 2003, 1 female; 13. 05. 2011, 1 female.

Macrophya minutifossa Wei & Nie, 2003: Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 30. 04. 2010, 1 male; 06. 06. 2009, 1 female; 01. 05. 2011, 1 female ; 26. 05. 2011, 1 female.

Macrophya pilotheca Wei & Ma, 1997: Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 10-19. 05. 2009, 1 female; 06. 06. 2009, 2 females; 12. 05. 2011, 1 female; 22. 05. 2011, 1 female.

Macrophya planata (Mocsáry, 1909): Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 20-31. 05. 2009, 1 female; 03-05. 06. 2009, 1 female.

Macrophya regia Forsius, 1930: Lao, Hua Phan prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 07. 05. 2011, 1 female, 1 female, topotypic but 08. 06. 2009; 1 female, 30. 04. 2009; 1 female, 18. 04, 2010; 1 female, 28. 05. 2011; 2 females, 17. 05. 2011; 1 female, 12. 05. 2010; 1 female, 06. 05. 2011; 1 female, 16-08. 05. 2010; 1 female, 10. 05. 2010; 1 male, 06. 05. 2011; 1 male, 21. 04. 2010; 1 male, 17. 05. 2011; 1 male, 22. 04. 2010.

Macrophya tonkinensis Malaise, 1945: Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 25. 05. 2010, 2 females.

Macrophya verticalis Konow, 1898: Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 11. 04. 2010, 1 female; 02-03. 05. 2011, 1 male.

Neocolochelyna rufidorsata (Malaise, 1937): Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 11. 05. 2011, 1 female; 07. 05. 2011, 1 female; 21. 05. 2011, 1 female.

Pachyprotasis alboannulata Forsius, 1935: Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 16. 05. 2011, 1 female; 10. 05. 2011, 1 female.

Pachyprotasis citrinipicta Malaise, 1945: Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 04. 05. 2011, 3 females, 11 males; 25-26. 04. 2010, 1 female; 07. 05. 2011, 2 females, 2 males; 30. 04. 2010, 1 female; 02-03. 05. 2011, 4 females, 2 males; 08. 05. 2011, 1 female, 1 male; 27-28. 04. 2011, 1 female, 1 male; 28-29. 04. 2010, 1 female, 1 male; 22-23. 05. 2010, 1 female; 05. 05. 2011, 2 females, 2 males; 01. 05. 2010, 3 females; 21. 04. 2010, 1 female, 1 male; 25. 05. 2010, 1 female; 16-18. 05. 2010, 1 female; 06. 05. 2011, 3 females, 8 males; 28-29. 04. 2010, 1 female; 10. 05. 2011, 2 females, 4 males; 01. 05. 2011, 1 female; 05. 05. 2010, 1 female; 19. 04. 1020, 1 female; 21. 05. 2011, 1 female; 11. 05. 2011, 3 males; 30. 04. 2010, 1 male; 15. 05. 2011, 1 male; 28. 04. 2010, 1 male; 30. 05. 2011, 1 male; 12. 05. 2011, 1 male; 19. 04. 2010.

Pachyprotasis flagellaris Saini and Smith, 2007: Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 06. 05. 2011, 1 male.

Pachyprotasis flavipes (Cameron, 1902): Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 01. 05. 2010, 1 male.

Pachyprotasis foveata M.S. Saini & Vasu, 1998: Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 11. 05. 2011, 1 female; 30. 04. 2010, 1 female.

Pachyprotasis multilineata Malaise, 1945: Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 12. 05. 2011, 1 female; 13. 05. 2011, 1 female.

Siobla fulvolobata Malaise, 1945: Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 10-19. 05. 2009, 1 female; 14-15. 05. 2010, 1 female; 19. 05. 2011, 1 female; 29. 05. 2011, 1 female; 30. 05. 2011, 1 female; 13. 05. 2010, 4 males; 31. 05. 2011, 1 male; 21. 05. 2011, 1 male; 12. 05. 2010, 2 males; 27. 05. 2011, 1 male; 28. 05. 2011, 1 male; 18. 04. 2010, 1 male; 09. 05. 2010, 1 male; 10-22. 05. 2011, 3 males; 27. 05. 2011, 1 male; 10. 05. 2011, 1 male; 01. 06. 2011, 1 male; Hua Phan pr., Mt Phu Pane, cc. 1500 m, 20°12'N, 103°59'E, 10-22. 05. 2011, 1 female; 01-20. 06. 2011, 1 male.

Siobla punctata (Cameron, 1899): Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 19. 05. 2011, 1 female; Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 06. 05. 2011, 1 female, 2 males; Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 08. 05. 2011, 1 male.

Siobla mooreana Cameron, 1877: Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 11. 05. 2011, 1 female; 21. 05. 2011, 1 female, 1 male; 16-18. 05. 2010, 1 male; 10. 05. 2011, 1 male; 27. 05. 2011, 1 male; 08. 05. 2011, 1 male; Phongsaly pr., Phongsaly env., 21°41'N, 102°06'E, cc. 1500 m, June 2003, 1 female; 28. 05.-20. 06. 2003, 1 male.

Siobla insularis Malaise, 1945: Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 19. 04. 2010, 2 males; 14-08. 04. 2010, 1 male; 20. 04. 2010, 1 male; 10. 05. 2010. 2 males; 02-03. 05. 2011, 1 male; 27-28. 04. 2011, 1 male.

Siobla maxima R.E. Turner, 1920: Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 30. 04. 2010, 1 female; 10. 05. 2011, 1 female; 30. 04. 2010, 1 female; 10-22. 05. 2011, 1 female; 27-28. 04. 2011, 1 female; 13. 05. 2011, 1 female; 02-03. 05. 2011, 1 female; 08. 05. 2011, 1 female; 30. 05. 2011, 1 female; 27-28. 04. 2011, 1 female.

Tenthredo (*Propodea*) *spinosa* Cameron, 1899: Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 06. 05. 2010, 1 female; 10. 05. 2011, 1 female; 24. 04. 2010, 1 female; 06-18. 05. 2004, 1 female; 16-18. 05. 2010, 1 female; 21. 05. 2010, 1 male; 07-09. 04. 2010, 1 male; 18. 04. 2010, 1 male; 28. 04. 2010, 1 male.

Descriptions of the new species

Pachyprotasis fabriziae spec. nov. (Figs. 1 and 3)

Holotype: male, Lao, Hua Phan prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 06. 05. 2011, leg. C. Holzschuh and locals.

Male. Head pale straw coloured (green in life), eyes surrounded with narrow white ring (excpet upper third). Vertex and ocellar area with black spot covering half of frontal area, not reaching eyes and temples. Antenna black, 3-5 antennal segments green below. Labrum blackish green. Mouthparts straw (green) coloured. Thorax straw (green in life); black: wide hind margin of pronotum, triangular central spot of anterior lobe of mesonotum, lateral lobes of mesonotum nearly entirely, except narrow margins, 2 large spots next to mesoscutellum, sunken area behind mesoscutellum, spot behind metascutellum, small spot on metapleuron and small spot on gently elevated part of mesopleuron. Upper third of mesopleuron with triangular white spot. Legs green; black: longitudinal line on fore and middle femora, tibia and tarsi, short apical line on hind femur, hind tibia totally except white wide subapical ring, basal third of hind basitarsus, apices of hind tarsal segments. Abdomen green; black: basal and lateral part of propodeum, tergites 2-5 except hind, central triangular spots, tergites 6-8 with lateral black spots. Wings hyaline, costa, subcosta, stigma brown, lower basal quarter of stigma transparent, venation blackish brown. Head shiny with sporadic, moderately large and shallow punctures. Frontal area with shallow, moderately dense, irregular punctures. Gena very wide, 2,5x wider than diameter of anterior ocellus. Clypeus and labrum extremely elongated. Combined length of labrum and clypeus : length of 3rd antennal segment: 1.0 : 1.0. OOL : POL : OCL: 12 : 5 : 10. Ratios of antennal segments: 10 : 5 : 40 : 45 : 45 : 31 : 25 : 34 : 29. Antenna about as long as whole body. Postocellar carina missing on lateral part of head, sligthly but visibly developed behind temples and vertex. Mesonotal lobe minutely, shal-

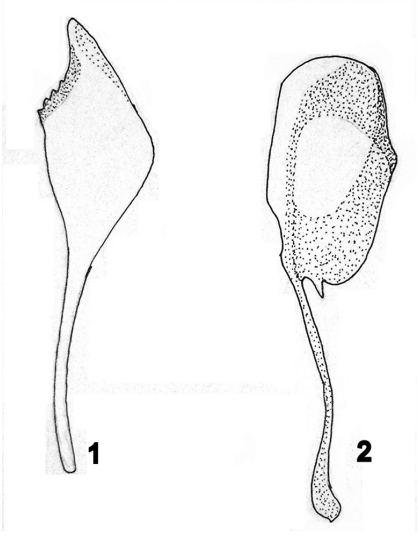

Fig. 1: Penis valve of *Pachyprotasis fabriziae* spec. nov.
Fig. 2: Penis valve of *Macrophya laocoxalis* spec. nov.

Fig. 3: *Pachyprotasis fabriziae* spec. nov. holotype

lowly and densely punctured, moderately shiny. Interspaces between puncture about 2/3x as large as diameter of a puncture. Mesoscutellum, mesoscutellar appendage and metascutellum smooth and shiny. Mesopleuron densely punctured with moderately deep and moderately large punctures, shiny, interspaces between punctures about half as large as diameter of a puncture. Mesoscutellum bluntly elevated with 3 not sharp carina from center to sides. Propodeum smooth and shiny in central part, other tergites and sides of propodeum with moderately sparse, shallow, moderately large punctures, moderately shiny. Claws without basal lobe, apical and subapical teeth subequal. Length of inner hind tibial spur : length of hind basitarsus: 39 : 60. Penis valve in Fig. 1. Length: 9.4 mm.

The new species is dedicated to Dr. Fabricius Turrisi.

In structure of penis valve, the new species related to *Pachyprotasis alboannulata* Forsius, 1935 Fig. Compare Fig. 421 in SAINI 2007. In other points of view like colour, body strructure and surface sculpture the 2 species different.

In the keys of MALAISE 1945 and SAINI 2007, the new species runs to *Pachyprotasis pallens* Malaise, 1945. The colour pattern and penis valve of the 2 species are strickingly differnet compare Figs. 197 and 464 in SAINI 2007 with Figs 1 and 3).

It is also similar to *Pachyprotasis rufigaster* Zhong & Wei, 2010, however, the abdomen is not rufous of the new species. Hind femur and hind tibia are black in the new species. These are pale in *Pachyprotasis rufigaster*, except apical third of abdomen and ring on the apex of hind tibia. Furthermore 3rd antennal segment (flagellomere 1) sig-

nificantly longer than 4th (flagellomere 2); these segments are equal in the new species. The frontal spots of the 2 species are also completely different.

Macrophya laocoxalis spec. nov. (Fig. 2)

Holotype: male, Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 27. 05. 2011, leg. C. Holzschuch and locals.

Male: head black; white: clypeus and labrum entirely, basal half of mandible. Antenna entirely black. Thorax and abdomen black only cenchry whitish yellow. Coxae whitish yellow but outside of hind coxa black. All trochanters whitish yellow. Anterior and middle femora and tibiae whitish yellow all with longitudinal black line. Hind femur and tibia black, basal quarter of hind femur whitish yellow. Anterior and middle tarsi brownish yellow, apices of middle tarsal segments black. Hind tarsus black. Wings hyaline, apical part gently brown infumated, stigma, costa, subcosta and venation dark brownish black. Head including frontal area, temples and vertex deeply, densely punctured with large punctures, moderately shiny, temples with large smooth and shiny areas next to postocellar furrows. Postoccipital carina reaching up to 2/3 of eyes. Gena linear. Pentagonal frontal area not indicated. Clypeus shallowly and rectangularly emarginated, clypeal emargination about 0.25x as deep as clypeal median length. Apex of labrum rounded. Head strongly contracted behind eyes. Length and width of postocellar area: 1 : 2. OOL : POL : OCL: 12 : 6 : 10. Antenna about as long as head, thorax and first 2 abdominal segments (propodeum and first tergite) combined. Ratios of antennal segments 1-9: 10 : 5 : 29 : 19 : 19 : 15 : 15 : 15 : 18. Mesonotal lobes deeply, densely and uniformly punctured with large punctures. Interspaces between punctures about half as large as a diameter of a puncture, moderately shiny. Mesoscutellum and mesoscutellar appendage very densely pounctured with uniformly deep and large punctures. Basal part of metascutellum smooth and shiny, apical part with dense, large and deep punctures. Mesopleuron densely and deeply punctured with large pounctures, shiny, interspaces between punctures about 1-3x as large as diameter of a punctures. Mesoscutellum gently convex, blunt without carina. Metepimeron with oval shaped basin and without appendage. Anal cell of fore wing widely contracted. Abdominal tergites 1-3 smooth and shiny, other tergites with sporadic punctures. Length of hind basitarsus : length of inner hind tibial spur: 44 : 25. Claws without basal lobe, subapical and apical tooth subequal, subapical tooth wider. Penis valve in Fig. 2. Length: 7.6 mm.

According to ZHOU and WEI 2009, the new species belongs to the coxlis group. In the key of ZHOU and WEI 2009 and also in TAKEUCHI 1937, the new species would run to *Macrophya coxalis* Motschulsky, 1866. Differences: penis valve different compare Fig. 2 and Fig. 30 in TAKEUCHI 1937. In *M. coxalis* Takeuchi, hind margin of pronotum and basal half of tegula yellow and legs dominantly black, more yellow coloure takes place in the new species.

In the key of SAINI 2007, the new species would run to *Macrophya verticalis* Konow, 1898, however the penis valve of the 2 species are completely different, compare Fig. 514 in SAINI 2007 and Fig. 2.

In MALAISE 1945, the new species runs to *Macrophya formosana* Rohwer, 1916. Shape of penis valve of the 2 species are also completely different (compare Fig. 515 in SAINI 2007 and Fig. 2), also *M. formosana* Rohwer is more richly coloured with yellow.

Corrections of mistakes in 2 previous papers

In HARIS, A. 2013: The genus Tenthredo (Linné, 1758) in Laos. - Natura Somogyiensis 23: 189-210, the type data of *Tenthredo nigromandali* Haris, 2013 is missing. Hereby, I submit the date and place of capture of the holotype: Holotype: female: Laos, Prov. Hua Phan, Phou Pan Mt., Ban Saleui Village, 20°13'30"N, 103°59'26"E,1350-1900 m, 02-03. 05. 2011, leg. C. Holzschuh and locals.

In HARIS, A. 2012: Sawflies from China and Indonesia (Hymenoptera: Tenthredinindae) - Natura Somogyiensis 22: 111-122, the holotype data of *Pristiphora* (*Pristiphora*) *achterbergi* Haris, 2012 published erroneously, the correct holotype data: Holotype, female: S. China, Hunan, nr. Chengbu, Nan Mt. 1300 m, virgin forest trail, near entrance park, 11. 06. 2009, C. v. Achterberg.

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The sawfly subfamilies Blennocampinae and Nematinae from Laos (Hymenoptera: Tenthredinidae)

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Haris, A.: *The sawfly subfamilies Blennocampinae and Nematinae from Laos (Hymenoptera: Tenthredinidae).*
Abstract: 14 Blennocampinae and Nematinae sawfly species are reported from Laos. *Blennocampa gusenleitneri* spec. nov. and *Pristiphora kubani* spec. nov. are described.

Keywords: Hymenoptera, Tenthredinidae, Laos, new species

Introduction

This is the 7th paper on the sawfly-fauna of Laos. The investigation of the sawflies of the country was iniciated by (Turner 1919, 1920) who published 2 papers on the former Indochina which included the present territory of Laos, based on the results of the Vitalis de Salvaza expeditions. 87 years later, Haris and Roller (2007) reported 25 sawfly species from the country including 11 new species for the science. In 2013, Haris (2013) published a study on the *Tenthredo* Linné, 1758 fauna of Laos. In the recent book, further 3 papers take place including the Blennocampinae and Nematinae species. In this paper, further 14 sawfly species are reported.

Material and methods

The studied material was collected by Dr. C. Holzschuh, J. Bezedek, E. Jendek and V. Kuban with the help of local voluntiers between 1999 and 2011. It amounts 35 specimens. For the identification of the species, we consulted the comprehensive works of Haris 2006a,b, Saini 2006 and Wei 1994 completed with numerous papers as follows: Haris and Roller 1999, 2007, Niu and Wei 2009, Wei 1994, 2006, Wei and Lin 2005, Wei and Nie 1998, 2003, 2003, Xiao et al. 1997 and many others. Holotypes are deposited in the Biologiezentrum Linz, Austria.

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List of species

Blennocampinae

Eutomostethus albotegularissimus Haris, 2006: 1200 m, Louang Phrabang pr., Ban Song Cha env., May 1999, 1 female.

Eutomostethus minutus M.S. Saini & Vasu, 1996: Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 11. 05. 2011, 1 female; 01. 06. 2011, 1 female; 30. 05. 2011, 1 female; Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°15' N, 104°02', 1500-2000 m, 26. 04-11. 05. 2001, 1 female.

Eutomostethus metallicus (Sato, 1928): Boli Kham, Xai prov., 18°21'N, 105°08'E, Hua Phan Prov., Ban Nape (8 km NE), 01-18. 05. 2001; Louang Phrabang pr., Ban Song Cha env., 1200 m, May 1999, 1 male.

Eutomostethus thaianus (Togashi, 1982): Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 11. 05. 2011, 1 female; 12. 05. 2010, 1 female.

Neoclia siametica (Forsius, 1933): Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 17. 05. 2011, 1 female; 08. 05. 2011, 1 female; 05. 05. 2011, 1 female; 10-22. 05. 2011, 1 male.

Senoclidea decora (Konow, 1898): Hua Phan prov., Phu Loei N. P. Ban Sakok, 20°10'N, 103°12'E, 23-26. 05. 2001, 1 male; Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 14-06. 06. 2009, 1 female;

Siniara bicolor Malaise, 1964: Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 01. 05. 2010, 2 females, 1 male; 30. 04. 2010, 1 female; 20. 04. 2010, 1 female; 02-03. 05. 2011, 3 females; 06. 05. 2011, 1 female; 10-22. 05. 2011, 1 female; 11. 05. 2011, 1 female; 08. 05. 2011, 1 female, 01. 05. 2011, 2 males; 05. 05. 2011, 1 male.

Monophadnus bicoloritonkinensis Haris, 2006 (description of the unknown male) Laos NE., Hua Phan prov., Ban Saluei: Phu Phan Mt., 20°15'N, 104°02'E, 1500-2000 m, 26. 04.-11. 05. 2001, J. Bezedek leg.

Head and antenna black, white: wide anterior margin of clypeus, labrum and palpi (basal 2 joints of palpus mandibularis brownish white). Thorax black, yellow: hind and lateral margin of pronotum, tegula. Cenchri brownish white. Coxae reddish yellow with black base, trochanters white, femora reddish yellow, apically white, base of anterior and middle tibiae white, other parts of tibiae whitish brown. Hind tibia dominantly white, apex whitish brown with narrow black apical line. Anterior and middle tarsi whitish brown, hind tarsi black. Clypeus truncate. Hind margin of propodeum, tergites 2-5 and sides of tergite 6 and sternites 2-6 yellowish red, other parts of propodeum and abdomen black. Wings moderately brown infuscate. Costa, subcosta, stigma and venation blackish brown. Head contracted behind eyes. Gena linear. Head smooth and shiny. Frontal area sunken. Supraantennal tubercles large, about as large as median ocellus. OOL : POL : OCL: 9 : 5 : 7. Antenna thick and short, shorter than head and thorax combined (about as long as head and partly thorax till end of mesoscutellar appendage), relatively thick. Ratios of antennal segments: 10 : 9 : 20 : 15 : 15 : 12 : 10 : 10 : 11. Postosccipital carina weekly developed reaching up to middle of eyes. Frontal area laterally well bordered with paralell blunt ridges. Basal and first recurrent wein subparalell. Number of cubital cells 4. Cubital vein of anterior wing straight and simple. Hind wing without closed middle cells. Anal cell of hind wing with long petiole. Nervulus of hind wing runing into petiole of anal cell far from apex of anal cell. Mesonotal lobes, mesoscutellum, mesoscutellar appendage, metascutellum and mesopleuron smooth and shiny. Mesoscutellum flat. Membraneous triangular spot of propodeum well developed. Mesopleuron without

prepectus (but postspiracular sclerite well separated by deep furrow). Propodeum smooth and shiny. Other tergites with fine, shallow surface sculpture, shiny. Anterior tibial spur bifurcate. Claws without basal lobe with minute inner tooth in midle. Length of inner hind tibial spur : length of hind basitarsus: 4 : 15. Length: 5.0 mm.

Nematinae

Cladius (*Priophorus*) *brullei* (Dahlbom, 1835): Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 04. 05. 2011, 1 male.

Craesus orientalis Rohwer, 1921: Phongsaly prov., Phongsaly, cca. 1500 m., 21°41' N, 102°06' E, 28. 05.-20. 06. 2003, 1 female.

Pristiphora chalybeata Benson, 1963: Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 30. 05. 2011, 1 female.

Pristiphora longitangia Wei & Nie, 1998: Phongsaly prov., Phongsaly, cca. 1500 m., 21°41' N, 102°06' E, 28. 05.-20. 06. 2003, 1 female.

Descriptions of the new species

Blennocampa gusenleitneri spec. nov. (Figs. 2, 3 and 4)

Holotype: female, Laos centr., Boikhamsai prov., Pakkading env., 18°19'N, 103°59'E, Nov. 2000, E. Jendek leg. Paratype: female, topotypic.

Head black, labrum brown, palpi yellowish white. Antenna black, scape yellowish brown, pedicell dark brown. Thorax and abdomen black, wide hind corner of pronotum and tegula yellowish white. All legs from base of coxa till last tarsal segments completely yellowish white only narrow apical ring of hind tibia pale brown. Wings subhyaline, stigma, costa, subcosta and veins dark brown. Ratios of antennal segments: 10 : 10 : 20 : 16 : 16 : 10 : 8 : 7 : 7. Pedicell elongated. Ocelli far from each other. OOL : POL : OCL: 9 : 10 : 9. Gena nearly linear, about 0,4x time as wide as diameter of anterior ocellus. Frontal area not bordered only gently elevated. Clypeus slightly and widely emarginated, clypeal emargination about 0.3x as deep as clypeal median length. Frontal area densely and moderately deeply punctured with moderately large punctures, shiny. Temples and vertex shiny, with sparser punctures, moderately deeply and sporadically wrinkled, shiny. Postoccipital carina very short, hardly reaching lower corner of eye. Mesonotal lobes nearly smooth and shiny, with moderately large, sporadic, shallow punctures. Mesoscutellum, mesoscutellar appendage, metascutellum and mesopleuron smooth and shiny. Mesoscutellum flat. Prepectus absent. Number of cubital cells 4. Vein 2A+3A straight. Hind wing without closed middle cell. Radial cell of hind wing closed. Hind wing without closed middle cell. Anal cell of hind wing with long petiole. Abdomen shiny from 2nd tergite with undefined fine surface sculpture. Inner hind tibial spur short. Sawsheath in Fig. 2. Length of inner hind tibial spur : apical width of hind tibia : 1.0 : 1.0. Basitarsus as long as other 4 tarsal joint combined (except claw). Claws without basal lobe, subapical tooth slightly shorter than apical (Fig. 3). Length: 4.4 mm.

The new species is dedicated to Dr. Fritz Gusenleitner

For long time, only *Blennocampa pusilla* (Klug, 1816) represented the only *Blennocampa* Hartig, 1837 species. This species is also known as *Blennocampa phyl-*

locolpa Viitasaari & Vikberg, 1985. Since *B. pusilla* (Klug) is an important pest of horticulture and this pest is a subject of agricultural plant protection in universities, we suggest to preserve the original name given by Klug. Two other recently described oriental species are also completely correspond to the generic definition of genus *Blennocampa* Hartig, 1837 given by ZOMBORI (1990): Both recurrent veins of anterior wing runs into different cells. Basal vein and first recurrent veins are paralell. Basal and cubital veins on subcosta meet closer than distance of cubital vein from base of stigma. Prepectus is not separated. 2A+3A is straight and simple. Gena is narrower than diameter of anterior ocellus. Third antennal segment is not longer than 3 apical antennal segment combined. Body is small, max. 4.5 mm. Pedicell is longer than wide and 3rd antennal segment is longer than 4th. Hind wing is without closed middle cell. Anal cell of hind wing is with long petiole. The totally white legs clearly differ the new species from *Blennocampa pusilla* (Klug, 1816) and *Blennocampa laosensis* Haris & Roller, 2007, (anterior 4 femora black in *B. laosensis*) and also the wide white hind corner of pronotum.

Pristiphora kubani spec. nov. (Figs. 1 and 5)

Holotype: male, Laos, Phongsaly prov., 21°41'N, 102°06'E, Phongsaly env., 06-17. 05. 2001, cc. 1500 m., Vit. Kuban leg.

Male. Head black, labrum and base of mandible brown, palpi white. Antenna brown. Thorax completely blackish brown, only parapteron and cenchri white. All legs completely white from coxae till tarsi. Abdominal tergites dark brown, tergites 1-3 with large lateral white spot, tergite 4 with small lateral white spot. Abdominal sternites white except last black sternite. Head subparalell behind eyes. Shiny with minute, moderately dense punctures. Frontal area densely, finely punctured, moderately shiny. Pentagonal frontal area flat, not elevated, not marked with ridges. Ratios of antennal segments: 5 :

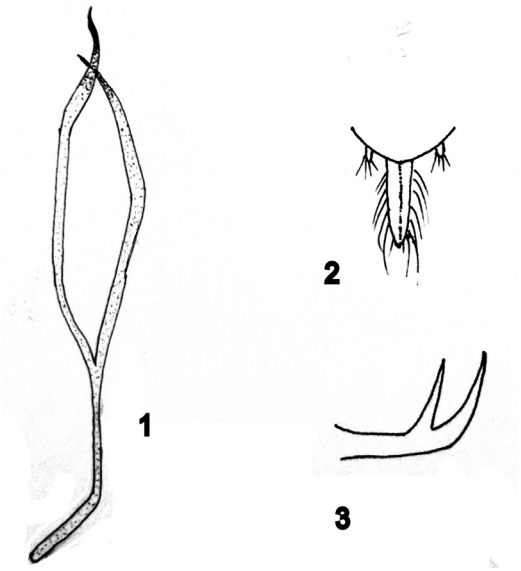

Fig. 1: Penis valve of *Pristiphora kubani* spec. nov.; Fig. 2: Sawsheath of *Blennocampa gusenleitneri* spec. nov.; Fig. 3: Claw of *Blennocampa gusenleitneri* spec. nov.

Fig. 4: ***Blennocampa gusenleitneri*** **spec. nov. holotype**

Fig. 5: ***Pristiphora kubani*** **spec. nov. holotype**

4 : 19 : 17 : 16 : 13 : 11 : 11 : 14. Length of 3rd antennal segment: longest diameter of eye: 19 : 23. Antenna as long as head and thorax (including propodeum) combined. OOL : POL : OCL: 8 : 10 : 6. Clypeus truncate. Gena about 0.3x as wide as diameter of front ocellus. Wings hyaline, costa, subcosta, stigma and venation blackish brown all of them has same color. Propodeum smooth and shiny, other abdominal tergites with fine surface sculpture, shiny. Inner hind tibia short. Length of inner hind tibia : length of hind basitarsus: 6 : 20. Hind basitarsus shorter than other hind tarsal segments: 5.0 : 6.0. Penis valve in Fig. 1. Length: 5.2 mm.

The new species is dedicated to Mr. Vit Kuban.

In HARIS 2006, the new species is related to 3 species which can be differentiated only by penis valve, namely *Pristiphora pallidiventris* (Fallén, 1808), *Pristiphora sauteri* Rohwer, 1916 and *Pristiphora cretica* W. Schedl, 1981. The penis valve of the new species is very special and not similar to any other species of the genus. (Compare Fig. 1 and Figs. 94, 140 and 144 in HARIS 2006).

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The sawfly subfamily Allantinae, Selandrinae and Heterarthrinae from Laos (Hymenoptera: Tenthredinidae)

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Haris, A.: *The sawfly subfamily Allantinae, Selandrinae and Heterarthrinae from Laos (Hymenoptera: Tenthredinidae).*

Abstract: 77 species are reported from Laos. Fifteen new species are described: *Apethymus turrisii* spec. nov., *Beleses gusenleitneri* spec. nov., *Caliroa laoparvula* spec. nov., *Caliroa laonigrissima* spec. nov., *Caliroa laominuta* spec. nov., *Denticornia laoensis* spec. nov., *Emphystegia pseudomaculata* spec. nov., *Heptamelus kubani* spec. nov., *Neostromboceros kubani* spec. nov., *Neothrinax phoupanensis* spec. nov., *Ridgea laoensis* spec. nov., *Taxonus laoensis* spec. nov., *Taxonus rubroscapus* spec. nov., *Taxonus albotemplis* spec. nov. *and Taxonus sanctifloriani spec. nov.* Further 36 species are new records for Laos. Members of *Beleses multipicta* (Rohwer, 1916) group are keyed and compared.

Keywords: Laos, Hymenoptera, Symphyta, Tenthredinidae, new species

Introduction

Only few papers were published on the sawfly fauna of Indochina in the early 20th century (Turner 1919 and 1920), which included the present territory of Laos, based on the results of the Vitalis de Salvaza expeditions. 87 years later, Haris and Roller (2007) reported 25 sawfly species from the country including 11 new species for the science. In this paper, 69 sawfly species are published collected by Dr. Eduard Jednek, Dr. Ondrej Sausa and Dr. Roman Hergovits.

Material and methods

Most of the studied material was collected by Dr. C. Holzschuh and in smaller part by Dr. Vit Kubán with the help of local voluntiers. It amounts approxymately 500 specimens. For the identification of the species, we consulted the comprehensive books of Saini 2006a,b and c completed with numerous papers as follows: Haris 2006, 2008, Haris and Roller 1999, 2007a,b, Koch 1988, Malaise 1944, 1963, Niu and Wei 2009, Saini and Vasu 2001, Smith and Saini 2003, Wei 1997a,b, Wei and Nie 1997, 1998, Wei and Xiao 2002, Wei and Zhu 1999, Zhu and Wei 2008.

Holotypes are deposited in the Biologiezentrum Linz, Austria, some paratypes are in Rippl-Rónai Museum, Kaposvár, Hungary.

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List of species

Allomorpha incisa Cameron, 1876: Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 17. 05. 2011, 3 females; 02-03. 05. 2011, 1 female, 1 male; 14-15. 05. 2010, 1 female; 16-18. 05. 2010, 1 female; 01. 05. 2010, 2 females; 03-04. 05. 2010, 1 female; 01. 05. 2011, 1 female; 18. 05. 2011, 2 females; 19. 05. 2011, 1 female; 24. 05. 2011, 1 female, 1 male; 22. 05. 2011, 1 female; 21. 05. 2011, 1 female, 1 male; 01. 05. 2010, 1 female; 05. 05. 2011, 1 female; 07. 05. 2011, 1 female, 2 males; 20. 05. 2011, 2 females; 13. 05. 2011, 1 female; 04. 05. 2011, 2 males; 31. 05. 2011, 2 males.

Beleses multipictus (Rohwer, 1916): Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,05. 05. 2011, 1 male.

Beleses nigropilosus Wei and Niu, 2012: Phongsaly prov., Phongsaly, 21°41-42'N, 102°06-08'E, 1500 m, 28. 05. – 20. 06. 2003, 1 female.

Beleses stigmaticalis (Cameron, 1876): Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,05. 05. 2011, 1 female.

Eusunoxa major (Wei, 2003): Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,08. 06. 2009, 1 male.

Eusunoxa formosana Enslin, 1911: Bolikhamsai province, Ban Nape env., 350 m, 07-16. 05. 2004, 18º 20' N 105º 08' E, 2 males.

Eusunoxa semipunctata Smith & Saini, 2003: Khammouan province, Ban Khoun Ngeun, 250 m, 18º 07' N 104º 29' E.

Taxonus shanicus (Malaise, 1957): Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,08. 05. 2011, 1 female; 10. 05. 2011, 2 females; 02-03. 05. 2011, 1 female; 29. 05. 2011, 1 female; 27. 05. 2011, 1 female; 15. 05. 2011, 1 male; Bolikhamsai prov., Ban Nape env., 350 m, 18°20'N, 105°08'E, 07-16. 05. 2004, 1 male; Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,12. 05. 2011, 1 male; 04. 05. 2011, 1 male; Louang Phrabang prov., Ban Song Cha env., 1200 m, May of 1999, 1 male; Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,16. 05. 2011, 1 female.

Nepala incerta (Cameron, 1876): Boli Kham Xai prov., Ban Nape 8km NE, 18°21'N, 105°08'E, 600 m, 01-18. 05. 2001, 6 males; Louang Phrabang prov., Ban Song Cha env., 1200 m, May 1999, 3 males; Boli Kham Xai prov., Ban Nape 8km NE, 18°21'N, 105°08'E, 350 m, 07-16. 05. 2004, 1 male; Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,10-09. 05. 2009, 2 males; 13. 05. 2010, 1 female, 21. 05. 2011, 1 female, 03-05. 06. 2009, 1 female, 06. 05. 2011, 1 female.

Rhoptroceros malaisei (Wei and Wang, 1995): Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,01-03. 06. 2009, 1 female; 06. 06. 2009, 1 female; 24. 05. 2011, 1 male; 22-23. 05. 2010, 1 male; 08. 06. 2009, 1 male; 10. 06. 2009, 1 female.

Allantus (*Emphytus*) *nigrocaeruleus* (F. Smith, 1874): Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,26. 05. 2011, 1 female.

Canonias inopinus inopinus Konow, 1900: Phongsaly prov., Phongsaly, 21°41-42'N, 102°06-08'E, 1500 m, May-June 2003, 1 female; 06-17. 05. 2004, 2 females, 1 male; 28. 05. – 20. 06. 2003, 1 male; Louang Phrabang prov., Ban Song Cha env., 1200 m, May 1999, 2 females, 3 males; Oudom Xai, 17 km, 20°45'N, 102°09'E, 1100 m, 01-09. 05. 2002, 1 male; Louangnamtha prov., Namtha: Muang Sing, 21°09'N, 101°19'E, 05-31. 05. 1997, 2 males; Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,01-03. 06. 2009, 1 male.

Athlophorus gracilis gracilis (Konow, 1898): Ban Houaykong, 18-30. 04. 1999, 1 male; Louang Phrabang prov., Ban Song Cha env., 1200 m, May of 1999, 2 males.

Athlophorus mimicarius Malaise, 1947: Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 30. 05. 2011, 1 female; Boli Kham Xai prov., Ban Nape 8km NE, 18°21'N, 105°08'E, 600 m, 01-18. 05. 2001, 1 female.

Athlophorus perplexus perplexus (Konow, 1898): Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 04. 05. 2011, 1 female; Bolikhamsai prov., Ban Nape env., 350 m, 18°20'N, 105°08'E, 07-16. 05. 2004, 1 male; Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 01. 05. 2010, 1 female; 18. 05. 2011, 1 female; 17. 05. 2011, 1 male; 06. 06. 2009, 1 female; 27-28. 04. 2011, 1 male.

Athlophorus placidus (Konow, 1898): Bolikhamsai prov., Ban Nape env., 350 m, 18°20'N, 105°08'E, 07-16. 05. 2004, 7 females.

Beleses nigrolividus Wei, 2002: Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,08. 05. 2011, 1 female; Phongsaly prov., Phongsaly, 21°41-42'N, 102°06-08'E, 1500 m, 28. 05. – 20. 06. 2003, 1 female

Mallachiella rufithorax Malaise, 1934: Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,27-28. 04. 2011, 1 female; Louang Phrabang prov., Ban Song Cha env., 1200 m, May of 1999, 1 female; Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,21-22. 04. 2010, 1 female; 02-03. 05. 2011, 1 male; 04. 05. 2011, 1 male; 21. 05. 2011, 1 male; 07-09. 04. 2010, 1 male.

Xenapatidea tricolor Malaise, 1957: Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 11. 05. 2011, 1 female; 19. 05. 2011, 1 female; 14-16. 06. 2009, 1 female; Oudom Xai, 17 km, 20°45'N, 102°09'E, 1100 m, 01-09. 05. 2002, 1 female.

Busarbia hoaensis Haris, 2012: Phongsaly prov., Phongsaly, 21°41-42'N, 102°06-08'E, 1500 m, 28. 05. – 20. 06. 2003, 9 females, 2 males; Louang Phrabang prov., Ban Song Cha env., 1200 m, May 1999, 1 female; Phongsaly prov., Phongsaly, 21°41'N, 102°06'E, 1500 m, 06-17. 05. 2004, 3 females, 4 males.

Busarbia formosana (Rohwer, 1916): Boli Kam Xai prov., Ban Nape 8km NE, 18°21'N, 105°08'E, 600 m, 01-18. 05. 2001, 1 female.

Darjilingia weii M.S. Saini, Blank & D.R. Smith, 2006: Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 10. 05. 2011, 1 female.

Darjilingia vietnamensis Haris, 2006: Bolikhamsai prov., Ban Nape env., 350 m, 18°20'N, 105°08'E, 07-16. 05. 2004, 1 female.

Darjilingia hoangliensis Haris, 2006: Phongsaly prov., Phongsaly, 21°41-42'N, 102°06-08'E, 1500 m, 28. 05. – 20. 06. 2003, 1 female; Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 16. 05. 2011, 1 female.

Busarbidea thaiana Togashi, 1988: Oudom Xai, 17 km, 20°45'N, 102°09'E, 1100 m, 01-09. 05. 2002, 1 female.

Busarbidea pedicellidea Wei & Nie, 1998: Boli Kam Xai prov., Ban Nape 8km NE, 18°21'N, 105°08'E, 600 m, 01-18. 05. 2001, 1 female.

Clypea sinobirmana Malaise, 1961: Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 10. 05. 2011, 1 female.

Hemathlophorus foveatus M.S. Saini & Vasu, 1996: Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 11. 05. 2011, 1 female.

Xenapatidea nigrissima Haris & Roller, 2007: Phongsaly prov., Phongsaly, 21°41'N, 102°06'E, 1500 m, June 2003, 1 male.

Taxonus formosacola (Rohwer, 1916): Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 11. 05. 2011, 2 females.

Taxonemphytus fulvus Malaise, 1947: Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 12. 05. 2011, 1 female; 10. 05. 2011, 2 females; 10. 05. 2011, 1 male; 24. 05. 2011, 1 male; 08. 05. 2011, 1 male; 30. 05. 2011, 1 male; 05. 05. 2011, 1 male; 08. 05. 2011, 1 male; 06. 05. 2011, 1 female; 07. 05. 2011, 1 female.

Ametastegia (*Protemphytus*) *formosana* (Rohwer, 1916): Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 11. 05. 2011, 1 male.

Caliroa angustata Forsius, 1927: Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,01. 05. 2011, 1 female; 27-28. 04. 2011, 1 female; 07. 05. 2011, 1 female; 01. 06. 2011, 1 female.

Caliroa bilobatina Wei, 2002: Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,14-16. 06. 2009, 1 female.

Caliroa curvata Wei, 1997: Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,02-03. 05. 2011, 1 male; Ban Houaykong, 18-30. 04. 1999, 1 male.

Caliroa glabrifrons Malaise, 1961: Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,10. 05. 2011, 2 females.

Caliroa megomma Wei, 1997: Hua Phan Prov., Ban Saleui, Phou Pan Mt., 18°07'N, 104°29'E, 02-03. 05. 2011, 1 female.

Caliroa siamana Togashi, 1982: Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,19. 05. 2011, 1 female.

Caliroa tenuicornis Wei, 1997: Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 01. 05. 2010, 1 female.

Caliroa vietnamensis Haris, 2008: Khammouan prov., Ban Khoun Ngeun, 250 m, 18°07'N, 104°29'E, 20-29. 05. 2004, 1 female.

Neostromboceros congener (Konow, 1900): Louangnamtha prov., Namtha: Muang Sing, 21°09'N, 101°19'E, 05-31. 05. 1997, 1 male; Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,30. 05. 2011, 1 female; 10. 05. 2011, 1 male; 08. 06. 2009, 1 male; Boli Kham Xai prov., Ban Nape 8km NE, 18°21'N, 105°08'E, 600 m, 01-18. 05. 2001, 1 male; Bolikhamsai prov., Ban Nape env., 350 m, 18°20'N, 105°08'E, 07-16. 05. 2004, 1 female; Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,06. 05. 2011, 1 male; Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°15'N, 104°02'E, 1500-2000 m,26.04.-11. 05. 2001, 1 female; Boikhamsai prov., Pakkading, 18°19'N, 103°59'E, Novembre 2000, 1 female; Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,02-03. 05. 2011, 1 female; Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,11. 05. 2011, 1 female.

Neostromboceros chalybeus (Konow, 1908): Louang Phrabang prov., Ban Song Cha env., 1200 m, May 1999, 1 female.

Neostromboceros punctatus (Konow, 1908): Louangnamtha prov., Namtha: Muang Sing, 21°09'N, 101°19'E, 05-31. 05. 1997, 1 male; Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,28. 05. 2011, 1 male.

Neostromboceros nigrogiganteus Haris, 2006: Hua Phan Prov., Phou Pan Mt., 20°12'N, 103°59'E, 1350-1900 m,10-22. 05. 2011, 1 female; Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,18. 05. 2011, 1 female; Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,28. 05. 2011, 1 female; Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,27. 05. 2011, 1 female.

Neostromboceros rugifrons Malaise, 1944: Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,15. 05. 2011, 1 female.

Neostromboceros caeruleiceps (Cameron, 1899): Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,12. 05. 2010, 1 male; 24-25. 05. 2010, 1 female; 06. 06. 2009, 1 male; 16. 05. 2011, 1 male; 03-05. 06. 2009, 1 male.

Neostromboceros nigrocollis Wei, 1998: Phongsaly prov., Phongsaly, 21°41'N, 102°06'E, 1500 m, 06-17. 05. 2004, 1 female; Louang Phrabang prov., Ban Song Cha env., 1200 m, May 1999, 2 females; Louangnamtha prov., Namtha: Muang Sing, 21°09'N, 101°19'E, 05-31. 05. 1997, 1 male.

Neostromboceros fuscitarsis Takeuchi, 1929: Louang Phrabang prov., Ban Song Cha env., 1200 m, May 1999, 1 female; Louangnamtha prov., Namtha: Muang Sing, 21°09'N, 101°19'E, 05-31. 05. 1997, 2 males; Phongsaly prov., Phongsaly, 21°41-42'N, 102°06-08'E, 1500 m, 28. 05. – 20. 06. 2003, 1 female.

Neostromboceros indobirmanus Malaise, 1944: Louang Phrabang prov., Ban Song Cha env., 1200 m, May 1999, 1 female.

Iconia versicolor Malaise, 1944: Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,27. 05. 2011, 1 female; Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,10. 05. 2011, 1 female.

Denticornia ruficornis (Rohwer, 1915): Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,04. 05. 2011, 1 female.

Denticornia siamana Togashi, 1988: Phongsaly prov., Phongsaly, 21°41'N, 102°06'E, 1500 m, 06-17. 05. 2004, 1 male.

Edenticornia formosana (Malaise, 1944): Louangnamtha prov., Namtha: Muang Sing, 21°09'N, 101°19'E, 05-31. 05. 1997, 1 female.

Neothrinax corvina Malaise, 1944: Louangphrabang, Thong Khan, 19°35'N, 101°58'E, 11-21. 05. 2002, 1 male.

Heptamelus kalamunitopensis M.S. Saini & T.P. Saini, 1997: Phongsaly prov., Phongsaly, 21°41-42'N, 102°06-08'E, 1500 m, May-June 2003, 2 males.

Nesoselandria birmana Malaise, 1944: Bolikhamxai prov., Pakkading, 18°20'N, 104°00'E, 300 m, 27. 05. 2003, 1 female; Phongsaly prov., Phongsaly, 21°41'N, 102°06'E, 1500 m, 06-17. 05. 2004, 1 male; Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°15'N, 104°02'E, 1500-2000 m,06-18. 05. 2004, 1 female; Louangphrabang, Thong Khan, 750 m, 19°35'N, 101°58'E, 11-21. 05. 2002, 1 female.

Nesoselandria ruga M.S. Saini & Vasu, 1999: Khammouan prov., Ban Khoun Ngeun, 250 m, 18°07'N, 104°29'E, 20-29. 05. 2004, 3 females.

Nesoselandria annandalei (Rohwer, 1915): Louang Phrabang prov., Ban Song Cha env., 1200 m, May 1999, 1 female.

Nesoselandria shanica Malaise, 1944: Khammouan prov., Ban Khoun Ngeun, 250 m, 18°07'N, 104°29'E,, 20-29. 05. 2004, 1 male.

Nesoselandria devriesiana Haris, 2006: Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,10. 05. 2011, 1 female.

Nesoselandria annamitica (Forsius, 1931): Bolikhamsai prov., Ban Nape env., 350 m, 18°20'N, 105°08'E, 07-16. 05. 2004, 1 female; Bolikhamsai prov., Ban Nape env., 350 m, 18°20'N, 105°08'E, 01-08. 05. 2004, 1 female.

Nesoselandria indica M.S. Saini, T.P. Saini & Vasu, 2001: Khammouan prov., Ban Khoun Ngeun, 250 m, 18°07'N, 104°29'E, 20-29. 05. 2004, 1 female; Bolikhamsai prov., Ban Nape env., 350 m, 18°20'N, 105°08'E, 07-16. 05. 2004, 1 female.

Description of the new species

Apethymus turrisii spec. nov. (Figs. 1, 11, 16 and 25)

Holotype: female: Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,15. 05. 2011. Paratypes: female, Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,02-03. 05. 2011; female, Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,21. 05. 2011; female, Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m,10. 05. 2011.

Head black; white: labrum and clypeus entirely, most of mandibles except brown apex, small supraclypeal triangle above clypeus between base of antennae and palpi. Antenna black, segments 7-9 white. Thorax black; white: pronotum, propleuron, tegula, parapterum, metascutellum, mesoscutellum entirely, anterior margines of mesonotal middle lobes. Legs white (including all coxae, trochanters and tarsi); black: all femora (except narrow white apex and base of first and middle femora), apical third of fore and middle tibiae and apical 40% of hind tibia. Wings gently subinfumated. Costa, subcosta, stigma and venation brownish black. Basal third of costa and base of stigma white. Abdomen black; pale yellow: hind margin of first tergite (propodeum), second tergite (except large middle black spot), ventro-lateral spots of tergites (expcept last 2 tergites), all sternites (except last sternite which has only yellow middle line), large middle spot on tergite 9 and apical triangle on last tergite (tergite 10). Vertex and temples finely, minutely and densely punctured, shiny. Frontal area densely and roughly punctured, hardly shiny. Pentagonal frontal area elevated. Postocellar furrow reaching hypothetic hind margine of head. Clypeus deeply and roundly emarginated. Depth of clypeal emargination: middle length of clypeus: 3:7. Ratios of antennal segments: 16:9:45:48: 41:30:26:22:25. Head gently dilated than contracted behind eyes, more or less subparallel. Gena as long as diameter of anterior ocellus. Postoccipital carina reaching up to the upper corner of eye. Mesonotum, mesoscutellum and mesoscutellar appendage densely and moderately deeply punctured, moderately shiny. Interspaces about 2/3x as large as diameter of a puncture. Metascutellum moderately densely and deeply punctured. Interspaces about as large as a diameter of a puncture. Mesopleuron very densely roughly and deeply punctured, hardly shiny. Mesosternum moderately densely punctured with deep and small punctures, shiny. Interspaces about 1-3x as large as diameter of a puncture. Mesoscutellum flat. Abdominal tergites (including propodeum) with fine and dense surface sculpture, moderately shiny. Length of ovipositor: length of hind tibia: 53: 80. Length of inner hind tibial spur: length of hind basitarsus: 11:40. Claws without basal lobe, inner tooth longer and wider than apical (Fig. 16). 14.7 mm. (paratypes: 13.9-16.5 mm).

Individual variation: paratypes has no white line on anterior margin of mesonotal lateral lobe.

The new species is dedicated to Dr. Fabricio Turrisi.

The related species:
Apethymus kolthoffi (Forsius, 1927): It's clypeus is black, first and middle tibiae are brown, 10:0-11.5 mm (KOCH 1988). The new species has white clypeus, all tibiae are white with black apex. 14-16.5 mm. Serrulae are also completely different, compare Fig. 1 with Fig. 6.3 in KOCH 1988.

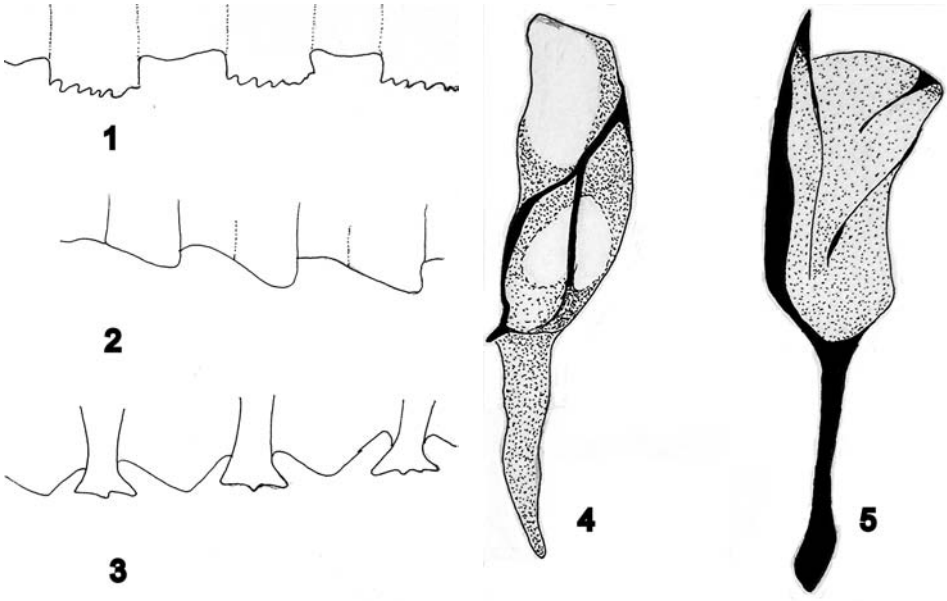

Fig. 1: 3-5 serrulae of *Apethymus turrisii* spec. nov.; Fig. 2: 3-5 serrulae of *Taxonus rubroscapus* spec. nov.; Fig. 3: 4-6 serrulae of *Taxonus laoensis* spec. nov.; Fig. 4: Penis valve of *Caliroa laonigrissima* spec. nov.; Fig. 5: Penis valve of *Caliroa laominuta* spec. nov.;

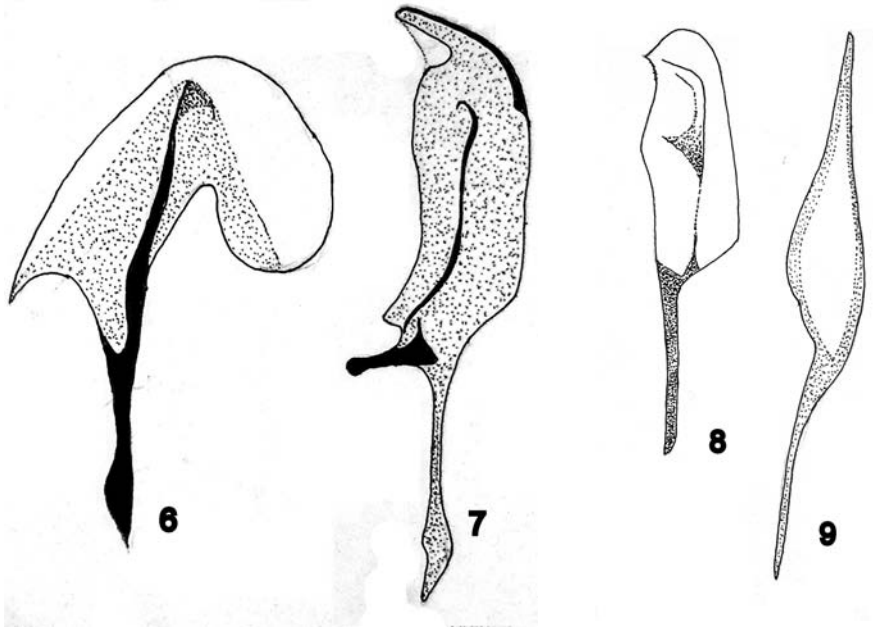

Fig. 6: Penis valve of *Neostromboceros kubani* spec. nov.; Fig. 7: Penis valve of *Taxonus sanctifloriani* spec. nov.; Fig. 8: Penis valve of *Emphystegia pseudomaculata* spec. nov.; Fig. 9: Penis valve of *Taxonus albotemplis* spec. nov.

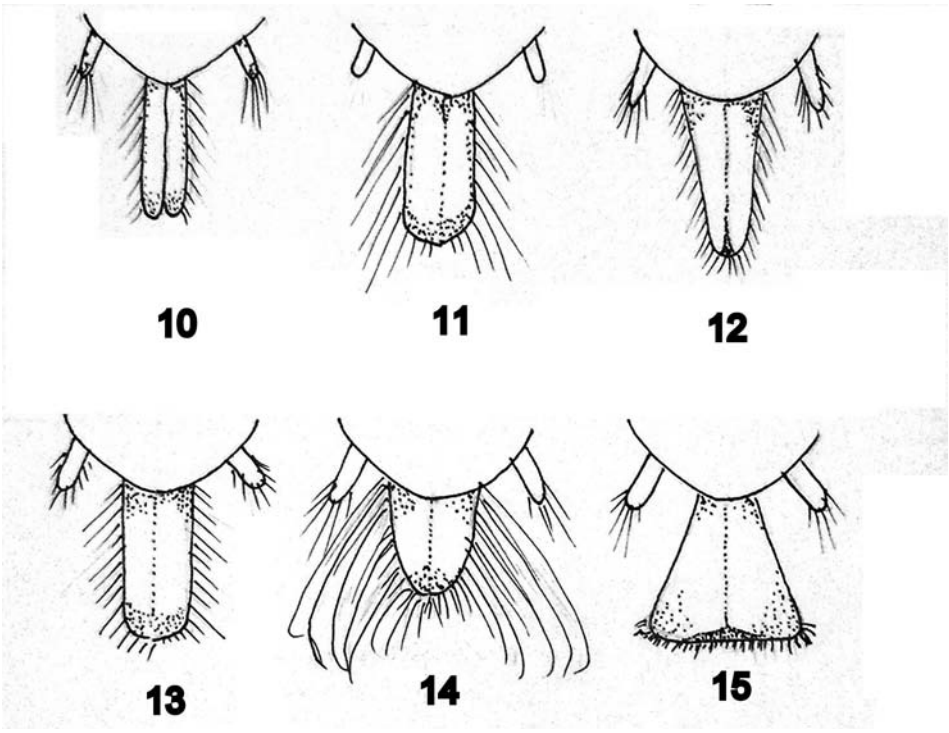

Fig. 10: Sawsheath of *Heptamelus kubani* spec. nov.; Fig. 11: Sawshetah of *Apethymus turrisii* spec. nov.; Fig. 12: Sawsheath of *Taxonus rubroscapus* spec. nov.; Fig. 13: Sawsheath of *Taxonus laoensis* spec. nov.; Fig. 14: Sawsheath of *Beleses gusenleitneri* spec. nov.; Fig. 15: Sawsheath of *Taxonus sanctifloriani* spec. nov.

Apethymus compressicornis Zhu & Wei, 2008: Tibiae are without white, mesoscutellum and metascutellum black. 13.0 mm (ZHU and WEI 2008). The new species has basal 2/3 of all tibiae, mesoscutellum and metascutellum are white. 14-16.5 mm.

Apethymus pleuritanus Wei, 1999: It's mesoscutellum is black and mesopleuron is impunctate and shiny, 9.0 mm (WEI and ZHU 1999). The mesoscutellum of the new species is white, mesopleuron is densely and roughly punctured, matt. The new species is significantly larger: 14-16.5 mm.

Beleses gusenleitneri spec. nov. (Figs. 14, 21 and 26)

Holotype: female, Laos, Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 06. 05. 2011, leg. C. Holzschuh and locals.

Body, including legs and mouthparts brownish orange; black: 2-4 antennal segments. Wings infuscate, subcosta, veins black, costa and stigma yellow transparent. Upper margin of stigma infuscate. Frontal area and area between eyes roughly, deeply and densely punctured with large punctures, hardly shiny. Temples and vertex densely punctured with shallow, moderately large punctures, shiny. Antenna about as long as head, thorax

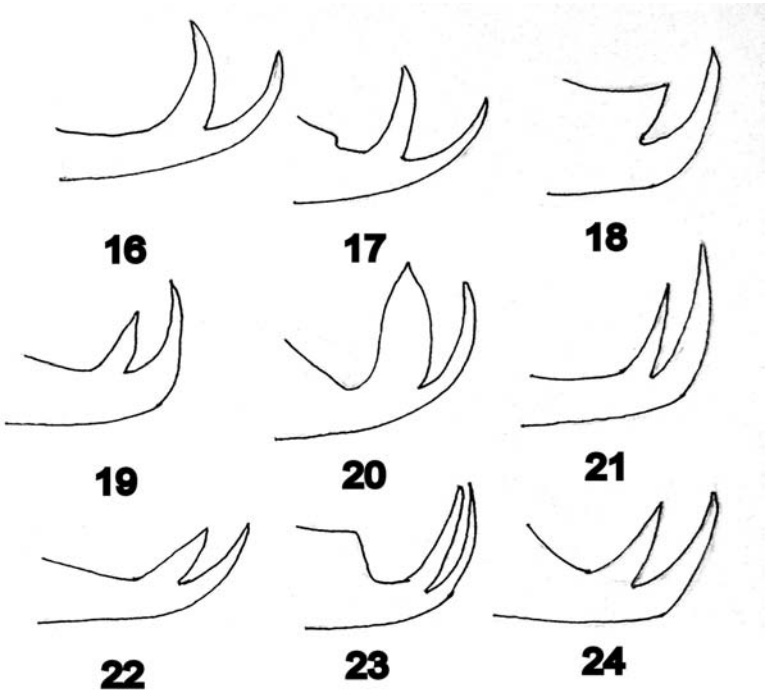

Fig. 16: Claw of Apethymus turrisii spec. nov.; Fig. 17: Claw of Heptamelus kubani spec. nov.; Fig. 18: Claw of Caliroa laonigrissima spec. nov.; Fig. 19: Claw of Neothrinax phoupanensis spec. nov.; Fig. 20: Claw of Taxonus rubroscapus spec. nov.o; Fig. 21: Claw of Beleses gusenleitneri spec. nov.; Fig. 22: Claw of Ridgea laoensis spec. nov.; Fig. 23: Claw of Neostromboceros kubani spec. nov.; Fig. 24: Claw of Taxonus laoensis spec. nov.

and first 2 abdominal segments combined. Ratios of antennal segments: 11 : 11 : 30 : 28 : 27 : 21 : 21 : 16 : 20. OOL : POL : OCL: 9: 10 : 10. Length : width of postocellar area: 1.0 : 2.0. Postoccipital carina non visible. Frontal area slightly elevated. Clypeus truncate. Gena narrow, about 0.4x as wide as diameter of anterior ocellus. Head contracted behind eyes. Mesonotal lobes shiny with moderately sparse, small punctures. Mesoscutellum, mesoscutellar appendage and metascutellum smooth and shiny. Hind wing with 1 closed middle cell. Anal cell of hind wing with short petiole, nervellus runs into petiole just behind apex of anal cell. Prepectus present. Mesopleuron nearly smooth and shiny with sporadic small, shallow punctures. Abdominal tergites shiny, with undefined surface sculpture. Hind basitarsus narrow, elongated. Length of inner hind tibial spur: length of hind basitarsus: 5 : 14. Claw with slender subapical toooth, little shorter than apical without basal lobe. Length: 10.3 mm.

The new species is dedicated to Dr. Fritz Gusenleitner.

According to the generic interpretation of MALAISE (1963), the new species belongs to genus *Eusunoxa* Enslin, 1911, since claws without basal lobe. In this case, the new species is related to *Eusunoxa major* (Wei, 2003). This species has hind basitarsus flat and

dilated like all other typical species of this genus. The hind basitarsus of the new species is normal and cylindrical.

In the keys of SAINI (2006a) and SMITH and SAINI (2003) the new species is a *Beleses* Cameron, 1877, because the hind basitarsus normal. In this case, the new species related to *Beleses unicolor* Wei, 1999 and *Beleses satonis* (Takeuchi, 1929) these species has antenna fulvous or fulvous and white. The antenna of the new species has fulvous-black-fulvous. Also, these 2 species have claws with basal lobe, the claw of the new species is without basal lobe which is not usual in genus Beleses Cameron.

Caliroa laoparvula spec. nov. (Fig. 28)

Holotype: female, Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 10-19. 05. 2009, leg. C. Holzschuh and locals.

Head, antenna, thorax and abdomen black including palpi and mouthparts. Legs black; white: anterior and middle knees, basal fifth of hind tibia, basal half of hind basitarsus. Wings hyaline, costa black, stigma, subcosta and venation brown. Ratios of antennal segments 1-9: 9 : 11 : 25 : 15 : 13 : 9 : 7 : 6 : 8. Antenna about as long as head and mesonotal lobes combined. Clypeus subtriangularly emarginated, clypeal emargination about 0.33x as deep as clypeal median length. Temples and vertex smooth and shiny. Frontal area with fine and small, moderately dense punctures, shiny. Supraantennal pits, large, about 1.2x larger than front ocellus. Frontal area without ridges, gently elevated. Head contracted behind eyes and temples behind eyes about half as wide as length of scape. Gena linear. Postoccipital carina present but very short, restricted to lover 15 percent of hind orbit. Mesonotal lobes, mesoscutellum, mesoscutellar appendage, metascutellum and mesopleuron smooth and shiny. Hind wing with 2 closed middle cell, anal cell of hind wing with petiole. Length of hind tibial spur : width of hind tibia: 2 : 3. Claw with large basal tooth and without subapical tooth (similar to Fig. 18). Length: 5.0 mm.

In WEI 1997b, the new species runs to *Caliroa parvula* Wei, 1997. The differences, in *Caliroa parvula* Wei, middle cells are missing, four anterior tibiae are white and basal half of hind tibia is white. The new species has 2 middle cells in hind wing, four anterior tibiae are dominantly black, as it is described above and only a basal ring is white on hind tibia.

Caliroa laonigrissima spec. nov. (Figs. 4, 18 and 27)

Holotype: male, Lao, Phongsaly prov., Phongsaly env., 21°41'N, 102°06'E, 1500 m, June 2003, leg.: Pacholatko.

Male. Head, thorax, abdomen including antennae, palpi, mouthparts and legs entirely black withouth any white or whitish spot and without any bluish tinge. Wings dark infuscate. Costa, subcosta, stigma and venation brownish-black. Tegulae grayish-brown. Frontal area, vertex, temples densely and shallowly punctured, shiny. Antenna short, about as long as head and prescutum combined. Ratio of antennal segments 1-9: 9 : 7 : 22 : 12 : 10 : 9 : 7 : 6 : 6. Temples subparallel behind eyes and about as wide as length of 5th antennal segment. Gena linear, clypeus truncate. Pentagonal frontal area marked by blunt ridges. Mesonotum, mesoscutellum, mesoscutellar appendage and metascutellum sparsely, minutely punctured, shiny. Mesopleuron smooth and shiny. Abdominal

Fig. 25: ***Apethymus turrisii*** **spec. nov. paratype**

Fig. 26: ***Beleses gusenleitneri*** **spec. nov. holotype**

Fig. 27: ***Caliroa laonigrissima*** **spec. nov. holotype**

Fig. 28: ***Caliroa laoparvula*** **spec. nov. holotype**

tergites 1-3 smooth and shiny. Other tergites with undefined shallow surface sculpture, shiny. Hind wing without closed middle cell and without marginal vein. Inner hind tibial spur as long as apical width of hind tibia. Claws with large basal lobe without subapical tooth (Fig. 18). Penis valve in Fig. 4. Length: 6.9 mm.

In WEI 1997b, this species runs to *Caliroa cerasi* (Linné, 1758). The penis valve clearly differentiates the new species from *Caliroa cerasi* L. (compare Fig. 2 in WEI, 1997b and Fig. 4). Wings of *Caliroa cerasi* L. hyaline, the new species has wings infumate.

Caliroa laominuta spec. nov. (Fig. 5)

Holotype: male, Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 22. 04. 2010, leg. C. Holzschuh and locals, paratype, female, topotypic but 01. 05. 2010.

Head (including mouthparts and palpi), antenna, thorax and abdomen black. Cemchri greyish brown. Legs black, apices of all femora, basal fifth of all tibiae, ventral surface of anterior tibia, basal 4 segments of anterior tarsus, basal 2 segments of middle tarsus white. Wings hyaline, costa, subcosta, stigma and venation brownish black. Ratios of antennal segments 1-9: 4 : 6 : 18 : 13 : 9 : 6 : 5 : 4 : 5. Temples, vertex and frontal area shiny with small and shallow moderately dense punctures. Temples contracted behind eyes and about as wide as length of last antennal segment. Outer orbite matt and roughly punctured with deep punctures. Gena linear. Clypeus roundly emarginated, clypeal emargination about 0.4x as deep as clypeal median length. Frontal area marked with blunt ridges. Supraantennal pits deep and large, about as large as front ocellus. Mesonotal lobes and mesoscutellum with sporadic small punctures, shiny. Mesoscutellar appendage smooth and shiny. Metascutellum with few punctures, shiny. Mesopleuron smooth and shiny. Inner hind tibial spur shorter than width of hind tibia as 2: 3. Hind wing without closed middle cells and without marginal vein. Claw similar to Fig. 18. Penis valve in Fig. 5. Length: 4.3 mm.

In WEI 1997b, the new species would run to *Caliroa parvula* Wei, 1997. The differences: in *Caliroa parvula* Wei, 1997, anal cell of hind wing is petiolate, basal half of hind tibia and four anterior tibia are white. In the new species, anal cell of hind wing is sessile, basal quarter of hind tibia is white and middle tibia dominantly (in 3/4) is black. *Caliroa parvula* Wei, 1997 is smaller, only 3.4 mm.

Denticornia laoensis spec. nov. (Fig. 29)

Holotype: male, Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 07. 05. 2011.

Head, antennae, palpi, mouthparts and thorax black with slight bluish lustre, only tegulae white (except black margin). Legs black; yellow: basal 2 segments of hind basitrsus; white: basal 2/3 of hind tibia, ventral surface of anterior tibia, central spot of ventral surface of middle tibia, ventral apex of anterior tibia. Wings hyaline, apical part from base of costa slightly brown infumate; costa, subcosta, stigma and venation dark brown. Abdomen black, tergites 3 and 4 entirely, triangular spot on tergite and base of tergite 4, sternites 3-4 and partly sternite 5 yellowish white. Apices of antennal segments

2-8 with projecting tufts of black hair. Ratios of antennal segments: 9 : 5 : 19 : 20 : 15 : 13 : 12 : 9 : 10. Antenna as long as head and thorax combined without propodeum. Pentagonal frontal area sunken bordered by blunt ridges, clypeal emargination about 0.25x as deep as clypeal median length. Gena linear. Middle and lateral pits about as large as front ocellus. Mesonotum and mesoscutellum with shallow, sporadic punctures, shiny. Hind margin of middle mesonotal lobe with deep and moderately dense punctures. Mesoscutellar appendage with few, moderately small and deep punctures. Length of inner hind tibial spur: length of hind basitarsus: 9:31. Length: 7.9 mm.

The closest relative is *Denticornia sikkimensis* (Malaise, 1934) having slight metallic lustre and all legs extensively white. However, the wide white band on the abdomen (tergite 3 and 4 entirely white) differs the new species from all other relatives. During genitalia dissection, the specimen fallen into part and badly destroyed.

Emphystegia pseudomaculata spec. nov. (Fig. 8)

Holotype: male, Laos, Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 13. 05. 2011, leg. C. Holzschuh and locals.

Head black; white: clypeus, labrum, mandibles (except brown apex). Antenna entirely black. Thorax black; hind corner of pronotum, parapteron, denchri and small middle spot in middle of mesoscutellum and that of metascutellum white; tegula brown. Coxae and trochanters white, anterior coxa with small basal, other coxae with large basal black spot. Anterior and middle femora, all tibiae fulvous. Hind femur black, basal 2/3 of hind tibia fulvous, apical third black. Wings hyaline, stigma, costa dark brown, subcosta, venation blackish brown. Abdomen black, sternite 5 with wide basal spot. Ratios of antennal segments: 12 : 5 : 22 : 30 : 30 : 24 : 20 : 15 : 19. OOL : POL : OCL: 11 : 5 : 15. Head smooth and shiny, contracted behind eyes. Antenna about as long as head, thorax and half abdomen combined. Antenna filiform. Postoccipital carina reach to half level of eye. Clypeus broadly and slightly emarginated. Clypeal emargination about 0.2x as deep as clypeal median length. Gena about 0.4x as wide as diameter of anterior ocellus. Postocellar furrow deep reaching hypothetic hind margin of head. Thorax smooth and shiny. Wings with 4 cubital cells. Hind wing without closed middle cells. Anal cell of anterior wing with oblique cross-vein. Hind wing without marginal wein. Anal cell of hind wing sessile. Inner hind tibial spur short, length of inner hind tibial spur : hind basitarsus: 10 : 41. Claws with inner tooth, shorter than apical, without basal lobe. Length: 7.6 mm.

Closest relative: *Isotaxonus maculatus* M.S. Saini & Vasu, 2001. Differences: the internal triangular sclerotised part of penis valve is in bottom position in *Isotaxonus maculatus* M.S. Saini & Vasu, 2001, but it is in central position in the new species. The stem is connected to ventral margin of penis valve in straight line in the new species but this point is deeply concave *Isotaxonus maculatus*. (Compare Fig. 8 and Fig. 7 in SAINI and VASU 2001). Male of *Isotaxonus maculatus* has hind femur fulvous and tergites 2-3 dominantly, tergites 4-5 entirely fulvous. In the new species, all these parts are black. In *Isotaxonus maculatus* metascutellum black, in the new species with central white spot.

Heptamelus kubani spec. nov. (Figs. 10, 17 and 30)

Holotype: female. Laos N., 1200 m., Louang Phrabang prov., Ban Song Cha env., May 1999, Leg. V. Kuban.

Fig. 29: ***Denticornia laoensis*** **spec. nov. holotype**

Fig. 30: ***Heptamelus kubani*** **spec. nov. holotype**

Fig. 31: ***Neostromboceros kubani*** **spec. nov. holotype**

Fig. 32: ***Neothrinax phoupanensis*** **spec. nov. holotype**

Head and thorax black, tegulae pale brownish-white. Abdomen black, hind margine of tergite 1, total abdominal segments 2-5 light brownish-yellow. Abdominal sternites and basal part of ovipositor brownish-yellow except black last 2 sternites and valvula 3. All legs entirely brownish-yellow. Antenna black, scape and pedicel brownish-yellow. Wings subhyaline, costa, subcosta, stigma and veins brownish-black. Frontal area, vertex and temples shiny with moderately deep and moderately dense punctures, shiny interspaces about 2-3x as large as a diameter of a puncture. Frontal area not marked with sutures or ridges neither elevated or sunken. Lateral supraantennal pits longitudinally elongated and narrow, suture like. Middle supraantennal pit oval, longitudinally elongated. Clypeus roundly emarginated, clypeal emargination about 0.25x as deep as clypeal median length. Gena short, about 0.3x as long as diameter of median ocellus. Ratios of antennal segments: 12 : 11 : 27 : 17 : 15 : 13 : 18. OOL:POL:OCL: 14:9:14. Head without postoccipital carina. Postocellar furrows reaching hypotethic hind margin of head. Head contracted behind eyes. Mesopleuron shiny, upper half of mesopleuron with deep, large punctures, shining interspaces about as large as 0.1-0.5x of diameter of one puncture. Mesonotal lobes and mesoscutellum shiny with moderately small and moderately deep punctures. Mesoscutellar appendage and postscutellum smooth and shiny. Mesoscutellum flat. Abdominal tergites 1 and 2 smooth and shiny. Other tergites with fine coriaceous surface sculpture, shiny. Claws with basal lobe (Fig. 17). Internal tooth of claw longer and thicker than apical. Length of ovipositor: length of hind tibia: 81 : 88. Sawsheath in Fig. 10. Length: 6.65 mm.

The new species is dedicated to Mr. Vit Kuban.

The new species is related to *Heptamelus mangshanicus* Wei, 2002. *Heptamelus mangshanicus* Wei, 2002 has tergites 2-6 yellowish brown with black maculae (WEI and XIAO 2002). The new species has tergites 2 -5 entirely brownish yellow without any black maculae. It is also related to *Heptamelus verticinus* Wei, 1997. However, *H. verticinus* Wei, 1997 has abdomial tergites with black maculae and central area of mesonotum is reddish-brown (WEI and NIE 1997). The new species has no black maculae on tergites and mesonotum is entirely black. *Heptamelus yunnanensis* Wei, 1997 is also related to the new species. But, *H. yunnanensis* Wei, 1997 is larger, 8.2 mm., tergites 2 and 5 with black central part and pedicel is black (WEI and NIE 1997). The new species is smaller and these parts are brownish-yellow.

Neostromboceros kubani spec. nov. (Figs. 6, 23 and 31)

Holotype: male, Louangnamtha prov., Namtha: Muang Sing, 21°09'N, 101°19'E, 05-31. 05. 1997, leg. Vit Kubán.

Head and antenna black, only labrum white. Thorax black, tegula rusty brown, cenchri white. Legs black, base of all tibiae with small white spot. Abdomen black, propodeum and first abdominal segment entirely white (sternites and tergites). Wings hyaline. Subcosta and venation blackish brown. Costa light brown, stigma white with black apex. Postoccipital carina short reaching up to 1/3 of the height of eye. Ratios of antennal segments 1-9: 11 : 8 : 30 : 25 : 18 : 11 : 10 : 8 : 11. Antenna about as long as head and thorax combined without propodeum. Head contracted behind eyes, temple behind eye as wide as half of third antennal segment. Vertex and temples smooth and shiny. Frontal area moderately densely punctured with small and shallow punctures, shiny. Supraantennal tubercles large and double. Pentagonal frontal area elevated without ridges. Clypeus

gently emarginated with middle blunt wide tooth. Gena linear. Mesonotal lobes with small, shallow punctures, shiny. Mesoscutellum with raw of punctures behind otherwise smooth and shiny. Mesosscutellar appendage and metascutellum smooth and shiny. Mesopleuron with moderately dense, small punctures, shiny. Abdomen without sinus sexualis. Second tergite compressed. First 3 abdominal tergites smooth and shiny, others with fine surface sculpture. Apical and subapical teeth of claws subequal in length, subapical tooth wider, claws with basal lobe (Fig. 23). Length of inner hind tibial spur: apical width of hind tibia: 7 : 5. Penis valve in Fig. 6. Length: 8.3 mm.

The new species is dedicated to Mr. Vit Kuban.

In shape of penis valve, the new species related to *Neostromboceros macropunctatus* Vasu & M.S. Saini, 1999. *N. macropunctatus* Vasu and Saini is entirely black, without white ring in middle of abdomen and the apex of penis valve acute in the new species (blunt in *N. macropunctatus*) the plate of penis valve significatntly larger than stem in proportion in the new species (while the proportion of plate and stem is opposite in *N. macropunctatus*). Also internal structure of penis valve is different in the 2 closely related species.

Neothrinax phoupanensis spec. nov. (Figs. 19 and 32)

Holotype: female, Prov. Hua Phan, Phou Pan Mt., Umg. Ort Ban Saleui, 20°13'30"N, 103°59'26"E, 1350-1900 m, 28. 05. 2011, leg. C. Holzschuh and locals, paratype, 1 female, topotypic, but 14-16. 06. 2009.

Head black; clypeus, labrum, palpi and base of mandibles white. Antenna black, scape with longitudinal white spot. Thorax and abdomen black, hind margin of pronotum, tegula, horizontal band on mesopleuron white. Abdominal tergites 4-8 with narrow yellow hind margin, last tergite yellow. Tegulae whitish brown. Apical 4 tarsal joints of middle leg, all tarsal joints of hind legs brown, legs otherwise entirely white. Wings hyaline, costa, subcosta, stigma and venation black. Ratios of antennal segments: 11 : 9 : 32 : 25 : 16 : 11 : 10 : 10 : 9. Antenna as long as head and half of thorax till apex of mesoscutellum. Postoccipital carina reaching up to the upper edge of eye. Clypeal emargination wide and abour 04x as deep as clypeal median length. Gena short, 0.25x as long as diameter of anterior ocellus. Frontal area elongated, laterally marked with ridges. Supraantennal pits large, basin-like covering total area from frontal area till inner margin of eyes. Temples contracted behind eyes and about as wide as length of 5th antennal segment. Head smooth and shiny. Outer halves of mesonotal lobes with shallow, sporadic punctures, shiny, inner halves and mesoscutellum smooth and shiny. Mesoscutellar appendage smooth and shiny in middle, hind corners with large and deep punctures. Metascutellum with dense surface sculpture, matt. Mesopleuron smooth and shiny. Basal 3 abdominal tergites smooth and shiny others with fine surface sculpture, shiny. Claws with subapical tooth little shorter than apical (Fig. 19). Length of inner hind tibial spur: length of hind basitarsis: 6 : 16. Length: 7.2 mm.

It's closest relative is *Neothrinax corvina* Malaise, 1944. *Neothrinax corvina* Malaise has dominantly black femora, black coxae and trochanters, basal sternites, base of scutellum and spots on extreme lateral corners of prescutum are white, 4 anterior tibiae with black strip. The new species has thorax entirely black, coxae, trochanters and femora white and tibiae white without black strip.

Fig. 33: ***Ridgea laoensis*** **spec. nov. holotype**

Fig. 34: ***Taxonus laoensis*** **spec. nov. holotype**

Fig. 35: T*axonus rubroscapus* spec. nov. holotype

Fig. 36: *Taxonus albotemplis* spec. nov. holotype

It is also similar to *Neothrinax achterbergi* Haris, 2008. However, *Neothrinax achterbergi* Haris is much smaller, only 4.0 mm and basal antennal segments are white.

Ridgea laoensis spec. nov. (Figs. 22 and 33)

Holotype: female, Phongsaly prov., Phongsaly, 21°41-42'N, 102°06-08'E, 1500 m, May-June 2003, leg. Kubán.

Body black; white: prepectus, tegula, scape, pedicel, basal spot on 3rd antennal segment, abdominal sternites 1-6 and cenchri. Legs white, black: apical half of middle and hind tibiae, small apical spot on anterior femora, apical quarter of middle and hind femora, apical segment of tarsi. Wings hyaline, costa, subcosta, veins and stigma brownish black. Ratios of antennal segments 1-9: 9 : 4 : 19 : 19 : 15 : 10 : 9 : 9 : 10. Antenna as long as head, thorax and first 3 abdominal tergites combined. Temples and vertex moderately densely and moderately deeply punctured, hardly shiny. Frontal area very densely punctured, matt. Pentagonal frontal area missing. Eyes connected by a horizontal supraantennal ridge (genus *Ridgea* Saini and Saini 1996). Gena linear. Postoccipital carina short, reaching up to 1/3 of eye. Clypeus shallowly emarginated. Temples behind eyes contracted and about as wide as length of pedicell. Anal cell of fore wing with crossvein. Anal cell of hind wing petiolate. Anterior wing with 2 cubital cells. First cubital crossvein missing. Basalis and first recurrent vein contracted. Hind wing with 2 closed middle cells. Mesonotal lobes with moderately deep and moderately large, sparse punctures, moderately siny. Mesoscutellum with small, moderately deep punctures, moderately shiny. Mesoscutellar appendage and metascutellum smooth and shiny. Mesopleuron smooth and shiny. First abdominal tergite (propodeum) smooth and shiny, others with granulated surface sculpture, hardly shiny. Claws with large subapical tooth without basal lobe, subapical tooth shorter than apical (Fig. 22). Length of inner hind tibial spur: length of hind basitarsus: 15 : 49. Ovipositor very short, apex of ovipositor hardly visible above. Length: 6.6 mm.

The new species related to *Ridgea kalatopensis* M.S. Saini & T.P. Saini, 1996. *Ridgea kalatopensis* has first 2 abdominal tergites and sternites reddish brown, femora are entirely white. The new species has tergites black and sternites 1-6 white. Femora with black spots. Inner tooth of claws are small in *R. kalatopensis* (as it figured in SAINI and SAINI 1996) but large in the new species.

Taxonus laoensis spec. nov. (Figs. 3, 13, 24 and 34)

Holotype: female, Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 14-18. 04. 2010, leg. C. Holzschuh and locals.

Head and antenna black; white: labrum, palpi, middle part of mandible and 4 apical antennal segments. Thorax black; tegula and hind mesonotal margin light brownish white. Cenchri brown. Abdomen black, tergites 3-4 reddish yellow, tergite 3 with 2 large brown spot. Next 3 tergites with reddish basal margin. Sternites 1-5 reddish yellow. Legs reddish yellow, apical 2/3 of hind femora black. Wings hyaline, costa, subcosta, veins and stigma blackish brown, apical half of costa yellowish brown. Ratios of antennal joints 1-9: 11 : 5 : 37 : 27 : 25 : 21 : 18 : 17 : 20. Head subparallel behind eyes, temples behind eyes as wide as length of 8th antennal segment. Head moderately sparsely punctured with moderately large and shallow punctures, shiny. Frontal area moderately

densely with shallow and moderately large punctures, moderately shiny. Frontal area marked with sharp ridges. Clypeus roundly and deeply emarginated. Clypeal emargination as deep as clypeal median length. Antenna about as long as head, thorax (including propodeum) combined. Gena narrow, about half as wide as diameter of anterior ocellus. Postoccipital carina hardly developed, reaching up to half length of eye. Mesonotal lobes moderately sparsely punctured with shallow and moderately large punctures, shiny. Mesoscutellum moderately densely punctured with large, moderately deep punctures, moderately shiny. Mesoscutellar appendage smooth and shiny, metascutellum shiny with few deep and large punctures. Upper 2/3 of mesoscutellum with large, dense and deep punctures, hardly shiny, lower third shiny, with moderately sparse, moderately deep and moderately large punctures. Length of ovipositor : length of hind tibia: 44 : 54. Inner hind tibal spur : maximal apical width of hind tibia: 11 : 9. Subapical tooth of claws about as large as apical, claws without basal lobe (Fig. 24). Serrulae in Fig. 3. Sawsheath in Fig. 13. Length: 10.0 mm.

The 2 related species, namely *Taxonus alboclypea* (Wei, 1997) and *Taxonus albocollinia* Wei, 1998 (Wei and Nie, 1998) can easily be differentiated by genitalia (compare Fig. 1 in WEI and NIE 1998, Fig. 21b in WEI 1997a and Fig. 3). Further differences: *Taxonus albocollinia* Wei central part of mesoscutellum is white, central area of tergites 4-6 are brown, in the new species mesoscutellum without white spot and tergites 3-4 are entirely reddish yellow, apical part of tergite 2 is frequently reddish yellow. In *Taxonus alboclypea* (Wei, 1997) posterior and lateral margines of tergites 2-6 are yellowish brown, scutellum is reddish brown. In the new species, scutellum is black and tergites are as it described above. *Taxonus smerinthus* has complete marginal vein on hind wings even in females, clypeus is white, third antennal is segment shorter than fourth. In the new species, hind wing without marginal vein, third antennal segment is much longer than fourth, clypeus is black. Genitalia (lancets) of the 2 species is also completely different. See also *Taxonus sanctifloriani* spec. nov.

Taxonus rubroscapus spec. nov. (Figs. 2, 12, 20 and 35)

Holotype: female, Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 15. 05. 2011, leg. C. Holzschuh and locals.

Head black; labrum, clypeus, basal half of mandible, palpi and supraclypeal triangle white. Scape, pedicel and base of third antennal segment rusty brown. Antennal segments 3-6 black, 7-9 white. Thorax black, tegula, most of mesoscutellum (except narrow margins) and cenchri white. Coxae, trochanters and 4 apical segments of hind tarsus rusty white. Anterior and middle femora, anterior and middle tibiae and tarsy rusty brown. Hind femur and apical third of hind tibia black. Basal 2/3 of hind tibia and hind basitarsus rusty brown. Abdomen black, 2nd tegite except middle part and hind margines of tergites 3-5 rusty yellow, apical tergite entirely and hind margines of 2 subapical tergites white. Ovipositor entirely black. Wings hyaline. Costa, subcosta, venation blackish brown, apical third of subcosta rusty brown. Stigma black with white basal third. Ratios of antennal joints: 15 : 8 : 40 : 44 : 40 : 30 : 24 : 23 : 25. Antenna about as long as head, thorax and first 3 abdominal segments combined. Last antennal segment apically flattened. Head contracted behind eyes, temple as wide as length of subapical antennal segment. Clypeus deeply and trapesoidally emarginated, clypeal emargination about half as deep as clypeal median length. Clypeus deeply and densely punctured. Gena about 2/3x as wide as diameter of front ocellus. Temples and vertex with moder-

Fig. 37: ***Taxonus sanctifloriani*** **spec. nov. paratype**

ately sparse punctures, shiny. Frontal area laterally marked with blunt ridges, opened above and below. OOL : POL : OCL: 5 : 3 : 5. Mesonotal lobes moderately densely punctured, shiny. Mesoscutellum densely and finely punctured moderately shiny. Mesoscutellar appendage and metascutellum smooth and shiny. Mesoscutellum densely and roughly punctured, matt. Length of inner hind tibial spur : apical width of hind tarsus : 2 : 3. Claws with basal lobe, inner tooth longer and wider than apical (Fig. 20). Serrulae are very special, even in the highest magnification (ocular 10x20 and objective 160/0.17) the microteeths are invisible as seen in Fig. 2. Sawsheath in Fig. 12. Length: 9.9 mm.

There are other 4 species having 3-colors antenna, the most similars are *Taxonus qinlinginus* Wei, 1998 and *Taxonus liui* Wei & Niu, 2009. Differences in genitalia: compare NIU and WEI 2009 Fig. 8, WEI and NIE 1998, Fig. 6 and Fig. 2). Further important difference: in *Taxonus liui* Wei & Niu, and *Taxonus qinlinginus* Wei, the head is dominantly reddish brown, while black in the new species (see Fig. 7 in NIU and WEI 2009).

Taxonus albotemplis spec. nov. (Fig. 9 and 36)

Holotype: male, Laos, Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 13. 05. 2010, leg. C. Holzschuh and locals.

Head white (including mouthparts) black: large spot covering total vertex, anterior half of temples, narrow outer orbits, frontal area down to clypeus and hind part of head behind hipothetical hind margin of vertex. Antenna black; yellowish white: anterior surface of segment 3 and total 4 and 5 segments. Thorax black; white: hind and lateral margin of pronotum, lateral spot on propleuron, parapteron, tegula, apex of mesonotal

anterior lobes, mesoscutellum, mesoscutellar appendage, metascutellum, cenchri and katepimeron. Coxae, trochanters and bases of femora white (except base of hind femora which orange yellow), sides of middle and hind coxae black. Anterior and middle femora orange-yellow with white base. Hind femur black with orange yellow base and orange yellow longitudinal, anterior strip. All tibiae and tarsi whitish orange-yellow. Wings subhyaline, costa brown with white base, stigma dark brown with white basal spot, subcosta and veins blackish brown. Abdomen black, orange yellow: sternites (except last one) basal triangular spot on tergite 2, tergite 3-5 and central part of apical tergites orange yellow. Head densely, moderately deeply punctured with moderately small punctures. Shining interspaces about 1.0-0.5x as large as a puncture, on frontal area punctures more dense. Ratios of antennal segments 1-9: 13 : 9 : 37 : 26 : 25 : 15 : 15 : 15 : 17. OOL : POL : OCL: 16 : 7 : 20. Antenna about as long as head and thorax combined including propodeum. Last 4 antennal segments laterally compressed. Postoccipital carina reaching up to half of eye. Gena about 0.5x as wide as diameter of anterior ocellus. Clypeus very deeply and roundly emarginated. Clypeal emargination about 0.67x as deep as clypeal median length. Oval frontal area gently indicated by blunt ridges. Temples nearly as long behind eyes as 5th antennal segment. Mesonotal lobes, mesoscutellum, mesoscutellar appendage densely, deeply punctured with moderately large punctures. Moderately shiny. Interspaces between punctures about 0.5-0.7x as large as diameter of a puncture. Mesopleuron very densely, roughly punctured with moderately large and deep punctures, slightly shiny. Mesoscutellum flat without ridges or carina. Abdomen elongated, propodeum smooth and shiny with few deep punctures, other tergites shiny, with deep, moderately large, dense punctures. Hind basitarsus nearly as long as following tarsal segments combined. Anterior tibial spur bifurcate. Claw with subapical tooth, little shorter than apical. Basal lobe not visible. Penis valve in Fig. 9. Length: 10.3 mm.

The closest relative is *Taxonus compressicornis* Wei, 1998, having middle antennal segment white. However, *Taxonus compressicornis* Wei, has basal antennal joints red and body is brown with few yellow and black spots. In the new species, basal antennal segments are black, body is black and white only abdominal tergites and legs are coloured with reddish yellow. The special penis valve also differentiates the new species from it's all relatives.

Taxonus sanctifloriani spec. nov. (Figs. 7, 15 and 37)

Holotype: female, Laos, Hua Phan Prov., Ban Saleui, Phou Pan Mt., 20°13'30"N, 103°59'26"E, 1350-1900 m, 04. 05. 2011, leg. C. Holzschuh and locals. Paratypes: female, topotypic, but 04. 05. 2011, female, topotypic but 12. 05. 2011, female, topotypic but 05. 05. 2011, male, topotypic but 06. 05. 2011.

Head black, labrum, anterior 2/3 of clypeus and mandibles reddish brown, palpi brownish white. Antenna black, 3 apical segments white. Thorax black, tegula reddish brown. Legs (including coxae and trochanters) reddish yellow only hind femur black. Wings subhyaline. Costa, subcosta, stigma and veins black. Abdomen and ovipositor black, reddish yellow: basal 4 sternites, tergite 2 (except large brown central spot) and tergite 3 completely. Ratios of antennal segments: 11 : 5 : 40 : 31 : 30 : 25 : 21 : 20 : 20. OOL : POL : OCL: 15 : 6 : 17. Length : width of postocellar area: 17 : 20. Head subparallel behind eyes, large, but very shallow, sporadic punctures, shiny. Postoccipital carina reaching up to half of eye. Head subparallel behind eyes. Frontal area sunken and bor-

dered by blunt carinas. Gena linear. Clypeus roundly and deeply emarginated. Clypeal emargination about 0.5x as deep as clypeal median length. Mesonotal lobes with sporadic, middle sized, shallow punctures, shiny. Mesoscutellum with sporadic deep punctures, shiny. Mesoscutellar appendage and metascutellum smooth and shiny. Upper half of mesopleuron with separated, very large and deep and dense punctures, moderately shiny, lower half smooth and shiny. Mesoscutellum gently elevated, blunt. Abdominal tergites smooth and shiny. Length of hind basitarsus : length of other tarsal joints combined: 10:9. Length of inner hind tibial spur: length of hind basitarsus: 1.0 : 5.0. Basal lobe of claws not visible, subapical tooth little shorter than apical. Sawheath dilated in dorsal view. Length: 9.1 mm (paratypes 8.0-9.0 mm), male: 7.3 mm.

The new species is closely related to *Taxonus smerinthus* Wei, 2003. The differences: *Taxonus smerinthus* has complete marginal vein on hind wings even in females, clypeus and labrum are white, third antennal segment is shorter than fourth. In the new species hind wing without marginal vein, third antennal segment is much longer than fourth, clypeus and labrum are reddish brown not white. Genitalia (penis valve) of the 2 species is also completely different. It is also similar to *Taxonus laoensis* spec. nov. *Taxonus laoensis* has entirely black clypeus (not reddish brown like in the new species) and sawsheath is gently narrowed (not apically expanded like in the new species).

Beleses sapaensis Haris, 2008; *Beleses tianmuensis* Haris, 2008 and *Beleses multipicta* (Rohwer, 1916)

1 (2) Antennal segments 5-9 are white. Tegula and mesoscutellar appendage are pale. Mesopleuron is entirely smooth and shiny with few isolate small and deep punctures. (Hind basitarsus and hind femur are entirely yellow. Sawsheath clearly reaches beyond the last tergite and bluntly rounded in lateral view. Metascutellum is smooth and shiny.). 8.6 mm.....*Beleses multipicta* (Rohwer, 1916)
2 (1) Antennal segments 6-9 are white (in. B. sapaensis also apex of 5th segment is white). Tegula and mesoscutellar appendage are black. Most of mesopleuron is uniformly, moderately densely and deeply punctured, moderately shiny only posterior part of mesopleuron is smooth and shiny.
3 (4) Hind femur is yellow. Basal fifth of hind basitarsus is black. Sasheath is extremely short, apex of sawsheath hardly exceeds the last tergite. (Figure in HARIS 2008). Metascutellum is granulated. 9.5 mm.....*Beleses sapaensis* Haris, 2008
4 (3) Apical fifth of hind femur is black. Hind basitarsus is yellow. Sawheath is very long, paralell, subacute in lateral view and exceed far beyond the last tergite (figure in Haris, 2008). Metascutellum is smooth and shiny. 11.6 mm.
.....*Beleses tianmuensis* Haris, 2008

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Microchelonus deplanus sp. n. from Canada and checklists of the Nearctic and Palaearctic species of the genus *Microchelonus* Szépligeti, 1908 (Hymenoptera, Braconidae: Cheloninae)

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Papp, J.: *Microchelonus deplanus sp. n. from Canada and checklists of the Nearctic and Palaearctic species of the genus Microchelonus Szépligeti, 1908 (Hymenoptera, Braconidae: Cheloninae).*
Abstract: Description of the new species: *Microchelonus deplanus* from Canada (Ontario) comparing it to its nearest species *Microchelonus carinatus* (Provancher). Supplement to the taxonomic distinction of the two Nearctic species: *Microchelonus fulgidus* (McComb) and *M. shenefelti* (McComb) is presented. 113 Nearctic and 488 Palaearctic species of the genus *Microchelonus* are registered in cumulative checklists. The total number of the *Microchelonus* species in the Holarctic region is 601. With 25 line-drawn figures.

Keywords: Microchelonus, new species, Palearctic and Neartic Regions, checklist

Introduction

The first (and so far the last) comprehensive monograph of the Nearctic species of the genus *Microchelonus* Szépligeti, 1908 has been compiled by Ch. W. McComb in 1968. One hundred eleven (111) species are treated in it of which 90 were described as new to science. Since 1968 no new species was reported as well as no further contribution was published concerning the North American *Microchelonus* species. Shenefelt (1973: 873–907) was the first giving generic rank to the taxon *Microchelonus* Szépligeti, 1908.

One new species: *Microchelonus deplanus* is described completed it with the comparison to its nearest ally: *Microchelonus carinatus* (Provancher). The complementary distinction of the two Nearctic species: *M. fulgidus* (McComb) and *M. shenefelti* (McComb) is presented; the two species are very near to each other consequently their specific separation is considerably amplified with new differentation features fitting in an identification key.

To promote the future survey of the Holarctic species of the genus *Microchelonus* the cumulative checklists of the Nearctic and Palaearctic Regions were separately compiled. In the checklists the following taxonomic data are given: original taxon name, describer's name, year of description, (in bracket the original generic name), distribution down to countries (in bracket state, territory, district, area). The synonymous names are inserted in two places: according to the alphabetic affiliation between brackets in the checklist and, on the other, under the valid taxon name after an equals sign (=). A total of 601

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Microchelonus species are registered in the Holarctic Region of which 113 are nearctic and 488 are palaearctic species. As a result of the future exploration these numbers will, presumably, increase significanly, first of all in the Nearctic Region.

Description of the new species

The following abbreviations are applied in the description after van ACHTERBERG (1993: 5 Figs H–K):
Ocelli – OOL = shortest distance between hind ocellus and eye, POL = shortest distance between hind two ocelli.
Fore wing – r = transverse or first section of the radial vein, 1–R1 = first section of the metacarpal vein, 2–SR = first transverse cubital vein, 3–SR = second section of the radial vein.
Surface sculpture is used after HARRIS (1979). Structure terminology is used after GAULD & BOLTON (1988: 58–74).

Microchelonus deplanus sp. n. (Figs 1–10)

Material examined: Male holotype: Canada, Ontario, Mer Bleu, 12 July 1982, leg. L. Huggert. – Holotype is deposited in the Zoological Institute and Museum, Lund, Sweden. Holotype is in good condition: (1) glued on card point by its mesosternum; (2) wings and legs nicely set apart symmetrically.

Etymology: The species name ”deplanus” refers to the strongly dorso-ventrally flattened carapace (cf. Fig. 8).

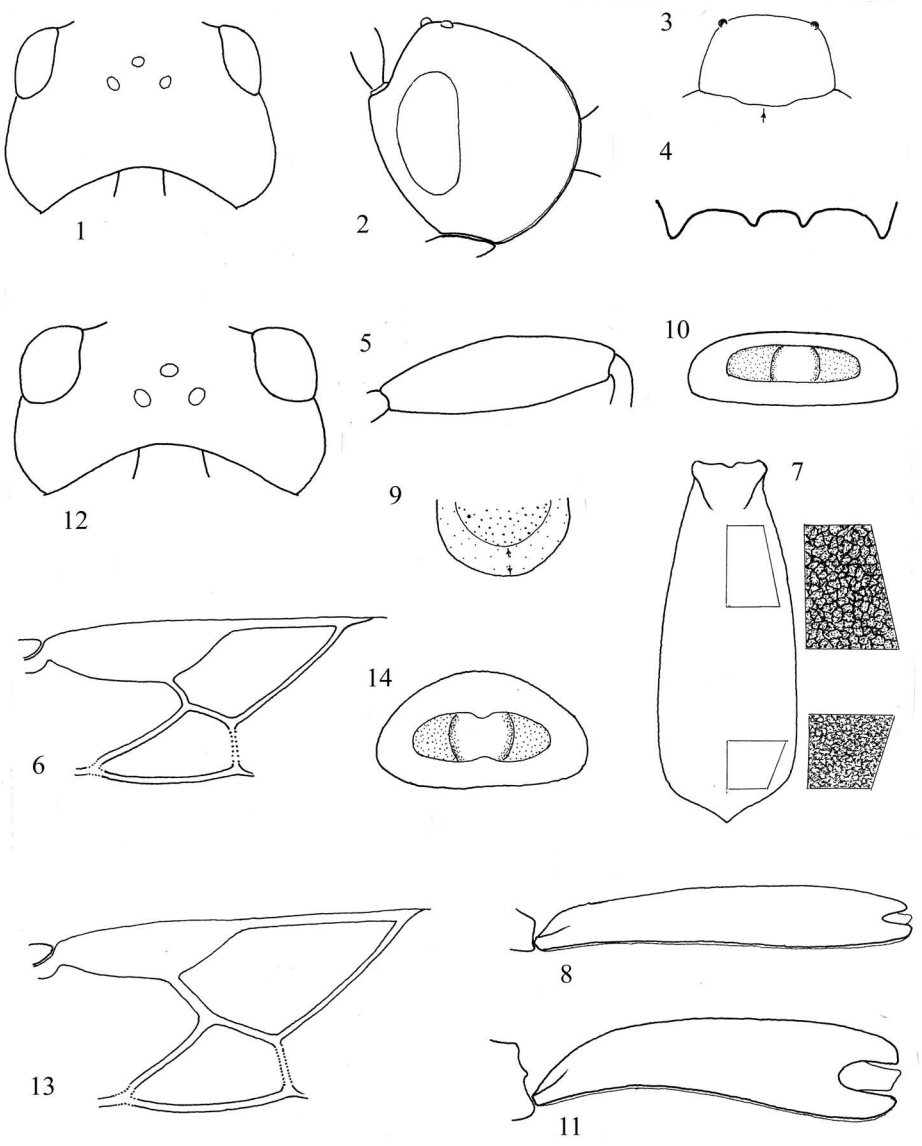
Description of the male holotype: Body 4 mm long. Antenna one-fourth shorter than body (3 mm long), with 22 antennomeres. First flagellomere 3.5 times and penultimate flagellomere 1.6 times as long as broad, flagellum indistinctly attenuating. – Head in dorsal view cubic (Fig. 1), 1.5 times as broad as long, temple clearly swollen and 1.5 times longer than eye; occiput excavated. Ocelli small, OOL one-fourth longer than POL. Eye in lateral view twice as high as wide, temple nearly twice, 1.8 times as wide as eye (Fig. 2). Malar space slightly longer than basal width of mandible. Clypeus 1.5 times as wide below as high medially, its lower margin medially truncate (Fig. 3, see arrow). Clypeus laterally with confluent punctation and subshiny, medially with rather disperse punctation and shiny; head rugulo-subrugose, dull.

Mesosoma in lateral view 1.7 times as long as high. Notaulix and precoxal suture missing. Pronotum less densely rugulose and subshiny, otherwise mesosoma rugulo-subrugose, dull. Propodeal transverse carina with four distinct tubercules (Fig. 4). Hind femur 3.1 times as long as broad medially (Fig. 5). Inner spur of hind tibia shorter than half basitarsus, hind basitarsus as long as tarsomeres 2–4 combined.

Fore wing relatively short, 0.7 times as long as body (55 : 80), Pterostigma three times as long as wide and issuing r clearly distally from its middle; 1–R1 0.6 times as long as pterostigma, r bent, 3–SR 1.6 times longer than r, 2–SR almost straight and 2.7 times longer than 3–SR (Fig. 6).

Carapace in dorsal view 2.6 times as long as broad behind, feebly broadening posteriorly (Fig. 7). Carapace in lateral view strongly flattened dorso-ventrally, 5.7 times as long as high posteriorly (Fig. 8). Carapace apico-ventrally somewhat incurved (Fig. 9). Apical foramen of carapace narrow, 3.7 times as wide as high medially (Fig. 10). Carapace rugo-rugulose, apically densely rugulose (Fig. 7).

Ground colour of body black. Scape and pedicel rusty brown, flagellum black, ventrally with faint brownish tint. Palpi brown to light brown. Pronotum and carapace



Figs 1–14. — Figs 1–10. *Microchelonus deplanus* sp. n. ♂: 1 = head in dorsal view, 2 = head in lateral view, 3 = clypeus, 4 = propodeal carina, 5 = hind femur, 6 = distal part of right fore wing, 7 = carapace in dorsal view with indication of its sculpture, 8 = carapace in lateral view, 9 = apico-ventral end of carapace, 10 = apical foramen of carapace. — Figs 11–14. *Microchelonus carinatus* (Provancher) ♂: 11 = carapace in lateral view, 12 = head in dorsal view, 13 = distal part of right fore wing, 14 = apical foramen of carapace.

anteriorly with faint dark rusty tint. Legs brown, coxae black to blackish. Wings subhyaline, pterostigma and veins light brown.

Female and host unknown.

Distribution: Canada, Ontario.

Taxonomic position: The new species, *Microchelonus deplanus*, is nearest to *M. carinatus* (Provancher) viewing their common features: elongate corporal form, long second submarginal cell of fore wing and black coloured body; the two species are distinct as follows:

1 (2) Carapace in lateral view clearly flattened dorso-ventrally, 5.7 times as long as high posteriorly (Fig. 8). Head in dorsal view cubic, 1.5 times as broad as long, temple clearly swollen and long: 1.5 times longer than eye (Fig. 1). Fore wing: pterostigma wide, three times as long as wide, 2–SR 2.7 times as long as 3–SR (Fig. 6). Antenna with 22 antennomeres. Apical foramen of carapace narrow, 3.7 times as wide as high medially (Fig. 10). ♂: 4 mm. – Canada (Ontario) .....***M. deplanus*** sp. n.

2 (1) Carapace in dorsal view less flattened dorso-ventrally, four times as long as high posteriorly (Fig. 11). Head in dorsal view transverse, 1.9–2 times as broad as long, temple faintly swollen and short: as long as eye (Fig. 12). Fore wing: pterostigma less wide, four times as long as wide, 2–SR 1.7 times as long as 3–SR (Fig. 13). Antenna with 24 antennomeres. Apical foramen of carapace three times as wide as high laterally, medially indented (Fig. 14). ♂: 5–5.2 mm. – Canada (Onterio, ?Quebec).....***M. carinatus*** (Provancher, 1881)

Taxonomic distinction of two known Nearctic *Microchelonus* species

Two *Microchelonus* species: *M. fulgidus* (McComb, 1968) and *M. shenefelti* (McComb, 1968) are very similar to each other hence not clearcut their distinction by the three features given in his key by McComb (1968: 10, couplet 62). Subsequently the two species are separated by features recently recognized.

Microchelonus fulgidus (McComb) (Figs 15–19)

> *Chelonus* (*Microchelonus*) *fulgidus* McComb, 1968: 10 (in key) and 62 (description) ♀, type locality: ”Lyme, Connecticus” (USA), female holotype and two female ?paratypes (from ”Algonquin, Illinois” USA) are deposited in National Museum of Natural History, Washington; type(s) not seen.
>
> *Microchelonus fulgidus* (McComb, 1968): SHENEFELT 1973: 887 (comb. n., literature up to 1968).

Microchelonus shenefelti (McComb) (Figs 20–25)

> *Chelonus* (*Microchelonus*) *shenefelti* McComb, 1968: 10 (in key) and 116 (description) ♀♂, type locality: ”Port Angeles, Wisconsin” (USA), female holotype and three female + one male paratypes are deposited in Department of Entomology, University of Wisconsin, Madison, two female paratypes are in National Museum of Natural History, Washington; the latter two paratypes examined.

Microchelonus shenefelti (McComb, 1968): SHENEFELT 1973: 903 (comb. n., literature up to 1968).

Material examined: 1.) *M. fulgidus*: one female (in Budapest): Maine, Franklin County, Strong (USA), 9 July 1976, leg. Heinrich, det. J. Papp 2014.
2.) *M. shenefelti*: two female paratypes (in Washington): Mt. Pleasent, Port Angeles, Wisconsin (USA), 18 July 1945, leg. R. D. Shenefelt, det. McComb.

In McComb's identification key the species *M. fulgidus* is coupled with *M. shenefelti*, see key-couplet 62 (in MCCOMB 1968: 10, couplet 62). The two species, very near to each other, are distinguished by three features: size of eye, sculpture of face and scutellum. A comparison of the two species the distinctive features between them are modified and completed with further traits:

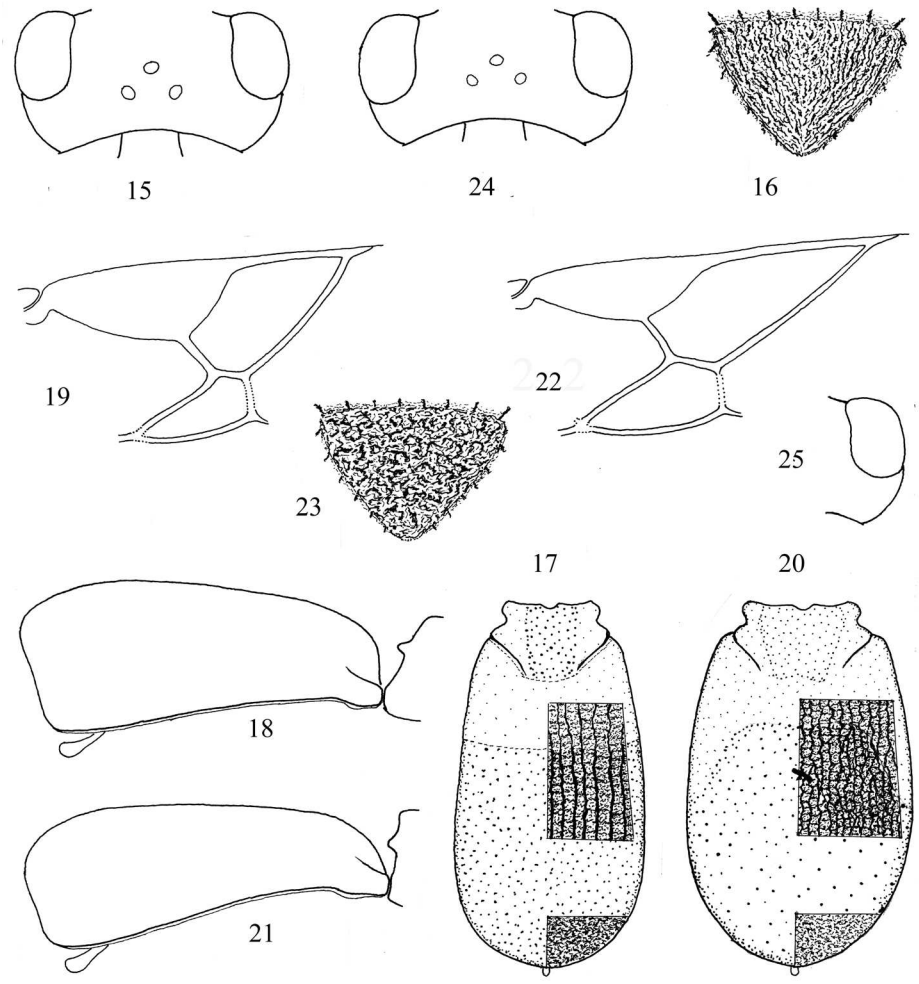
1 (2) Carapace in dorsal view (Fig. 17) somewhat less broadening, 1.9 times as long as broad posteriorly; in lateral view high (Fig. 18), 2.4 times as long as high behind. Striation of carapace straight and slightly stronger (Fig. 17). Fore wing: 1–R1 shorter, 0.6 times as long as pterostigma, pterostigma itself wide: 2.3 times as long as wide (Fig. 19). Scutellum longitudinally striolate (Fig. 16). Head in dorsal view a bit less transverse: 1.9 times as broad as long, eye 1.8 times as long as temple (Fig. 15). Basal band of carapace straw yellow. ♀: 3–3.2 mm. – USA: Connecticut, Maine.....***M. fulgidus*** (McComb, 1968)

2 (1) Carapace in dorsal view (Fig. 20) somewhat more broadening, 1.6 times as long as broad medially; in lateral view less high (Fig. 21), 2.6 times as long as high behind. Striation of carapace slightly less straight and slightly less strong (Fig. 20). Fore wing: 1–R1 nearly, 0.8 times, as long as pterostigma, pterostigma itself less wide: 2.6 times as long as wide (Fig. 22). Scutellum rugulose (Fig. 23). Head in dorsal view a bit more transverse, clearly twice as broad as long, eye 1.9 times longer than temple (Figs 24–25). Basal band of carapace yellow, colour continuing laterally up to middle. ♀: 3.4–3.6 mm. – USA: Wisconsin .....***M. shenefelti*** (McComb, 1968)

Remark: In both species eye in lateral view 0.7–0.8 times as high as wide. Also the face of the two species laterally rather aciculate and medially rather subrugulose to rugulose. Consequently the eye measurements in lateral view as well as the facial sculpture do not appear as specific distinctive features (cf. MCCOMB 1968: 10, key-couplet 62).

Checklist of the *Microchelonus* species of the Nearctic Region

Besides the fairly well-known Palaearctic species of the genus *Microchelonus* the Nearctic species are moderately explored. The first species was described by Cresson in 1865 under the name *Chelonus laevifrons*. Chronologically the following authors have been contributed to the increase of our knowledge concerning the *Microchelonus* species: CRESSON (1865, 1873), PROVANCHER (1881, 1886), CAMERON (1887), ASHMEAD (1889), VIERECK (1905, 1911, 1925), GAHAN (1917, 1919) and CUSHMAN (1931). The most fruitful specilist was McComb who alone increased the number of the *Microchelonus* species by describing 91 new species in 1965 and 1968. Besides the Russian V. I. Tobias the American Ch. W. McComb is the second productive in discovering new *Microchelonus*



Figs 15–25. — Figs 15–19. *Microchelonus fulgidus* (McComb) ♀: 15 = head in dorsal view, 16 = scutellum, 17 = carapace in dorsal view with indication of its sculpture, 18 = carapace in lateral view, 19 = distal part of right fore wing. — Figs 20–25. *Microchelonus shenefelti* (McComb) ♀: 20 = carapace in dorsal view with indication of its sculpture, 21 = carapace in lateral view, 22 = distal part of right fore wing, 23 = scutellum, 24 = head in dorsal view, 25 = right part of head in dorsal view.

species. His monographic publication (in 1968) is a basic and standard survey viewing the Nearctic species of *Microchelonus*.

All these authors originally arranged the new species in a few generic compositions: either simply in *Chelonus*, in *Chelonella* or in *Chelonus* (*Microchelonus*) and never simply in *Microchelonus* (see also the checklist). In his world-catalogue SHENEFELT (1973) was the first author consistently arranging the species in the genus *Microchelonus* disregarding their subgeneric affiliation. YU et al. (2012) applied the ”traditional” gene-

ric arrangement: *Chelonus* (*Microchelonus*). In the present survey *Microchelonus* is recognized as valid genus. Further generic comments see in the Palaearctic version. Contrarily to the six subgeneric divisions of the Palaearctic *Microchelonus* species every Nearctic species belongs to the nominate subgenus *Microchelonus* s. str.

Up to now a total of 113 *Microchelonus* species are registered in the Nearctic Region. Similar to the Palaearctics it may be predict that the known number (113) of the Nearctic species will be increased in the future about to two-three times more. This increasion presumes the intensification of the respective special research.

In the checklist the following abbreviations are applied:

The names of the federal states of the U.S.A. as well as the federal territories of Canada are abbreviated according to those presented in "*Catalog of Hymenoptera in America North of Mexico, 1979*":

Ala. = Alabama
Alta. = Alberta
Ariz. = Arizona
B.C. = British Columbia
Cal. = California
Chel. = Chelonus
(Ch.[Mch.]) = (Chelonus [Microchelonus])
Colo. = Colorado
Conn. = Connecticut
D.C. = District of Columbia
Fla. = Florida
Ga. = Georgia
Ida. = Idaho
Ill. = Illinois
Ind. = Indiana
introd. = introduced
Kans. = Kansas
La. = Lousiana
Mai = Maine
Man. = Manitoba
Mass. = Massachusets
Md. = Maryland
Mich. Michigan
Minn. = Minnesota
Mo. = Missouri
Mont. = Montana
N.Car. = North Caroline
N.Dak. = North Dakota
Neb. = Nebraska
N.H. = North Hampshire
N.J. = New Jersey
N.S. = Nova Scotia
N.Y. = New York
Ont. = Ontario
Oreg. = Oregon
Que. = Quebec
Pa. = Pennsylvania
P.E.I. = Prince Edward Island
P.R.C. = People's Republic of China
S.Dak. = South Dakota
Sask. = Saskatchewan
Tex. = Texas
Va. = Virginia
USA = United States of America
Vt. = Vermont
Wash. = Washington
Wis. = Wisconsin
Wyo. = Wyoming

Checklist of the species:

aberrans (McComb, 1968) (Ch.[Mch.]) — USA (Tex.)
abnormalis (McComb, 1968) (Ch.[Mch.]) — USA (Tex.)
absonus (McComb, 1968) (Ch.[Mch.]) — USA (Mont., Tex.)
aciculatus (McComb, 1968 (Ch.[Mch.]) — Canada (Que.), USA (Conn., Ill., Md., Minn., N.Car., N.Y., Pa., Va., Wis.)
acutigaster (McComb, 1968) (Ch.[Mch.]) — Canada (B.C.), USA (Cal., Neb.)
(*albobasilaris* [Ashmead, 1894] (*Chelonus*) = *cautus* (Cresson, 1872)
alius (McComb, 1968) (Ch.[Mch.]) — Canada (Ont.), USA (Minn., N.Y., Wisc.)
alpinus (McComb, 1968) (Ch.[Mch.]) — USA (Cal.)
anthracinus (McComb, 1968) (Ch.[Mch.]) — Canada (Que.)
argutus (McComb, 1968) (Ch.[Mch.]) — Canada (Yukon)

ashmeadii (Dalla Torre, 1898) (Chel.) — USA (Colo.)
= *atripes* (Ashmead, 1890) (Chel.) nec (Thomson, 1874) (*Chelonus*)
auricornis (McComb, 1968) (Ch.[Mch.]) — USA (Md., Va.)

basicinctus (Provancher, 1881) (Chel.) — USA (Conn., Ill., Kans., N.J., N.Y.)
batrachedrae (McComb, 1968) (Ch.[Mch.]) — USA (Mich.)
bickleyi (McComb, 1968) (Ch.[Mch.]) — USA (Ariz.)
blackburni (Cameron, 1886) (Chel.) — USA (Tex. introd.), introd. in many countries (in Austral-Oceania, Neotropics, West Palaearctics)
brevicornis (McComb, 1968) (Ch.[Mch.]) — USA (Fla.)
brevifemur (McComb, 1968) (Ch.[Mch.]) — USA (Cal.)
bucculentus (McComb, 1968) (Ch.[Mch.]) — USA (Maine, Mich., N.H., N.J., N.Y., S.Dak., Utah)
burksi (McComb, 1968) (Ch.[Mch.]) — USA (Tex.)

carinatus (Provancher, 1881) (Chel.) — Canada (Ont., Que.), USA (D.C., Ga., Fla., Mai., Mass., Mich., N.H., N.J., N.Y., S.Dak., Va.)
caulicola (McComb, 1968) (Ch.[Mch.]) — USA (Ind., Kans., N.Y., Ohio, S.Dak.)
cautus (Cresson, 1872) (Chel.) — USA (Ariz., Cal., La., Tex.), Honduras, Mexico, Nicaragua
= *albobasilaris* (Ashmead, 1894) (*Chel.*)
= *nucleolus* (Viereck, 1905) (Chel.)
ceanothi (McComb, 1968) (Ch.[Mch.]) — Canada (Ont.)
cephalanthi (McComb, 1968) (Ch.[Mch.]) — USA (Tex.)
chrysogaster (McComb, 1968) (Ch.[Mch.]) — USA (Iowa)
clypealis (McComb, 1968) (Ch.[Mch.]) — USA (Ill., Iowa)
cnephasiae (McComb, 1968) (Ch.[Mch.]) — USA (Oreg., Wash.)
conformis (McComb, 1968) (Ch.[Mch.]) — USA (Wis.)
confusus (McComb, 1968) (Ch.[Mch.]) — USA (S.Dak., Tex.)
convexus (McComb, 1968) (Ch.[Mch.]) — USA (Cal.)
cosmopteridis (McComb, 1968) (Ch.[Mch.]) — USA (Md.)
crassus (McComb, 1968) (Ch.[Mch.]) — USA (Fla.)
cushmani (McComb, 1968) (Ch.[Mch.]) — USA (Va.)
cylindricus (McComb, 1968) (Ch.[Mch.]) — Canada (B.C.), USA (Colo., Wyo.)

declivis (McComb, 1968) (Ch.[Mch.]) — Canada (Que.)
deplanus sp. n. — Canada (Ont.)
disjunctus (McComb, 1968) (Ch.[Mch.]) — USA (Md.)
disparilis (McComb, 1969) (Ch.[Mch.]) — Canada (B.C.), USA (Cal., Colo., Nev., Oreg., Utah)
dolicocephalus (McComb, 1968) (Ch.[Mch.]) — USA (Ariz., Cal., Oreg.)
dreisbachi (McComb, 1968) (Ch.[Mch.]) — USA (Ill., Md., Mass., Mich., N.Car., N.J., N.Y., Pa.)

egregicolor (Viereck, 1905) (Chel.) — USA (Conn., D.C., Ill., Iowa, Kans., Md., Mass., N.Car., N.H., N.Y., Ohio, S.Dak., Va.)
elasmopalpi (McComb, 1968) ((Ch.[Mch.]) — USA (Fla., Ga., Tex.)
empherus (McComb, 1968) (Ch.[Mch.]) — USA (Fla.)
eucosmae (McComb, 1968) (Ch.[Mch.]) — Canada (Ont.), USA (Mich., N.J., N.Y., Wis.)
euphorbiae (McComb, 1968) (Ch.[Mch.]) — USA (Ariz., Cal.)
eximius (McComb, 1968) (Ch.[Mch.]) — Canada (Que.), USA (Md., Maine, Mass., N.H., N.Y., Ohio, Pa., Vt.)

fissus (Provancher, 1881) (Chel.) — Canada (Ont., Que.), USA (Cal., Conn., Ill., N.H., N.J., N.Y.)
flavomarginalis (McComb, 1968) (Ch.[Mch.]) — USA (Fla.)
fulgidus (McComb, 1968) (Ch.[Mch.]) — USA (Conn., Ill.)
fumidus (McComb, 1968) (Ch.[Mch.]) — USA (Cal.)
fuscipennis (McComb, 1968) (Ch.[Mch.]) — Canada (N.S., Ont.), USA (Colo., Maine, Md., Mass., Mich., N.Dak., N.Y., Wis.)

gossipicola (McComb, 1968) (Ch.[Mch.]) — USA (Tex.)
gracilariae (McComb, 1968) (Ch.[Mch.]) — Canada (B.C.)
gracilis (McComb, 1968) (Ch.[Mch.]) — Canada (Alta.), USA (Cal., Oreg.)
grapholitae (McComb, 1968) (Ch.[Mch.]) — USA (Tex.)
hadrogaster (McComb, 1968) (Ch.[Mch.]) — USA (Ida., N.Dak., Wyo.)
heliopae (Gupta, 1955) (Chel.) — USA (Fla., La., Tex., introd.), India, Mexico (introd.)
hoppingi (Viereck, 1925) (Chelonella) — Canada (B.C.)
hurdi (McComb, 1968) (Ch.[Mch.]) — USA (Cal.)
hyalinus (McComb, 1968) (Ch.[Mch.]) — USA (Tex.)

improcerus (McComb, 1968) (Ch.[Mch.]) — USA (Cal.)
insolitus (McComb, 1968) (Ch.[Mch.]) — Canada (Man.)
insuetus (McComb. 1968) (Ch.[Mch.]) — Canada (Ont., Que.)
isolatus (McComb, 1968) (Ch.[Mch.]) — Canada (P.E.I.), USA (Wis.)

keiferiae (McComb, 1968) (Ch.[Mch.]) — USA (Va.)
krombeini (McComb, 1968) (Ch.[Mch.]) — Canada (Ont.), USA (Md., Mass., Pa.)

laevifrons (Cresson, 1865) (Chel.) — Canada (Ont.), USA (Colo.)
lavernae (Ashmead, 1889) (Chel.) — Canada (Ont.), USA (Ala., Ill., Miss., Mo., N.J., Ohio)
leptogaster (McComb, 1968) (Ch.[Mch.]) — USA (Cal., Wyo.)
longipalpis (McComb, 1968) (Ch.[Mch.]) — USA (Ill., Ind.)

marshi (McComb, 1968) (Ch.[Mch.]) — USA (Cal.)
masoni (McComb, 1968) (Ch.[Mch.]) — USA (Cal.)
medicaginis (McComb. 1968) (Ch.[Mch.]) — Canada (Alta.), USA Colo., S.Dak.)
minimus (Cresson, 1873) (Chel.) — USA (N.Y., Tex.)
montanus (McComb, 1968) (Ch.[Mch.]) — USA (Cal.)

nanus (Provancher, 1881) (Chel.) — USA (Cal.)
niger (McComb, 1968) (Ch.[Mch.]) —USA (Mo., Pa.)
nigripennis (Ashmead, 1889) (Chel.) — USA (D.C., Mass., N.Y., Va., Wis.)
(*nitobei* (Sonan, 1932) (Chelonella)) = *pectinipennis* (Cushman, 1931
(*nucleolus* (Viereck, 1905) (Chel.)) = *cautus* (Cresson, 1872)

pallidus (Ashmead, 1889) (Chel.) — USA (D.C., Md.)
paradoxus (McComb, 1968) (Ch.[Mch.]) — USA (Wis.)
paululus (McComb, 1968) (Ch.[Mch.]) — USA (Fla.)
pecki (McComb, 1968) (Ch.[Mch.]) — Canada (Sask.)
pectiniphorae (Cushamn, 1931) (*Chel.*[*Chelonella*]) — USA (Tex. introd.), Mexico (introd.), As.Ru., Korea, Japan, PRC
= *nitobei* (Sonan, 1932)
periplocae (McComb, 1968) (Ch.[Mch.]) — USA (Cal.)
petrovae (McComb, 1965) (Ch.[Mch.]) — USA (Cal., Ida.)
phthorimaeae (Gahan, 1917) (Chel.) — USA (Cal., Colo., Ida., La., N.J., Oreg., Tex., Utah, Va.), introd.: Mexico, Australia, Yemen
plesius (Viereck, 1925) (Chelonella) — Canada (B.C.)
ponderosae (McComb, 1968) (Ch.[Mch.]) — USA (Ariz.)
procericornis (McComb, 1968) (Ch.[Mch.]) — USA (Cal.)
prolatricornis (McComb, 1968) (Ch.[Mch.]) — Canada (P.E.I.)
proteus (Gahan, 1919) (Chel.[Chelonella]) — USA (Md.)
prunicola (McComb, 1968) (Ch.[Mch.]) — USA (Cal.)
punctatus (McComb, 1968) (Ch.[Mch.]) — USA (Cal.)
punctipennis (McComb, 1968) (Ch.[Mch.]) — Canada (Ont.)

quadriceps (McComb, 1968) (Ch.[Mch.]) — USA (Ala., Colo., Minn., S.Dak.)

recurvariae (McComb, 1968) (Ch.[Mch.]) — Canada (Ont.), USA (Mich., Wis.)
rubiginis (McComb, 1968) (Ch.[Mch.]) — USA (La.)
rufiscapus (Provancher, 1886) (Chel.) — Canada (B.C., N.S., Ont., P.E.I., Que.), USA (Ill., Ind., Mass., Mich., N.Car., N.Y., S.Dak.,Va., Wis.)

sailari (McComb, 1968) (Ch.[Mch.]) — Canada (Yukon), USA (Alaska)
salicis (McComb, 1968) (Ch.[Mch.]) — USA (Cal.)
sculleni (McComb, 1968) (Ch.[Mch.]) — USA (Oreg.)
severini (McComb, 1968) (Ch.[Mch.]) — USA (S.Dak.)
shenefelti (McComb, 1968) (Ch.[Mch.]) — USA (Wis.)
shoshoneanorum (Viereck, 1911) (Chel.) — USA (Ariz., Colo., Ida., N.Mex., Wyo.)
similis (McComb, 1968) (Ch.[Mch.]) — USA (Cal.)
spinosus (McComb, 1968) (Ch.[Mch.]) — USA (N.J., Ohio)
subtuberculatus (McComb, 1968) (Ch.[Mch.]) — Canada (Sask., Yukon), USA (Colo.)
suturalis (McComb, 1968) (Ch.[Mch.]) — USA (Colo.)

tenuicornis (McComb, 1968) (Ch.[Mch.]) — USA (Md.)
teretiventris (McComb, 1968) (Ch.[Mch.]) — USA (Colo.)
tuberculatus (McComb, 1968) (Ch.[Mch.]) — USA (N.Mex.)

vulgaris (McComb, 1968) (Ch.[Mch.]) — USA (S.Dak.)

walkleyae (McComb, 1968) (Ch.[Mch.]) — USA (S.Dak.)

Checklist of the *Microchelonus* species of the Palaearctic Region

The species composition of the genus *Microchelonus* in the Palaearctic Region is known fairly well – compared our knowledge in this respect to other regions. The first *Microchelonus* species have been described from Europe in the 19th century by NEES (1816), DAHLBOM (1833), HERRICH-SCHÄFFER (1838), REINHARD (1867), THOMSON (1874), KOKOUJEW (1899) and SZÉPLIGETI (1896, 1898, 1908). In the first half of the 20th century FAHRINGER (1934) and TELENGA (1941) have broadened the circle of *Microchelonus* describing species outside Europe too. The extremely productive expert in the second half of the 20th century, as indicated before, is TOBIAS (1986, 2010), he alone significantly multiplied the number of the Palaearctic species. ABDINBEKOVA (1971) is the author of several *Microchelonus* species taken in Azerbaijan. Papp described mainly from the East Palaearctics (Mongolia, Korea) new *Microchelonus* species in the last two decades of the 20th century (PAPP 1971, l989) as well as redescribed Thomson's, Wesmael's, Dahlbom's, Silvestri's and Szépligeti's *Microchelonus* species (PAPP 1990–2004). LOZAN & TOBIAS (2002, 2006) and TOBIAS & LOZAN (2003, 2005, 2006) have described nine new species (mainly from Czechia) and redescribed fifteen known species (originally described mainly by Tobias). CHEN & JI (2002) published a monographic book of the Cheloninae species of China with the description of thirtythree new species accomplished with eight known species of *Microchelonus*; i.e. currently a total of 41 *Microchelonus* species are registered in China (P.R.C.). YU et al. (2012) catalogued the *Microchelonus* species under the subgeneric *Chelonus* (*Microchelonus*) name following van Achterberg's conception of the taxonomic position of "*Microchelonus*". In this respect it seems reasonable to quote van Achterberg's taxonomic opinion which

is, in my standpoint, an extreme relevancy: "*This species [kermakiae Tobias, 2001 my insertion] fits in the genus Microchelonus Szépligeti as used by e.g., TOBIAS (1986, 2001), but this genus is not tenable (probably even not as subgenus); see van ACHTERBERG & POLASZEK (1996) and BRAET & van ACHTERBERG (2001)*" (van ACHTERBERG & MEHRNEJAD 2002: 31). Ten years later, however, this taxonomic opinion was not followed: van Achterberg as the second author in YU et al. (2012) the taxon *Microchelonus* was treated as the subgenus of *Chelonus*. In the catalogue by YU et al. (2012), however, several species by Tobias and Chen & Ji are omitted or placed in *Chelonus* s. str.

At present the total number of the *Microchelonus* species is 488 (including five species with question-mark) in the Palaearctic Region. Nearly twice more new species have been described from the Eastern Palaearctic Region than from the western one. The number, however, will be considerably increased by the description of the new species mainly from China, Korea, Mongolia, southern Asiatic Russia, Middle East (arabian countries, Iran, Afghanistan) and the Mediterranean Subregion.

Following TOBIAS's (2010, 2011) subgeneric distinction the Palaearctic species of *Microchelonus* are arranged in six subgenera. The overwhelming majority of the species belongs to the subgenus *Microchelonus* s. str.; the rest of the species, 25 ones, are divided in among six subgenera, subsequently they are listed with their species composition in alphabetic order:

Carinichelonus Tobias, 2000: *M*. (*C*.) *carinatikovi* Shenefelt, 1973.

Microchelonus Szépligeti, 1908 s. str.: the overwhelming majority of the species.

Parachelonus Tobias, 1995: *M*. (*P*.) *gravenhorsti* (Nees, 1816), *M*. (*P*.) *magnipunctus* Tobias, 1984, *M*. (*P*.) *ovalis* Tobias, 1984, *M*. (*P*.) *pellucens* (Nees, 1816), *M*. (*P*.) *rubriventris* (Tobias, 1988), *M*. (*P*.) *starki* (Telenga, 1953) and *M*. (*P*.) *xanthofossa* Tobias, 2000.

Rasnichelonus Tobias, 2011: *M*. (*R*.) *elongatus* Papp, 1971.

Scabrichelonus He, Chen et van Achterberg, 1997: *M*. (*S*.) *sinensis* (He, Chen et van Achterberg, 1997).

Stylochelonus Hellén, 1958: *M*. (*S*.) *cariniventris* Tobias, 1996, *M*. (*S*.) *clausus* Tobias, 1996, *M*. (*S*.) *elachistae* Tobias, 1995, *M*. (*S*.) *elongatus* Papp, 1971, *M*. (*S*.) *interpositus* Tobias, 1995, *M*. (*S*). *karadagi* Tobias, 1995, *M*. (*S*.) *koponeni* Tobias, 1995, *M*. (*S*.) *lissofossa* Tobias, 2000, *M*. (*S*.) *magadani* Tobias, 1994, *M*. (*S*.) *magnipunctus* Tobias, 1984, *M*. (*S*.) *mucronatus* (Thomson, 1874), *M*. (*S*.) *pedator* (Dahlbom, 1833), *M*. (*S*.) *pusillus* Szépligeti, 1908, *M*. (*S*.) *septemdecimplex* Tobias, 1986 and *M*. (*S*.) *subpedator* Tobias, 1995.

Two homonymies are solved by creating new names:

Microchelonus bres nom. n. (Tobias in litt.)

= *M. brevicornis* Tobias, 1989 (jun. hom.) nec McComb, 1968 (sen. hom.)

Microchelonus nigripedator nom. n. (Tobias in litt.)

= *M. nigripes* Tobias, 1996 (jun. hom.) nec Rao et Chalikwar, 1971 (sen. hom.)

On the homonymies of *Microchelonus uniformis* Tobias, 1994 and *Megachelonus uniformis* Baker, 1926 see my taxonomic remark in the Faunistic List (at *M. uniformis* Tobias).

Unnecessary replacement of two names: *Microchelonus latens* and *M. probabilis* are by STERZYSKI in HUFLEJT (1997) for the two Niezabitowski's names: *M. cingulipes* (Niezabitowski, 1910) and *M. foveolatus* (Niezabitowski, 1910). Niezabitowski's two names are valid (i.e. are not homonyms or synonyms), however, their type specimens should be re-examined to clarify their true taxomomic states.

In the checklist the following abbreviations are applied:

A = Austria
AF = Afghanistan
AltMt = Altay Mts
ARM = Armenia
AsRu = Asiatic Russia
Astr = Astrakhanskaya Oblast
AZ = Azerbaijan
B = Belgium
Baik = Baikal Oblast
BG = Bulgaria
BI-H = Bosnia-Herzegovina
Bur = Buryatiya
BY = Byelorussiya / Belarus
CauMt = Caucasus Mts
CH = Switzerland
Chel = Chelyabinsk Oblast
Chit = Chita Krai
Cr = Crete
Cri = Crimea
CRO = Croatia
CY = CyprusCZ = Czechia
D = Germany
Dagh = Daghestan
DZ = Algeria
E = Spain
EUR = Europe
ET = Egypt
EurRu = European Russia
F = France
FI = Finland
Fu = Fujian
GB = Great Britain
GE = Georgia
GR Greece
H = Hungary
Hain = Hainan
Hang = Hangchow
He = Henan
Hu = Hubei
I = Italy
IL = Israel
IR = Iran
J = Japan
Ji = Jilin
JOR = Jordan
Kalm = Kalmykiya
Kam = Kamchatka
Kar = Karelia
Kaza = Kazachiy
KAZ = Kazakhstan
Khab = Khabarovskiy Krai
KIR = Kirghizia
KolPen = Kol'skiy Peninsula
KOR = Korea
Kras = Krasnodar Krai
Kur = Kurili Islands
Lia = Liaoning
LT = Lithuania
LV = Latvia
MA = Morocco
MAC = Macedonia
Mag = Magadan Oblast
MOL = Moldavia / Moldava
Mos = Moscow Oblast
MON = Mongolia
MR = Montenegro / Crna Gora
Mur = Murmansk Krai
NL = Nederland
Novs = Novosibirsk
Novg = Novgorod
Oren = Orenburg Oblast
Oset = Osetinskaya Respublika
PAK = Pakistan
PAL RE = Palaearctic Region
PL = Poland
PRC = China (main)
Prim = Primorski Krai
RO = Romania
RU = Russia
S = Sweden
Sak = Sakhalin
Sar = Saratov Oblast
Shand = Shandong
Shanx = Shanxi
Sib = Siberia
SK = Slovakia
SL = Slovenia
So = Sochi
SRB = Serbia
SYR = Syria
Tchel = Tchelyabinsk Oblast
TiShMt = Tien Shan Mts
TJ = Tadzhikistan
TN = Tunesia
TR = Turkey
TraBai = Transbaikal Krai
Tu = Tuva
TUR = Turkmenistan
UA = Ukraine
UrMt = Ural Mts
UZ = Uzbeghistan
VolgDe = Volga Delta
Volgog = Volgogradskaya Oblast
Xinj = Xinjiang
Yak = Yakutia
YAR = Yemen
Yaro = Yaroslav Oblast
Yun = Yunnan

Checklist of the species

abditus (Tobias, 1961) (*Chelonus*) — AsRu (Prim)
abstrusus Tobias, 1989 — AsRu (Prim)
?*acuminatus* (Herrich-Schäffer, 1838) (*Chelonus*) sen. hom.?
= *pusillus* Szépligeti, 1908 jun. syn.?
acutiusculus Tobias, 2001 — UZ
acutulus Tobias, 1997 — NL, KAZ, UZ, AsRu (Tu)
(*adjaricus* Tobias, 1976) = *gravenhorsti* (Nees, 1816)
adjunctus Tobias, 1989 — AsRu (Prim)
aelleniae Tobias, 1997 — TUR, UZ
agathis Papp, 1971 — MON, AsRu (Chit)
akmolensis (Tobias, 1964) (*Neochelonella*) — KAZ
alaicus Tobias, 1991 — KIR
(*alboannulatus* [Szépligeti, 1896]) = *pellucens* (Nees, 1816)
albomacula Tobias, 2001 — CZ
albor Tobias, 1994 — RO, TR, AsRu (Prim)
alexeevi Tobias, 1989 — TUR
= *apicalis* Alexeev, 1971 nec Papp, 1971
algiricus Tobias, 2001 — DZ
alter Tobias, 2000 — AsRu (Bur)
alternator Ji et Chen, 2002 — PRC (Fu, Hu)
alticinctus Tobias, 1989 — AsRu (Sak)
altilis Tobias, 1989 — AsRu (Prim, Kur)
alveatus Tobias, 1989 — AsRu (Prim)
amandus Tobias, 1989 — AsRu (Prim)
amurensis Tobias, 1984 — AsRu (Khab, Prim)
(*analipennis* [Fahringer, 1934]) (*Chelonus* [*Chelonella*]) = *erosus* (Herrich-Schäffer, 1838)
angustatus Tobias, 1989 — AsRu (Prim)
angustiventris Tobias, 1986 — AsRu (Prim)
angustulus Tobias, 2000 — AsRu (Prim)
anivicus Tobias, 2000 — AsRu (Prim)
antropovi Tobias, 1997 — KAZ, TUR
anxius Tobias, 1992 — AsRu (Tchel, Chit)
(*apicalis* Alexeev, 1971 nec Papp, 1971)
= *alexeevi* Tobias, 1986
apicalis Papp, 1971 — MON
apistae Tobias, 1989 — AsRu (Bur, Chit), MON
arcuatilis Tobias, 1986 — MO
areolatus (Cameron, 1906) (*Chelonus*) — IR, TUR, PAK
arnoldi (Tobias, 1964) (*Neochelonella*) — H, RO, EurRu (Sar), KAZ
artoventris Tobias, 1997 — KAZ, AsRu (Mag)
= *stenogaster* Tobias, 1995b: 423 nec 1995a: 67
artus Tobias, 1986 — E, BG, MO, ARM, TR
assimilis Tobias, 1990 — AsRu (Prim), MON
atripes (Thomson, 1874) (*Chelonus*) — Palaearctic Region
= *cunctator* Papp, 1971
= *kamtshaticus* Tobias, 1986
atrotibia Papp, 2012 — IL
azerbajdzhanicus (Abdinbekova, 1971) (*Chelonus*: *Neochelonella*) — E, D, CRO, GR, AZ, ARM

badachshanicus Tobias, 1991 — TJ
balchanicus Tobias, 1999 — TUR
balkanicus Tobias, 2003 — CRO, H, IL

balkashensis Tobias, 2002 — KAZ
basalis (Curtis, 1837) (*Chelonus*) — Western Pal Re
baskunchakenis Tobias, 2005 — EurRu (Astr)
belokobylskiji Tobias, 1984 — AsRu (Prim)
bicoloripes Tobias, 1990 — AsRu (Prim)
bidentulus Tobias et Lukaš, 1997 — CH, SK, BY, AsRu (Khab, Prim, Sak)
bifidus Tobias, 2000 — AsRu (Prim)
bifurcatus Tobias, 2000 — AsRu (Prim)
bigener Tobias, 1995 — AsRu (Khab)
bigus Tobias, 1995 — AsRu (Kam, Mag, Prim)
biliosus Tobias, 1995 — AsRu (Mag)
bimaculatus Ji et Chen, 2002 — PRC (Fu)
binus Tobias, 1995 — AsRu (Prim)
bituminalis Tobias, 1995 — AsRu (Kam, Mag)
bitumineus Tobias, 1995 — AsRu (Prim)
blackburni (Cameron, 1886) (*Chelonus*) — Egypt, introd.
= *carinatus* Cameron, 1881 (homonym)
= *cameroni* Dalla Torre, 1898
bosonohyi Tobias et Lozan, 2006 — CZ
bres nom. n. — MON
= *brevicornis* Tobias, 1989 nec McComb, 1968
brevicella Tobias, 1995 — AsRu (Kur.)
(*brevicornis* Tobias, 1989) = *bres* nom. n.
brevifemoralis Tobias, 1989 — MON
brevigenis (Tobias, 1964) (*Neochelonella*) — SK, LT, EurRu (VolgObl), KAZ, KIR, MON
brevimetacarpus Tobias, 1995 — H, TR, AsRu (Mag)
brevioculatus Tobias, 2000 — AsRu (Prim)
breviradialis Tobias, 1989 — AsRu (Chit), MON
breviradis Chen et Ji, 2002 — PRC (Fu)
brevis (Tobias, 1976) (Chelonus) — EurRu (KraKr, So)
brunniventris Tobias, 1997 — KAZ
= *multistriatus* Tobias, 1997
budapesti Tobias, 1999 — H, CRO
?= *talyshicus* Tobias, 2003
budrysi Tobias, 1997 — TUR
burjaticus Tobias, 2000 — AsRu (Bur)

calcaratus Tobias, 1989 — MAC, SYR, TR, MON
calligoni Tobias, 2001 — TUR
capsulifer Tobias, 2000 — AsRu (Prim)
carinatikovi Shenefelt, 1973 — AsRu (Prim)
= *carinatus* Shestakov, 1940 nec (Provancher, 1881)
= *cavifrons* Tobias, 2000
(*carinatus* Shestakov, 1940)) = *carinatikovi* Shenefelt, 1973
carinigaster Tobias, 2000 — AsRu (Prim)
cariniventris Tobias, 1996 — MON
(*caucasicus* [Abdinbekova, 1967] (*Neochelonella*) = *kopetdagicus* (Tobias, 1966)
(*caudatus* [Thomson, 1874]) = *retusus* (Nees, 1816)
(*cavifrons* Tobias, 2000) = *carinatikovi* Shenefelt, 1973
chalchingoli Tobias, 1989 — AsRu (Chit), TJ, MON
changaicus (Tobias, 1972) (*Chelonus* [*Microchelonus*]) — MON
chasanicus Tobias, 2000 — JOR, AsRu (Prim)
chinensis (Zhang, 1984) (*Chelonus*) — PRC (He, Hu, Lia, Shand, Shanx)
chrysobasis Tobias, 2000 — J
chrysomacula Tobias, 1997 — MON

chrysotegula (Tobias, 1964) (*Neochelonella*) — KAZ, KIR, MON
chrysozona Tobias, 1989 — MON
chrysopedes Ji et Chen, 2002 — PRC (Hu)
cinctipes Tobias, 2000 — AsRu (Prim)
cingulipes (Niezabitowski, 1910) (*Chelonus*) — PL
= *probabilis* Sterzyski, 1997
circulariforameni Chen et Ji, 2002 — PRC (Fu)
circumfissuralis Tobias, 2003 — EurRu (VolgObl)
circumfossa Tobias, 2002 — CRO, TR, AsRu (Prim)
circumrimosus Tobias, 2003 — TJ
cisapicalis Tobias, 1989 — AsRu (Chit, Prim), MON
clausus Tobias, 1996 — AsRu (Kam), MON
compositus Tobias, 1989 — MON
(*compressiscapus* [Szépligeti, 1898]) = *contractus* (Nees, 1816)
compressor Ji et Chen, 2002 — PRC (Fu)
concentralis Chen et Ji, 2002 — PRC (Fu)
continens Tobias, 1989 — H, MAC, TR, AsRu (TraBai, Tu), MON
contractellus Tobias, 1991 — TJ
contractus (Nees, 1816) (*Sigalphus*) — PAL RE
= *compressiscapus* (Szépligeti, 1898) (*Chelonus*)
crassitarsis Tobias, 1989 — MON
cratospilumi Ji et Chen, 2002 — PRC (Fu)
cretensis Tobias, 1999 — GR (Cr) (? = *kopetdagicus* Tobias, 1966)
creteus Tobias, 2000 — AsRu (Prim)
(*cunctator* Papp, 1971) = *atripes* (Thomson, 1874)
curtigenis Tobias, 1989 — AsRu (AltMt), MON
curtimetacarpus Tobias, 2000 — AsRu (Prim)
curtus Tobias, 1996 — MON
curvimaculatus (Cameron, 1906) (*Chelonus*) — Ethiopian Region; introd.: Egypt
(*curvisulcatus* [Szépligeti, 1896]) = *sulcatus* (Jurine, 1807)
cyprensis Tobias, 2001 — CY
cypri Tobias, 2001 — CY

daanyuanensis Chen et Ji, 2002 — PRC (Fu)
denticulatus Tobias, 1986 — CZ, MAC, MOL
depressus (Thomson, 1874) — FI, S
devexus Tobias, 1989 — MON
devius (Tobias, 1964) (*Neochelonella*) — CRO, GR, SRB, MR, EurRu, KAZ, KIR, UZ
(*dilatus* Papp, 1971) = *microphthalmus* (Wesmael, 1838)
discoloratus Tobias, 1989 — AsRu (Bur, Prim)
(*dispar* [Marshall, 1885]) (*Chelonus*) = *fenestratus* (Nees, 1816)
dolosus Tobias, 1989 — S, DK, H, CRO, MAC, TR

eaous Tobias, 2000 — AsRu (KhaKr, Prim)
elachistae Tobias, 1995 — PL, CZ, H, GE, TR
elaeaphilus (Silvestri, 1907) (*Chelonus*) — I, TN, IL, YAR
elegantulus Tobias, 1986 — AsRu (Prim), J, PRC
= *hiator* Tobias, 1990
elenae Tobias, 1995 — UZ
elongates Ji et Chen, 2002 — PRC (Fu)
elongatus Papp, 1971 — AsRu (Chit), MON
= *rasnitsyni* Tobias, 1992
?*emarginatus* (Herrich–Schaeffer, 1838) (*Chelonus*) ?= *retusus* (Nees, 1816)
emeljanovi Tobias, 1989 — MON
endomius Papp, 1989 — KOR

equalis Chen et Ji, 2002 — PRC (Ji)
erdosi Tobias, 2001 — CY, IL, SY
ergeniensis Tobias, 2002 — EurRu (VolgObl)
ermolenkoi Tobias, 2001 — UA
erosus (Herrich–Schaeffer, 1838) (*Chelonus*) — EUR
= *analipennis* (Fahringer, 1934)
= *frivaldszkyi* Shenefelt, 1973
= *hungaricus* (Szépligeti, 1896)
errabundus Tobias, 1989 — MON
erraticus Tobias, 1989 — MON
(*erraticus* Tobias, 1994 nec 1989) = *erratus* Tobias, 1999
erratus 1999 — H, RO, AsRu (Prim, Kur)
= *erraticus* Tobias, 1994 nec 1989
erroneus Tobias, 1898 — MON
erythrogaster (Luc, 1846) (*Chelonus*) — DZ, TN, I, CRO, AsRu (OrRe)
erythrosoma (Tobias, 1964) (*Neochelonella*) — UA, KAZ
eugenii Tobias, 1999 — UZ (TiSh)
eurous Tobias, 1989 — AsRu (Chit), MON
(*eurytheca* [Wesmael, 1838]) (*Chelonus*) = *gravenhorsti* (Nees, 1816)
(*excavatus* [Tobias, 1972]) (*Chelonus* [*Microchelonus*]) = *exilis* (Marshall, 1885)
excisus Tobias, 1990 — AsRu (Prim)
exilis (Marshall, 1885) (*Chelonus*) — PAL RE
= *excavatus* (Tobias, 1972)
= *irrepertus* Tobias, 1994, partim
(*exilis* [Marshall, 1885] *sensu* Tobias, 1986) = *microphthalmus* (Wesmael, 1838)

falkovitshi Tobias, 2001 — UZ
fatigatus Papp, 1981 — H
fenestratus (Nees, 1816) — PAL RE
= *dispar* (Marshall, 1885)
ferganicus Tobias, 2001 — UZ
ferulae Tobias, 2001 — KAZ
fischeri Tobias, 1994 — P, E, F, A, H, FI, LT, BG, EurRu (Kar), TR
fisetshkoi Tobias, 1997 — KAZ, TJ
fissilis Tobias, 1985 — GE, TR
(*fissuralis* [Tobias, 1964] *Neochelonella*) = *risorius* (Reinhard, 1867)
(*fissus* [Szépligeti, 1900] (*Chelonus*) nec Provancher, 1881) = *risorius* (Reinhard, 1867)
flagellaris Tobias, 1989 — AsRu (Prim)
flavicoxis Tobias, 2000 — AsRu (Prim)
flavipalpis (Szépligeti, 1896) (*Chelonus*) — H, MOL, GE, UA, EuRu, AsRu (Chit, Sak), AZ, ARM, MON
flavonaevulus (Abdinbekova, 1971) (*Chelonus*) — F, BG, MAC, GR, EuRu (Dag), AZ, TR
flavoscaposus Tobias, 2001 — I
foersteri Tobias, 1999 — D, CZ, LV, RO, GR
formosovi Tobias, 2001 — AsRu (Nov)
fornicatus Tobias, 2000 — AsRu (Prim, Sak)
fortispinus (Cameron, 1906) (*Chelonus*) — MON, PAK
foveiventris Tobias, 1989 — MON
foveolatus (Niezabitowski, 1910) (*Chelonus*) — PL
= *latens* Sterzyski, 1997
frater Tobias, 1990 — KIR, MON
fraternus Tobias, 1990 — AsRu (Chit, Prim), MON
(*frivaldszkyi* Shenefelt, 1973) = *erosus* (Herrich–Schaeffer, 1838)
frontalis Tobias et Lozan, 2006 — CZ, H
fujianensis Ji et Chen, 2002 — PRC (Fu)

fumipennis Tobias, 1986 — SK, H, BG, MOL, AsRu (Prim)
furtivus Tobias, 1986 — EuRu (So)

genalis Tobias, 1989 — MON
glabrifrons Chen et Ji, 2002 — PRC (Hu, Ji)
gladiclypis Ji et Chen, 2002 — PRC (Fu)
graciflagellum Chen et Ji, 2002 — PRC (Fu)
gracitis Lozan et Tobias, 2005 — CZ, MAC, GR, TR
gratus Tobias, 1989 — AsRu (Chit), MON
gravenhorsti (Nees, 1816) (*Sigalphus*) — PAL RE
= *adjaricus* Tobias, 1976
= *eurytheca* (Wesmael, 1838)
= *maculator* (Dahlbom, 1833)
= *tricolor* Tobias, 1976
guadunensis Ji et Chen, 2002 — PRC (Fu)
gussakovskii Tobias, 1997 — TUR, TJ

halperini Papp, 2012 — IL
helleni Tobias, 1999 — BG, MAC
hemiagathis Tobias, 1992 — AsRu (Chit)
heraticus Tobias, 1985 (*Chelonus*?) — AF
herbigradus Tobias, 2000 — AsRu (Prim)
(*hiator* Tobias, 1990) = *elegantulus* Tobias, 1986
?*hiemalis* (Gautier et Cleu, 1930) (*Chelonus*) — F, SK
hispanicus Tobias, 2001 — E
hofferi Tobias et Lozan, 2006 — CZ
holisi Chen et Ji, 2002 — PRC (Fu)
hubelensis Ji et Chen, 2002 — PRC (Hu)
(*hungaricus* [Szépligeti, 1896] Chelonus) = *erosus* (Herrich–Schaeffer, 1838)
hungaricus Szépligeti, 1908 — EUR, KAZ, MON
= *palpalis* Tobias, 1989
hurtus Papp, 1989 — KOR

ibericus Tobias, 2001 — E, CZ, TR, AsRu (Tu),
impressiventris Tobias, 1989 — MON
incisus Tobias, 1986 — NL, H, AsRu (Chel), MON
incrassus Papp, 1992 — FI
indericus Tobias, 2003 — AsRu (Tu), KAZ
insepultus Tobias, 1989 — KIR, TJ, MON
inserenus Tobias, 1989 — MON
insidiator Tobias, 1989 — H, ET, MON
insidiatrix Tobias, 1989 — MON
insidiosus Tobias, 1989 — MON
insincerus Tobias, 1986 — UA
insulanus Tobias, 2000 — AsRu (Kur), J
intercessor Tobias, 1996 — MON
interpositus Tobias, 1995 — KAZ
iranicus Tobias, 2001 — IR
irremeabilis Tobias, 1994 — AsRu (Prim)
(*irrepertus* Tobias, 1994) = *rugicollis* (Thomson, 1874)
irreprehensus Tobias, 1994 — AsRu (Kur, Prim)
irrisor Tobias, 1994 — AsRu (Kam, Prim)
irritator Tobias, 1994 — AsRu (Mag)
irritus Tobias, 1994 — SK, H, TUR, AsRu (Khab, Prim)

irrugator Tobias, 1994 — AsRu (Prim)
irruptus Tobias, 1994 — AsRu (Ur, Yar, Prim)
iskenderi Tobias, 2003 — TUR
istriensis Tobias, 2001 — SL

japonicus Tobias, 2000 — J
jilinensis Chen et Ji, 2002 — PRC (Ji)
jonaitsi Tobias, 2000 — AsRu (Mag)
jordanicus Tobias, 2001 — JOR
juldashevi Tobias, 2001 — UZ
jungi Chu, 1936 — PRC (Hang)
juniperi Tobias, 2010 — E
justus Tobias, 1989 — MON

kalmykorum Tobias, 2005 — EurRu (Kalm)
(*kamtshaticus* Tobias, 1986) = *atripes* (Thomson, 1874)
karadagensis Tobias, 2001 — CRO, UA (Cri), TR
karadagi Tobias, 1995 —UA (Cri)
karakalensis Tobias, 1997 — TUR
karakumicus (Tobias, 1966) (*Neochelonella*) — TUR
kasakhstanicus Tobias, 1997 — KAZ
kaszabi Tobias, 1989 — MON
kazenasi Tobias, 2001 — TUR
kermakiae Tobias, 2001 — IR, KIR
kerzhneri Tobias, 1989 — MON
keteper Tobias, 1997 — TUR
kievorum Tobias, 2008 — UA
kiritshenkoi (Tobias, 1976) (*Chelonus*) — BG, MAC, EurRu (Oset), AZ
kirvus Tobias, 1997 — EurRu (Novg)
klugei Tobias, 2001 — KAZ
kopetdagicus (Tobias, 1966) (*Neochelonella*) — H, EurRu, UA, AZ, KAZ, KI
= *caucasicus* (Abdinbekova, 1967)
koponeni Tobias, 1995 — S, CZ
koreanus Tobias, 2000 — KOR
korinthiacus Tobias, 2008 — GR
kostylevi Tobias, 2003 — D, H, BG, UA (Cri)
kotenkoi Tobias, 1992 — MAC, TR, AsRu (Chit)
kozlovi (Tobias, 1961) (*Chelonella*) — AsRu (Bur), MON
krivokhatskyi Tobias, 2005 — EurRu (Sar)
kughitangi Tobias, 1997 — TUR, TJ
kyrgisorum Tobias, 2003 — KIR

labipalpis Tobias, 1993 — FI, LT, EurRu (Novg), KAZ
lacteipennis Tobias, 1989 — MON
lamellosus Tobias, 2002 — AsRu (Prim)
laplandicus Tobias, 2001 — FI
(*latens* Sterzyski, 1997) = *foveolatus* (Niezabitowski, 1910)
laticeps Tobias, 1972 — MON
latifossa Tobias, 1990 — E, BG, TR, SYR, MON
latifunis Tobias, 1986 — AsRu (Khab, Prim)
latitemporis Tobias 2001 — KAZ
latrunculus (Marshall, 1885) (*Chelonus*) — PAL RE
= *rufipedator* Tobias, 1990
leleji Tobias, 2000 — AsRu (Kur)
leucomaculus Tobias, 1986 — MOL, AsRu (Chit), MON

lissocephalus Tobias, 2001 — KAZ
lissofossa Tobias, 2000 — AsRu (Mag, Prim)
lissoscutellaris Tobias, 2000 — AsRu (Prim)
lissosoma Tobias, 2000 — AsRu (Mag, Prim)
lodosus Tobias, 2000 — AsRu (Mag)
longidiastemus Ji et Chen, 2002 — PRC (Yun)
longihair Chen et Ji, 2002 — PRC (Ji)
longioculis (Tobias, 1964) (*Neochelonella*) — KAZ
longipedicellus Ji et Chen, 2002 — PRC (Yun)
longipes Tobias, 1984 — AsRu (Kur)
longirimosus Tobias, 1995 — KIR
longiusculus Tobias, 2000 — AsRu (Prim)
longiventris (Tobias, 1964) (*Neochelonella*) — D, H, SRB, LT, MOL, AZ, AsRu (Chit)
longulus Tobias, 1996 — MON
lugubris (Wesmael, 1835) — B, (?)PL
lunari Chen et Ji, 2002 — PRC (Ji)
lunaris Tobias, 1992 — AsRu (Baik)
luteipalpis Tobias, 1994 — TR, AsRu (Prim)
lutoga Tobias, 2000 — AsRu (Sak)
luzhetzkji (Tobias, 1966) (*Neochelonella*) — H, RO, EurRu (SE part), ARM, KAZ, TUR, TJ, MON

macrellips Tobias et Lozan, 2003 — CZ
macrocorpus Ji et Chen, 2002 — PRC (Fu)
(*maculator* (Dahlbom, 1833) (*Chelonus*) = *gravenhorsti* (Nees, 1816)
maculibasis Tobias, 2000 — J
madridi Tobias, 2008 — E
magadani Tobias, 1994 — AsRu (Mag)
magnifissuralis (Abdinbekova, 1971) (*Chelonus* [*Neochelonella*]) — CZ, MOL, KAZ, AsRu (Yak), MON
(*magnigfissus* Tobias, 1986) = *risorius* (Reinhard, 1867)
magnipunctus Tobias, 1984 — AsRu (Khab)
makarkini Tobias, 2000 — J
malinellae Tobias, 1997 — TUR
marshakovi Tobias, 1986 — AsRu (Chit, Mag, Prim), MON
mediterraneus Tobias, 2008 — GR
mellipes Tobias, 1990 — AsRu (Prim)
metatarsalis Tobias, 1997 — KAZ
microcella Tobias, 2005 — EurRu (Astr)
microfamosus Tobias, 2001 — BI–H
microphthalmus (Wesmael, 1838) — PAL RE
= *dilatus* Papp, 1971
= *exilis* (Marshall, 1885) sensu Tobias, 1986
mikhaili Tobias, 1989 — MON
milkoi Tobias, 2003 — KIR, IR
minifissus Tobias, 1996 — MON
minifossa Tobias, 1986 — DK, CZ, SK, H, MAC, TR
minutissimus (Tobias, 1964) — KAZ
minutus (A. Costa, 1884) (*Chelonus*) — I, D, CH, CRO, SK, H
(*minutus* [Szépligeti, 1898] (*Chelonus*) nec (A. Costa, 1884) = *vescus* (Kokujev, 1899)
mirabilis (Tobias, 1972) — MON
miscellae Tobias et Shaw, 2005 — GB
mishi Tobias, 1994 — AsRu (Prim), MON
mitigatus Papp, 1989 — KOR
moczari Papp, 2014 — IR
modestus Tobias, 1996 — MON
moldavicus Tobias, 1986 — MOL

mongolicus (Telenga, 1941) (*Chelonella*) — MON, AsRu (Chit)
= *planicornis* Tobias, 1989
monticola Tobias, 2003 —KAZ
moravicus Tobias et Lozan, 2003 —CZ
moroccanus Tobias, 2008 — MA, P, H
moskovitus Tobias, 1997 — EurRu (Mos)
mucronatus (Thomson, 1874) — S
multirimosus Tobias, 1996 — MON
(*multistriatus* Tobias, 1997) = *brunniventris* Tobias, 1997
mushana (Sonan, 1932) (Chelonella) — RC
myartsevae Tobias, 2001 — TUR

nachitshevanicus (Abdinbekova, 1971) (*Chelonus* [*Neochelonella*]) — DZ, A, SYR, TR, AZ
nartshukae Tobias, 1989 — DK, H, AsRu (Tu), MON
narynicus Tobias, 2003 — KI
nigellus Tobias, 1999 — E, D, CRO
nigricans Tobias, 1997 — UA (Cri)
nigricoxata (Sonan, 1932) (*Chelonella*) — RC
nigrimembris Tobias, 1992 —AsRu (Chit, Kam, Khab, Prim)
nigrinervis Tobias, 1990 — AsRu (Kam)
nigripalpalis Chen et Ji, 2002 — PEC (Hu)
nigripedator nom. n. — MON, AsRu (Kam)
= *nigripes* Tobias, 1996 nec Rao et Chalikwar, 1971
(*nigripes* Tobias, 1996) = *nigripedator* nom. n.
nigritibialis (Abdinbekova, 1971) (*Chelonus* [*Neochelonella*]) — TN, DZ, E, F, NL, H, BG, MOL, TR, SYR, JOR
nigritulus (Dahlbom, 1833) (*Chelonus*) — S, D, H, BG, EurRu (Kar), TR
nigritus Tobias, 1999 — E, FI, AsRu (AltMt)
nikolskajae Tobias, 2002 — TJ
(*nitens* [Reinhard, 1867] (*Chelonus*)) = *pellucens* (Nees, 1816)
(*nitobei* [Sonan, 1832] (*Chelonella*)) = *pectiniphorae* (Cushman, 1931)
nomas Tobias, 1997 — TUR, TJ, UZ

obliquis Ji et Chen, 2002 — PRC (Fu)
olgacola Tobias, 2000 — AsRu (Prim)
ononicus Tobias, 2000 — AsRu (Chit)
opaculus Tobias, 1989 — MON
opacus Tobias, 1989 — AsRu (Sib), MON
orenburgensis Tobias, 1997 — EurRu (Oren)
(*orientalis* [Silvestri, 1907] nec [Szépligeti, 1902] = *silvestrii* Papp, 1999
orotukanensis Tobias, 2000 — AsRu (Mag)
ovalis Tobias, 1984 — AsRu (Khab)
oviventris Tobias, 1989 — MON

(*palpalis* Tobias, 1989) = *hungaricus* Szépligeti, 1908
palpator Tobias, 1986 — AsRu (Prim)
pamiricus (Vojnovskaja–Kriger, 1931) — TJ, KIR
pappi Tobias, 1985 — F, ARM
paralunaris Tobias, 2000 — AsRu (Prim)
parcicornis (Herrich–Schaeffer, 1838) (*Chelonus*) — EUR, MON
= *rectus* Papp, 1971
= *thomsonii* (Dalla Torre, 1898)
parverticalis Tobias, 2000 — FI, AsRu (Prim, Sak)
paucifossa Papp, 1989 — KOR
pectiniphorae (Cushamn, 1931) — AsRu (Prim), MON, J, PRC
= *nitobei* (Sonan, 1932)

pectoralis (Tobias, 1976) (*Chelonus*) — AZ, MON
pedator (Dahlbom, 1833) (*Chelonus*) — Western PAL RE
= *secutor* (Marshall, 1885)
pellucens (Nees, 1816) — PAL RE
= *alboannulatus* (Szépligeti, 1896)
= *nitens* (Reinhard, 1867)
= *pulchricornis* (Szépligeti, 1898)
?= *varimaculatus* (Tobias, 1986)
pertrisis Tobias, 1996 — MON
pesenkoi Tobias, 2001 — KAZ
phalloniae (Telenga, 1941) — KAZ
pilicornis (Thomson, 1874) (*Chelonus*) — EUR
= *sculptilis* Tobias, 1986
pini Tobias, 2002 — NL, F, CZ, BG, GR, EurRu
plainifacis Chen et Ji, 2002 — PRC (Fu)
(*planicornis* Tobias, 1989) = *mongolicus* (Telenga, 1941)
plenus Papp, 1989 — KOR
polycolor Ji et Chen, 2002 — PRC (Fu, Yun)
(*probabilis* Sterzyski, 1997) = *cingulipes* (Niezabitowski, 1910)
przewalskii Tobias, 2001 — TR, KIR
pseudobasalis Tobias et Lozan, 2006 — CZ
puerilis Papp, 1989 — KOR
(*pulchricornis* [Szépligeti, 1898]) (*Chelonus*) = *pellucens* (Nees, 1816)
punctifossa bias, 2002 — EurRu (VolgObl)
punctiscutellaris Tobias, 2000 — AsRu (Khab, Prim)
pussiloides (Tobias, 1972) (*Chelonus* [*Microchelonus*]) — TUR, UZ, MON
pusillus (Szépligeti, 1908) (*Chelonus*) —PAL RE
?= *acuminatus* (Herrich–Schaeffer, 1838) sen. hom.?
= *tuberculiventris* Tobias, 1986
radialis (Tobias, 1966) (*Neochelonella*) — KOR
(*rasnitsyni* Tobias, 1992) = *elongatus* Papp, 1971
(*rectus* Papp, 1971) = *parcicornis* (Herrich–Schaeffer, 1838)
repeteki Tobias, 1996 — TUR
retrusus Tobias, 1989 — MON
retusus (Nees, 1816) — PAL RE
= *caudatus* (Thomson, 1874)
?= *emarginatus* (Herrich–Schaeffer, 1838)
?= *subemarginatus* (Herrich–Schaeffer, 1838)
rhagius (Zhang, Shi, He et Chen, 2008) (*Chelonus* [*Microchelonus*]) — PRC (Guangdong, Guangsi)
(*rimatus* [Szépligeti, 1896] (*Chelonus*) = *sulcatus* (Jurine, 1807)
(*rimulosus* [Thomson, 1874] (*Chelonus*) = *sulcatus* (Jurine, 1807)
ripaeus Tobias, 1986 — E, F, NL, DK, D, CRO, MAC, TR, EurAs (KolPen, Mur, Ur)
risorius (Reinhard, 1867) (*Chelonus*) — EUR, KAZ, KIR, MON
= *fissuralis* (Tobias, 1964)
= *fissus* (Szépligeti, 1900)
= *magnifissus* Tobias, 1986
rokkina (Sonan, 1932) (*Chelonella*) — RC
rondanus Tobias, 2008 — DZ, E, H, BG
rostratus (Tobias, 1966) (*Neochelonella*) — Western PAL RE
rotundifossa Tobias, 2000 — AsRu (Prim), J
rubens (Tobias, 1972) (*Chelonus* [*Microchelonus*]) — MON
rubriventris (Tobias, 1988) (*Chelonus*) — DK, H, RO, LT
rudolfae (Tobias, 1964) (*Neochelonella*) — KAZ
rufifossa Tobias, 1996 — MON
(*rufipedator* Tobias, 1990) = *latrunculus* (Marshall, 1885)

rufosignata (Sonan, 1932) (*Chelonella*) — RC
rugicollis (Thomson, 1874) (*Chelonus*) — PAL RE
= *irrepertus* Tobias, 1994, partim
= *temporalis* Tobias, 1986
rugilobus Tobias, 1986 — MOL
rugosinotum Tobias, 2000 — AsRu (Mag)
ruptor Tobias, 2000 — AsRu (Kam)

saksauli (Tobias, 1974) (*Chelonus*) — MON
scaberrimus Tobias, 1999 — D
scabrosus (Szépligeti, 1896) (*Chelonus*) — PAL RE
scrobiculatus Tobias, 1986 — BG, MOL, TR
(*sculptilis* Tobias, 1986) = *pilicornis* (Thomson, 1874)
sculptur Chen et Ji, 2002 — PRC (Fu)
(*secutor* [Marshall, 1885] (*Chelonus*) = *pedator* (Dahlbom, 1833)
semenovi Tobias, 1986 — BG, MAC, TR, EurRu (Kaz, Ur), AsRu (Prim)
semilissus Tobias, 1989 — MON
semilunaris Tobias, 2000 — AsRu (Khab)
septemdecimplex Tobias, 1986 — AsRu (Kam)
shestakovi Tobias, 1997 — TUR
silvestrii Papp, 1999 — I, IL, YAR, TN
= *orientalis* (Silvestri, 1907)
sinensis (Chen et Van Achterberg, 1997) — PRC
sinevi Tobias, 2000 — N, DK, AsRu (Prim)
sinuosus Ji et Chen, 2002 — PRC (Ji)
slovakiensis Tobias et Lozan, 2003 — SK
sochiensis Tobias, 1997 — EurRu (So)
sochiorum Tobias, 2005 — EurRu (So)
sordipalpis Tobias, 1994 — AsRu (Prim)
spasskensis Tobias, 2000 — AsRu (Prim)
spinulosus Papp, 2014 — E (Canary Islands)
starki (Telenga, 1941) (*Chelonus* [*Chelonella*]) — CZ, H, MOL, RU, KAZ, KIR
stenogaster Tobias, 1995a: 67 — AsRu (Prim)
(*stenogaster* Tobias, 1995b: 423) = *artoventris* Tobias, 1997
sternatus Tobias, 1995 — KAZ
?*striatiscuta* (Fahringer, 1934) (*Chelonus* [*Chelonella*]) — D, H
subabditus Tobias, 2000 — AsRu (Prim)
subabstrusus Tobias, 2000 — AsRu (Prim)
subagathis Tobias, 1995 —TUR
subamandus Tobias, 2000 — AsRu (Prim), J
subangustatus Tobias, 1994 — AsRu (Chit, Prim)
subarcuatilis Tobias, 1986 — E, BG, MOL, ARM, TR, KAZ, TUR, UZ
subbasalis Tobias, 2001 — TUR
subcapsulifer Tobias, 2000 — AsRu (Kur)
subcaudatus (Tobias, 1976) — H, GE
subcontractus (Abdinbekova, 1971) (*Chelonus* [*Neochelonella*]) — PAL RE
subelaeaphilus Tobias, 2001 — KAZ
subelegantulus Tobias, 1994 — AsRu (Prim)
?*subemarginatus* (Herrich–Schaeffer, 1838) (*Chelonus*) ?= *retusus* (Nees, 1816)
subfenestratus Tobias, 1984 — AsRu (Prim)
subflagellaris Tobias, 2000 — AsRu (Prim)
subgenalis Tobias, 1991 — TJ
subjustus Tobias, 2008 — E
submarginalis Tobias, 2000 — AsRu (AltMt, Prim), KAZ
subpedator Tobias, 2000 — NL, CZ, A, AsRu (Kur)

subpusillus Tobias, 1997 — RO, TR, IR, KAZ, TJ
subrimulosus Tobias, 2000 — AzRu (Prim)
subsulcatus (Herrich–Schaeffer, 1838) — D, S, H, MAC, TR
subtilistriatus Papp, 1971 — MON
subventosus Tobias, 2000 — AsRu (Prim)
subversatilis Tobias, 2005 — EurRu (Oren), AsRu (Tu)
subverticalis Tobias, 2000 — AsRu (Prim)
sugonjaevi Tobias, 1989 — MON
sulcatus (Jurine, 1807) (*Chelonus*) — PAL RE
= *curvisculcatus* (Szépligeti, 1896)
= *rimatus* (Szépligeti, 1896)
= *rimulosus* (Thomson, 1874)
swellinervis Chen et Ji, 2002 — PRC (Ji)

tabonus (Sonan, 1932) (*Chelonus*) — RC, J, KOR
= *yami* (Sonan, 1932)
tadzhicus Tobias, 2001 — TJ
tadzhikistanicus Tobias, 1997 — TJ
talitzkii Tobias, 1986 — H, BG, MAC, MOL, TR
talyshensis (Tobias, 1976) (*Chelonus*) — AZ
(*talyshicus* Tobias, 2003) ?= *budapesti* Tobias, 1999
tarbagataicus Tobias, 1997 — KAZ
tatricus Tobias, 1999 — PL
tauricola Tobias, 2001 — UA (Cri)
tauricus Tobias, 1990 — H, BG, UA (Cri), KAZ, AsRu (Tu)
tedzhenicus Tobias, 1997 — TUR
telengai (Abdinbekova, 1965) (*Neochelonella*) — ARM, AZ, IR
(*temporalis* Tobias, 1986) = *rugicollis* (Thomson, 1874)
temulentus Tobias, 1997 — MOL, AsRu (AltMt)
tengisi Tobias, 2003 — KAZ
tersakkanicus Tobias, 2001 — KAZ
testaceus Tobias, 2001 — TUR
(*thomsonii* [Dalla Torre] (*Chelonus*) = *parcicornis* (Herrich–Schaeffer, 1838)
tianchiensis Ji et Chen, 2002 — PRC (Hain)
tingutanus Tobias, 2002 — EurRu (Volgog)
tjanshanicus Tobias, 1995 — KIR
tobiasi (Zhang, Shi, He et Chen, 2008) (*Chelonus* [*Microchelonus*]) — PRC (Zhejiang)
tolii Tobias, 2000 — AsRu (Kur)
tosensis (Watanabe, 1937) (*Chelonus*) — J
transbaicalicus Tobias, 1992 — H, AsRu (Chit)
transversus Tobias, 1989 — AsRu (Chit), MON
(*tricolor* Tobias, 1976) = *gravenhorsti* (Nees, 1816)
tricoloratus Tobias, 1989 — AsRu (Prim)
tsagannuri Tobias, 2005 — EurRu (Kalm)
tshatkalicus Tobias, 2003 — SK, UZ
(*tuberculiventris* Tobias, 1986) = *pusillus* (Szépligeti, 1908)
tunetensis Tobias, 2001 — TN
turcicus Tobias, 2008 — GR, TR
turgidus Tobias, 1994 — CRO, AsRu (Chit), MON

ubsunuricus Tobias, 1996 — MON
uniformis Tobias, 1994 nec (Baker, 1926) sen. homonym — AsRu (Chit)
uralicus (Tobias, 1964) (Neochelonella) — EurRu (Ur)
uzbekistanicus Tobias, 2002 — UA, UZ

(*varimaculatus* [Tobias, 1986] (*Chelonus*)) ?= *pellucens* (Nees, 1816)
varus Tobias, 2000 — AsRu (Prim)
ventosus Tobias, 1989 — MON
verticalis Tobias, 1995 — DK, AsRu (Mag)
vescus (Kokujev, 1899) (*Chelonus*) — F, H, BG, AZ, TR, KAZ, AsRu (Sak)
= *minutus* (Szépligeti, 1898) nec (A. Costa, 1884)
vickae Lozan et Tobias, 2006 — CZ
victorovi Tobias, 1999 — D, EurRu (Volgog)
vitalii Tobias, 1997 — TUR
vitasi Tobias, 2000 — AsRu (Sak)
volgensis Tobias, 1986 — EurRu (VolgDe), PRC (Xinj)
volkovitshi Tobias, 1996 — TUR
vulcaniellae Tobias, 1990 — UA (Cri)

xanthofossa Tobias, 2000 — AsRu (Prim, Sak), J
xanthoscaposus Tobias, 2001 — SYR
xanthozona (Alexeev, 1971) — I, H, KAZ, TUR, UZ, MON
xenia Tobias, 2000 — H, MAC, GR, TR, AsRu (Prim), MON

(*yami* [Sonan, 1932] (Chelonella) = *tabonus* (Sonan, 1932)

zaitzevi (Tobias, 1972) (Chelonus) — DK, MON
zeravshanicus Tobias, 2003 — TJ, AsRu (Tu)
zorkuli Tobias, 1991 — TJ
zygophylli Tobias, 1996 — TUR

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The water and shore beetles (Coleoptera) of the Kis-Balaton

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LŐKKÖS, A: *The water and shore beetles (Coleoptera) of the Kis-Balaton.*
Abstract: During the faunistical exploration of Kis-Balaton carried out between 2008 and 2010, 97 water and shore beetle species were recorded (1 Sphaeriusidae, 8 Haliplidae, 35 Dytiscidae, 2 Noteridae, 1 Gyrinidae, 1 Spercheidae, 3 Hydrochidae, 1 Helophoridae, 30 Hydrophilidae, 2 Dryopidae, 5 Hydraenidae, 3 Heteroceridae and 5 Scirtidae taxon). 27 species are reported for the first time from the Kis-Balaton. Important faunistic records are the new localities of *Hydroporus scalesianus* Stephens, 1828, *H. umbrosus* (Gyllenhal, 1808), *Laccornis oblongus* (Stephens, 1835), *Ilybius guttiger* (Gyllenhal, 1818), *Cercyon bononiensis* Chiesa, 1964, *Dryops anglicanus* Edwards, 1909 and *Heterocerus obsoletus* Curtis 1828.

Keywords: aquatic macroinvertebrata, Sphaeriusidae, Haliplidae, Dytiscidae, Noteridae, Gyrinidae, Spercheidae, Helophoridae, Hydrochidae, Hydrophilidae, Hydraenidae, Dryopidae, Heteroceridae, Scirtidae, Hungary.

Introduction

Kis-Balaton is one of the best known wetland biotopes of Hungary and of great importance, but we have only little information of the water and shore beetles of this area. The first published data for this area was KONDOROSY et al. (1996) wich presented 51 water beetle species. The paper of CSABAI et al. (2001) listed 35 Adephaga species, including the first data of *Laccornis oblongus* (Stephens, 1835) for the country. POZSGAI (2005) summarized the data about the reed beetles (Donaciinae: Chrysomelidae). In a recent publication the aquatic macroinvertebrates of the Kis-Balaton were processed, and 35 water beetle species were reported (KISS et al. 2009). The Kis-Balaton was studied before the aboved mentioned researches especially. Zoltán Kaszab and Vilmos Székessy who's work deserves particular mention. The beetles they collected were stored in the Hungarian Natural History Museum Budapest, but most of them are still have not been published.

A total of 82 water beetle species are known from this area, based on published data. About the families Sphaeriusidae, Hydrochidae, Heteroceridae and Scirtidae we known no published data from the Kis-Balaton.

In this paper the results of a survey of the water and shore beetle families Sphaeriusidae, Haliplidae, Dytiscidae, Noteridae, Gyrinidae, Spercheidae, Helophoridae, Hydrochidae, Hydrophilidae Hydraenidae, Dryopidae, Heteroceridae and Scirtidae in the Kis-Balaton are summarized. So far, 335 species of these 14 families are known to occur in Hungary.

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The investigations were made in the Fenéki Lake (Kis-Balaton Water Management System Phase II.).

Material and methods

Beetles were captured by sweeping with a long-handled pond net just above the substrate, on water surface, and among the submerged or emergent vegetation. Beside netting a few specimens were captured by hand-searching on the surface and from the shore.

Frequently used method was collecting at light. For this I used a white sheet illuminated with a mercury-vapour bulb and a "black light" UV electron tube. For light trapping a portable acumulate light trap was used, the light was an 8 W white fluorescent lamp. The light trap was operated on four sites.

Besides this shore trampling, shore washing was used for capturing beetles, which have semiaquatic or terrestrial way of life.

The collected specimens were killed by ethyl-acetate, and conserved dry. Water and shore beetle specimens were identified on the basis of keys and descriptions by CSABAI (2000), CSABAI et al. (2002), DRECHSEL (1979), FREUDE (1971), HEBAUER (1989), JÄCH (1998), JÄCH & DELGADO (2008) KLAUSNITZER (2009) and LOHSE (1971).

H. minutus and *H. paraminutus* are common, often coexistent in Hungary. The exact separation of these two species is feasible only by chromosomal analyses, if we exclude the specimens with typical habitus. It is beyond our means to execute these kinds of analyses, therefore we discuss them as pair-species.

In Table 1 the administrative units are given with the sampling sites, the exact geographical co-ordinates (WGS84).

Results

During a faunistical investigation of Kis-Balaton carried out between 2008 and 2010 at 31 sites 97 water and shore beetle species (1 Sphaeriusidae, 8 Haliplidae, 35 Dytiscidae, 2 Noteridae, 1 Gyrinidae, 5 Hydraenidae, 1 Spercheidae, 3 Hydrochidae, 1 Helophoridae, 30 Hydrophilidae, 2 Dryopidae; és 5 Scirtidae species) were recorded from the area. About this, 27 species were new records for this area. From the family Sphaeriusidae, Hydrochidae, Heteroceridae and Scirtidae these are the first records for the Kis-Balaton. The most common species on light were *Enochrus coarctatus*, *Cercyon sternalis* and *Coelostoma orbiculare* (all family Hydrophilidae), in the samplings with water netting *Haliplus ruficollis* (Halpilidae), *Noterus crassicornis* (Noteridae), *Hygrotus inaequalis* and *Hydroporus angustatus* (Dytiscidae).

List of species

In the list of new records the administration unit of the locality is given, followed by name of the locality, date of sampling, total number of captured individuals and name of

Table 1: Sampling sites (the administrative units are given with the locality and the exact geographical co-ordinates (WGS84)) For the sampling sites, see Fig. 1.

No	Administrative unite	Locality	N	E
1	Balatonmagyaród	Almás-sziget, D-i áramlásjavító csatorna	46° 38' 16.94"	17° 12' 34.68"
2	Balatonmagyaród	Almás-sziget, É-i áramlásjavító csatorna 1.	46° 38' 53.36"	17° 12' 59.54"
3	Balatonmagyaród	Almás-sziget, É-i áramlásjavító csatorna 2.	46° 38' 52.28"	17° 12' 54.83"
4	Balatonmagyaród	Almás-sziget, kilátó	46° 38' 27.81"	17° 12' 33.65"
5	Balatonmagyaród	Hosszú-sziget south	46° 36' 25.76"	17° 12' 34.48"
6	Balatonmagyaród	Hosszú-sziget south 2.	46° 36' 27.25"	17° 12' 34.76"
7	Balatonmagyaród	Hosszú-sziget north	46° 37' 03.25"	17° 12' 35.46"
8	Balatonmagyaród	Hosszú-sziget north 2.	46° 37' 02.91"	17° 12' 33.87"
9	Balatonmagyaród	Simon-sziget	46° 38' 17.21"	17° 13' 29.42"
10	Balatonmagyaród	Zimányi-domb	46° 38' 17.23"	17° 11' 47.08"
11	Fonyed	Endes	46° 38' 11.51"	17° 14' 48.71"
12	Fonyed	Endes 2.	46° 37' 50.80"	17° 14' 39.81"
13	Keszthely	Barna-tó ÉK-i sarok	46° 41' 31.41"	17° 14' 13.77"
14	Keszthely	Diás-sziget	46° 40' 41.63"	17° 13' 48.01"
15	Keszthely	Diás-sziget, Zala folyó	46° 40' 39.02"	17° 13' 50.96"
16	Keszthely	Diás-sziget, Zala-folyó 2.	46° 36' 28.58"	17° 12' 34.62"
17	Keszthely	Egérút-csatorna	46° 41' 17.07"	17° 14' 12.60"
18	Sármellék	Déli-keresztcsatorna	46° 41' 21.19"	17° 12' 12.04"
19	Sármellék	Sikér, D-i oldal	46° 40' 54.29"	17° 11' 03.82"
20	Sármellék	Sikér, ÉK-i sarok	46° 41' 14.78"	17° 11' 40.54"
21	Sármellék	Sikér, ÉNy-i sarok	46° 41' 05.31"	17° 10' 58.40"
22	Vörs	Máriaasszony-sziget	46° 39' 35.97"	17° 14' 51.01"
23	Vörs	Máriaasszony-sziget	46° 39' 03.86"	17° 14' 54.91"
24	Vörs	Marót-völgyi-csatorna	46° 39' 15.78"	17° 14' 52.77"
25	Vörs	árok	46° 38' 09.64"	17° 14' 49.34"
26	Zalavár	1. sz. terelőtöltés végénél	46° 40' 44.79"	17° 12' 20.97"
27	Zalavár	Gurgulói-bukó	46° 39' 54.50"	17° 13' 12.24"
28	Zalavár	Gurgulói-bukónál, stég	46° 39' 54.50"	17° 13' 12.24"
29	Zalavár	Nagy-Gunyhó	46° 40' 07.17"	17° 12' 26.11"
30	Zalavár	Zala-áttöltés K	46° 39' 32.23"	17° 12' 30.98"
31	Zalavár	Zala-áttöltés Ny	46° 39' 33.58"	17° 12' 30.27"

the collector, when it is not the author. For the common species only the name of the locality and the administration unit were mentioned in the list.

In cases when the localities are more identifiable, in some geographical terms of the original Hungarian form were kept:, árok = ditch; áramlásjavító-csatorna, csatorna, keresztcsatorna = channel; áttöltés = fill; domb = rising, folyó = stream, sziget = isle, kilátó = belvedere, oldal = side sarok = nook, stég = pier.

Abbreviations: fcs = light trap; lp = on light; pm = shore floating.

Sphaeriusidae

Sphaerius acaroides Waltl, 1838 − Balatonmagyaród, Hosszú-sziget north, csatorna, 2010.04.29, 10, pm.

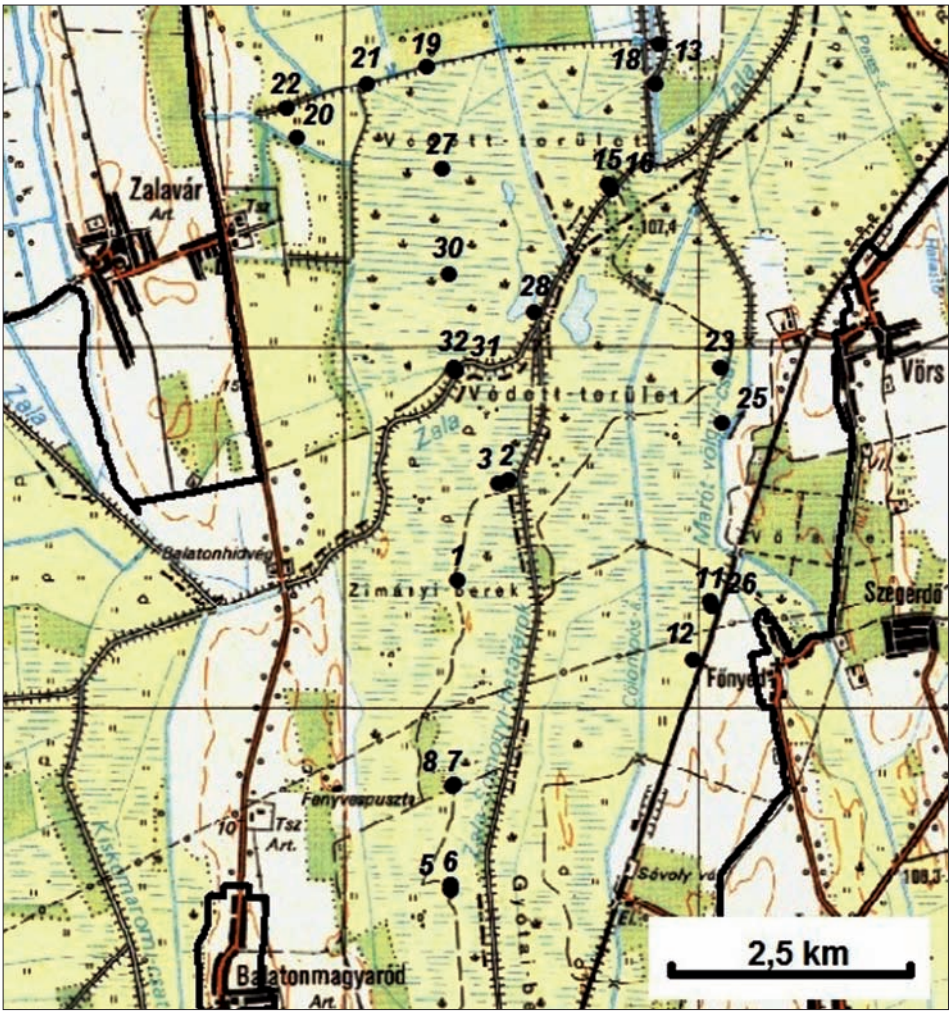

Fig. 1: Sampling sites at the Kis-Balaton Fenéki Lake
The black line represent the limit of the Balaton Uplands National Park

Haliplidae

Haliplus obliquus (Fabricius, 1787) − Vörs, árok, 2010.05.27, 3.

Haliplus fluviatilis Aubé, 1836 − Keszthely, Diás-sziget, 2010.08.11, 1, lp − Zalavár, Gurgulói-bukónál, stég, 2010.07.28, 2.

Haliplus furcatus Seidlitz, 1887 − Balatonmagyaród, Hosszú-sziget north, 2010.04.29, 2.

Haliplus heydeni Wehncke, 1875 − Zalavár, Gurgulói-bukónál, stég, 2010.07.28, 1.

Haliplus immaculatus Gerhardt, 1877 − Balatonmagyaród, Zimányi-domb, 2009.07.02., 2, fcs − Keszthely, Egérút-csatorna, 2009.09.03, 3.

Haliplus ruficollis (De Geer, 1774) − Balatonmagyaród, Almás-sziget, D-i áramlásjavító csatorna, 2009.09.21, 2; Almás-sziget, É-i áramlásjavító csatorna 2., 2009.09.21, 1; Hosszú-sziget south, 2010.04.29, 4; Hosszú-sziget north, csatorna, 2010.04.29, 1; Zimányi-domb, 2009.07.02., 1, fcs − Főnyed, Endes, 2010.05.27, 2; 2010.10.12, 8 − Keszthely,

Diás-sziget, 2009.09.03, 1; 2010.08.11, 1, lp; Diás-sziget, Zala-folyó, 2008.10.09, 1; 2009.09.03, 2; 2010.07.28, 1; Egérút-csatorna, 2009.09.03, 5 − Sármellék, Sikér, D-i oldal, 2010.04.10, 9; 2010.07.28, 7; ÉK-i sarok, 2009.09.07, 16; Sikér, ÉNy-i sarok, 2009.09.21, 5 − Vörs, Máriaasszony-sziget, 2010.10.12, 2; Marót-völgyi-csatorna, 2010.05.27, 7; árok, 2010.05.27, 6 −Zalavár, Gurgulói-bukó, 2010.07.28, 8; Gurgulói-bukónál, stég, 2010.07.28, 8; Nagy-Gunyhó, 2009.09.07, 6; Zala-áttöltés K, 2009.09.07, 11.

Haliplus variegatus Sturm, 1834 − Főnyed, Endes, 2010.10.12, 1 − Vörs, árok, 2010.05.27, 1.

Peltodytes caesus (Duftschmid, 1805) − Balatonmagyaród, Hosszú-sziget south, 2010.04.29, 2 − Sármellék, Sikér, ÉK-i sarok, 2009.09.07, 3 − Zalavár, Gurgulói-bukónál, stég, 2010.07.28, 1.

Dytiscidae

Liopterus haemorrhoidalis (Fabricius, 1787) − Balatonmagyaród, Almás-sziget, D-i áramlásjavító csatorna, 2009.09.21, 1 − Főnyed, Endes, 2010.05.27, 1 − Vörs, Máriaasszony-sziget, 2010.05.27, 2.

Bidessus nasutus Sharp, 1887 − Keszthely, Barna-tó, ÉK-i sarok, 2009.09.07, 1.

Hydroglyphus geminus (Fabricius, 1792) − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 11, lp; Hosszú-sziget north, csatorna, 2010.04.29, 1; Zimányi-domb, 2009.07.02., 3, fcs − Főnyed, Endes, 2010.10.12, 15; 2010.10.12, 4 – Keszthely, Diás-sziget, 2010.07.28, 4; 2010.08.11, 6, lp; − Sármellék, Sikér, ÉK-i sarok, 2009.09.07, 3; Sikér, D-i oldal, 2010.04.10, 4; 2010.07.28, 1− Vörs, Máriaasszony-sziget, 2010.10.12, 5; 2009.07.03., 3, fcs; árok, 2010.05.27, 1 − Zalavár, Gurgulói-bukó, 2010.07.28, 2;.

Graptodytes granularis (Linnaeus, 1767) − Balatonmagyaród, Almás-sziget, É-i áramlásjavító csatorna 1., 2009.09.21, 1; Balatonmagyaród, Hosszú-sziget south, 2010.04.29, 1 − Főnyed, Endes, 2010.05.27, 1; 2010.10.12, 2 − Keszthely, Diás-sziget, 2010.07.28, 1 − Vörs, Máriaasszony-sziget, 2010.05.27, 3; 2010.10.12, 7.

Graptodytes pictus (Fabricius, 1787) − Keszthely, Diás-sziget, 2009.09.03, 1; Diás-sziget, Zala-folyó, 2009.09.03, 1− Vörs, árok, 2010.05.27, 2 − Zalavár, Gurgulói-bukó, 2010.07.28, 1.

Hydroporus angustatus Sturm, 1835 − Balatonmagyaród, Almás-sziget, D-i áramlásjavító csatorna, 2010.04.29, 2; Almás-sziget, kilátó, 2010.07.13, 1, lp; Zimányi-domb, 2009.07.02., 2, fcs − Keszthely, Barna-tó ÉK-i sarok, 2009.09.07, 5; Diás-sziget, 2008.10.05, 1; 2009.09.03, 1; 2010.07.28, 3; Diás-sziget, Zala-folyó, 2009.09.03, 2; 2010.07.28, 3; Egérút-csatorna, 2009.09.03, 1 − Sármellék, Sikér, D-i oldal, 2010.04.10, 3; 2010.07.28, 1; Sikér, ÉK-i sarok, 2009.09.07, 2 − Vörs, Máriaasszony-sziget, 2010.05.27, 16; 2010.10.12, 8.

Hydroporus fuscipennis Schaum, 1868 − Keszthely, Barna-tó ÉK-i sarok, 2009.09.07, 2 − Sármellék, Sikér, D-i oldal, 2010.04.10, 1− Vörs, Máriaasszony-sziget, 2010.05.27, 1.

Hydroporus palustris (Linnaeus, 1761) − Főnyed, Endes, 2010.10.12, 1 − Keszthely, Diás-sziget, 2008.10.05, 1; 2009.09.03, 6; 2010.07.28, 3; Diás-sziget, Zala-folyó, 2009.09.03, 7; 2010.07.28, 1 − Vörs, Máriaasszony-sziget, 2010.05.27, 2; árok, 2010.05.27, 1 –Zalavár, Gurgulói-bukó, 2010.07.28, 2; Zala-áttöltés K, 2009.09.07, 1.

Hydroporus scalesianus Stephens, 1828 − Balatonmagyaród, Almás-sziget, D-i áramlásjavító csatorna, 2009.09.21, 1; 2010.04.29, 2; Hosszú-sziget north, 2010.04.29, 6 − Főnyed, Endes, 2010.05.27, 3; 2010.10.12, 1 − Vörs, Máriaasszony-sziget, 2010.05.27, 14; 2010.10.12, 13.

Hydroporus striola (Gyllenhal, 1826) − Főnyed, Endes, 2010.05.27, 3; 2010.10.12, 1 − Keszthely, Barna-tó ÉK-i sarok, 2009.09.07, 12; Keszthely, Egérút-csatorna, 2009.09.03, 3 − Vörs, Máriaasszony-sziget, 2010.10.12, 9; árok, 2010.05.27, 1.

Hydroporus umbrosus (Gyllenhal, 1808) − Vörs, Máriaasszony-sziget, 2010.05.27, 1; 2010.10.12, 1.

Porhydrus lineatus (Fabricius, 1775) − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 1, lp; Hosszú-sziget north, 2010.04.29, 1 − Keszthely, Egérút-csatorna, 2009.09.03, 2 − Sármellék, Sikér, D-i oldal, 2010.04.10, 2; Sikér, ÉK-i sarok, 2009.09.07, 6; Sikér, ÉNy-i sarok, 2009.09.21, 1 − Vörs, Máriaasszony-sziget, 2010.10.12, 2; árok, 2010.05.27, 1.

Suphrodytes dorsalis (Fabricius, 1787) − Balatonmagyaród, Almás-sziget, D-i áramlásjavító csatorna, 2009.09.21, 1; Hosszú-sziget north, 2010.04.29, 2.

Hydrovatus cuspidatus (Kunze, 1818) − Balatonmagyaród, Hosszú-sziget south, 2010.04.29, 1; Hosszú-sziget north, csatorna, 2010.04.29, 2 − Főnyed, Endes, 2010.05.27, 2 − Keszthely, Diás-sziget, 2010.08.11, 1, lp − Vörs, Máriaasszony-sziget, 2010.05.27, 2; árok, 2010.05.27, 2.

Hygrotus decoratus (Gyllenhal, 1808) − Balatonmagyaród, Almás-sziget, D-i áramlásjavító csatorna, 2009.09.21, 1; 2010.04.29, 1; Almás-sziget, É-i áramlásjavító csatorna 1., 2009.09.21, 1; Hosszú-sziget south, 2010.04.29, 2; 2010.04.29, 1; Hosszú-sziget north, 2010.04.29, 1; 2010.04.29, 1 − Főnyed, Endes, 2010.05.27, 5; 2010.10.12, 2 − Keszthely, Barna-tó ÉK-i sarok, 2009.09.07, 4; Diás-sziget, 2009.09.03, 1; 2010.07.28, 3; Diás-sziget, Zala-folyó, 2009.09.03, 1; 2010.07.28, 1; Egérút-csatorna, 2009.09.03, 2 − Sármellék, Sikér, D-i oldal, 2010.07.28, 2 − Vörs, Máriaasszony-sziget, 2010.05.27, 5; 2010.10.12, 13; Marót-völgyi-csatorna, 2010.05.27, 1; árok, 2010.05.27, 1 − Zalavár, Gurgulói-bukónál, stég, 2010.07.28, 1.

Hygrotus impressopunctatus (Schaller, 1783) − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 1, lp − Főnyed, Endes, 2010.10.12, 1; 2010.10.12, 2 − Keszthely, Diás-sziget, 2010.08.11, 1, lp − Sármellék, Sikér, ÉK-i sarok, 2009.09.07, 1 − Vörs, Máriaasszony-sziget, 2010.05.27, 3; 2010.10.12, 1.

Hygrotus inaequalis (Fabricius, 1776) − Balatonmagyaród, Almás-sziget, D-i áramlásjavító csatorna, 2009.09.21, 1; Almás-sziget, É-i áramlásjavító csatorna 2., 2009.09.21, 2; Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 1, lp; Hosszú-sziget south, 2010.04.29, 1; Hosszú-sziget north, 2010.04.29, 1 − Főnyed, Endes, 2010.05.27, 1; 2010.10.12, 2 − Keszthely, Diás-sziget, 2009.09.03, 1; 2010.07.28, 5; Diás-sziget, Zala-folyó, 2009.09.03, 1 − Sármellék, Sikér, D-i oldal, 2009.09.03, 1; 2010.04.10, 2; Sikér, ÉK-i sarok, 2009.09.07, 3; Vörs, Máriaasszony-sziget, 2010.05.27, 1; 2010.10.12, 3; 2009.07.03.,4, fcs; árok, 2010.05.27, 2 − Zalavár, Gurgulói-bukó, 2009.09.03, 2; 2010.07.28, 3; Gurgulói-bukónál, stég, 2010.07.28, 2.

Hyphydrus ovatus (Linnaeus, 1761) − Balatonmagyaród, Almás-sziget, D-i áramlásjavító csatorna, 2009.09.21, 5; 2010.04.29, 1; Almás-sziget, É-i áramlásjavító csatorna 2., 2009.09.21, 2; Hosszú-sziget north, 2010.04.29, 1 − Főnyed, Endes, 2010.05.27, 1 − Keszthely, Diás-sziget, 2010.07.28, 1; Diás-sziget, Zala-folyó, 2008.10.09, 3; 2010.07.28, 2; Egérút-csatorna, 2009.09.03, 2 − Sármellék, Sikér, D-i oldal, 2010.04.10, 3; 2010.07.28, 2 − Vörs, Máriaasszony-sziget, 2010.10.12, 7; Marót-völgyi-csatorna, 2010.05.27, 1; árok, 2010.05.27, 4 − Zalavár, Gurgulói-bukó, 2010.07.28, 1; Gurgulói-bukónál, stég, 2010.07.28, 1; Zala-áttöltés K, 2009.09.07, 11.

Laccornis oblongus (Stephens, 1835) − Balatonmagyaród, Hosszú-sziget north, 2010.04.29, 1.

Laccophilus hyalinus (De Geer, 1774) − Keszthely, Diás-sziget, Zala folyó, 2010.07.28, 1.

Laccophius minutus (Linnaeus, 1758) − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 2, lp − Főnyed, Endes, 2010.10.12, 1 − Vörs, Máriaasszony-sziget, 2010.10.12, 7.

Laccophius poecilus Klug, 1834 − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 4; Hosszú-sziget south, 2010.04.29, 2 − Főnyed, Endes, 2010.05.27, 1; 2010.10.12, 2 − Keszthely, Barna-tó ÉK-i sarok, 2009.09.07, 4; Diás-sziget, 2010.08.11, 3, lp − Sármellék, Sikér, D-i oldal, 2009.09.03, 1; 2010.04.10, 1; Sikér, ÉNy-i sarok, 2009.09.21, 1 − Vörs, Máriaasszony-sziget, 2010.10.12, 3; Marót-völgyi-csatorna, 2010.05.27, 1.

Agabus bipustulatus (Linnaeus, 1767) − Sármellék, Sikér, D-i oldal, 2010.07.28, 1.

Agabus undulatus (Schrank, 1776) − Keszthely, Diás-sziget, 2010.07.28, 1; Egérút-csatorna, 2009.09.03, 5 − Sármellék, Sikér, D-i oldal, 2010.04.10, 1; 2010.07.28, 2 − Vörs, Máriaasszony-sziget, 2010.10.12, 1.

Ilybius fenestratus (Fabricius, 1781) − Balatonmagyaród, Hosszú-sziget south, 2010.04.29, 1 − Keszthely, Diás-sziget, 2010.07.28, 1; Egérút-csatorna, 2009.09.03, 1 − Sármellék, Sikér, D-i oldal, 2009.09.03, 2 − Zalavár, Gurgulói-bukónál, stég, 2010.07.28, 2.

Ilybius guttiger (Gyllenhal, 1818) − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 4, lp − Keszthely, Diás-sziget, 2010.08.11, 4, lp − Vörs, Máriaasszony-sziget, 2010. 10.12, 1♂.

Ilybius quadriguttatus (Lacordaire, 1835) − Balatonmagyaród, Almás-sziget, É-i áramlásjavító csatorna 2., 2009.09.21, 1; Almás-sziget, kilátó, 2010.07.13, 5, lp; Simon-sziget, 2009.07.01, 5, fcs; Zimányi-domb, 2009.07.02., 1, fcs − Főnyed, Endes, 2010.05.27, 4 − Keszthely, Diás-sziget, 2009.09.03, 1; 2010.08.11, 10, lp; Diás-sziget, Zala folyó, 2010.07.28, 3 − Keszthely, Egérút-csatorna, 2009.09.03, 1 − Sármellék, Sikér, D-i oldal, 2010.07.28, 1 − Vörs, Máriaasszony-sziget, 2010.10.12, 1; Marót-völgyi-csatorna, 2010.05.27, 2; árok, 2010.05.27, 1.

Rhantus suturalis (MacLeay, 1825) − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 1, lp − Főnyed, Endes, 2010.10.12, 2 − Keszthely, Diás-sziget, 2010.08.11, 2, lp − Sármellék, Sikér, D-i oldal, 2010.04.10, 2; 2010.07.28, 6 − Zalavár, Gurgulói-bukó, 2010.07.28, 1; Zala-áttöltés K, 2009.09.07, 1.

Rhantus grapii (Gyllenhal, 1808) − Balatonmagyaród, Almás-sziget, É-i áramlásjavító csatorna 2., 2009.09.21, 1 − Keszthely, Barna-tó ÉK-i sarok, 2009.09.07, 1; Diás-sziget, 2008.10.05, 1; 2009.09.03, 1 − Sármellék, Sikér, D-i oldal, 2010.04.10, 1; 2010.07.28, 1.

Acilius sulcatus (Linnaeus, 1758) − Keszthely, Diás-sziget, Zala folyó, 2010.07.28, 1.

Graphoderus austriacus (Sturm, 1834) − Sármellék, Sikér, D-i oldal, 2010.07.28, 4.

Graphoderus cinereus (Linnaeus, 1758) − Keszthely, Diás-sziget, Zala folyó, 2010.07.28, 1; Gurgulói-bukó, 2009.09.03, 1; 2010.07.28, 1.

Dytiscus dimidiatus Bergsträsser, 1778 − Zalavár, Gurgulói-bukó, 2009.09.03, 1.

Hydaticus seminiger (De Geer, 1774) − Balatonmagyaród, Almás-sziget, D-i áramlásjavító csatorna, 2009.09.21, 1 − Almás-sziget, É-i áramlásjavító csatorna, 1., 2009.09.21, 1; Almás-sziget, É-i áramlásjavító csatorna 2., 2009.09.21, 1; Hosszú-sziget south, 2010.04.29, 1; Hosszú-sziget north, 2010.04.29, 1 − Főnyed, Endes, 2010.05.27, 1; 2010.10.12, 1 − Keszthely, Diás-sziget, 2008.10.05, 1; Egérút-csatorna, 2009.09.03, 2 − Zalavár, Gurgulói-bukó, 2010.07.28, 1.

Hydaticus transversalis (Pontoppidan, 1763) − Balatonmagyaród, Almás-sziget, É-i áramlásjavító csatorna 1., 2009.09.21, 1 − Főnyed, Endes, 2010.10.12, 1 − Vörs, Marót-völgyi-csatorna, 2010.05.27, 1.

Noteridae

Noterus clavicornis (De Geer, 1774) − Sármellék, Sikér, D-i oldal, 2009.09.03, 1 − Zalavár, 1. sz. terelőtöltés vége, 2009.09.07, 2.

Noterus crassicornis (O.F.Müller, 1776) − Balatonmagyaród, Almás-sziget, D-i áramlásjavító csatorna, 2009.09.21, 1; 2010.04.29, 2; Almás-sziget, É-i áramlásjavító csatorna

2., 2009.09.21, 1; Hosszú-sziget south, 2010.04.29, 1; Hosszú-sziget north, 2010.04.29, 1; Hosszú-sziget north, csatorna, 2010.04.29, 2 − Főnyed, Endes, 2010.05.27, 3; 2010.10.12, 4 − Keszthely, Barna-tó ÉK-i sarok, 2009.09.07, 5; Diás-sziget, 2008.10.05, 1; 2010.07.28, 5; Diás-sziget, Zala-folyó, 2009.09.03, 7; 2010.07.28, 2; Egérút-csatorna, 2009.09.03, 6 − Sármellék, Sikér, D-i oldal, 2010.04.10, 5; 2010.07.28, 3; Sikér, ÉK-i sarok, 2009.09.07, 6 − Vörs, Marót-völgyi-csatorna, 2010.05.27, 2 − Vörs, árok, 2010.05.27, 4 − Zalavár, 1. sz. terelőtöltés vége, 2009.09.07, 1; Gurgulói-bukó, 2010.07.28, 1; Gurgulói-bukónál, stég, 2010.07.28, 2; Zala-áttöltés K, 2009.09.07, 1.

Gyrinidae

Gyrinus substriatus Stephens, 1829 − Keszthely, Diás-sziget, 2010.08.11, 1♀, lp − Zalavár, Gurgulói-bukó, 2010.07.28, 1.

Helophoridae

Helophorus minutus Fabricius, 1775/ *paraminutus* Angus, 1986 − Balatonmagyaród, Simon-sziget, 2009.07.01, 3♀, fcs; Zimányi-domb, 2009.07.02., 3 ♀, fcs.

Hydrochidae

Hydrochus crenatus (Fabricius, 1792) − Balatonmagyaród, Almás-sziget, D-i áramlás-javító csatorna, 2009.09.21, 5; 2010.04.29, 3; Almás-sziget, kilátó, 2010.07.13, 4, lp; Hosszú-sziget south, 2010.04.29, 6; Hosszú-sziget north, 2010.04.29, 3; Hosszú-sziget north, csatorna, 2010.04.29, 2 − Főnyed, Endes, 2010.05.27, 1; 2010.10.12, 3 − Sármellék, Sikér, D-i oldal, 2010.04.10, 1 − Vörs, Máriaasszony-sziget, 2010.05.27, 5; 2009.07.03.,1, fcs; Marót-völgyi-csatorna, 2010.05.27, 4 − Zalavár, Gurgulói-bukó, 2010.07.28, 1.

Hydrochus elongatus (Schaller, 1783) − Balatonmagyaród, Almás-sziget, D-i áramlás-javító csatorna, 2009.09.21, 2; Almás-sziget, kilátó, 2010.07.13, 1, lp.

Hydrochus megaphallus Berge Henegouwen, 1988 − Balatonmagyaród, Hosszú-sziget north, 2010.04.29, 2 − Keszthely, Diás-sziget, Zala folyó, 2010.07.28, 1 − Vörs, Máriaasszony-sziget, 2010.05.27, 11.

Spercheidae

Spercheus emarginatus (Schaller, 1783) − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 8, lp; Hosszú-sziget south, 2010.04.29, 1 − Keszthely, Diás-sziget, 2010.08.11, 1 − Sármellék, Sikér, D-i oldal, 2010.04.10, 1 − Vörs, Máriaasszony-sziget, 2010.10.12, 1 − Zalavár, 1. sz. terelőtöltés vége, 2009.09.07, 2; Gurgulói-bukó, 2010.07.28, 1.

Hydrophilidae

Coelostoma orbiculare (Fabricius, 1775) − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 8, lp; Balatonmagyaród, Hosszú-sziget south, 2010.04.29, 1; Hosszú-sziget north, 2010.04.29, 1; Hosszú-sziget north, csatorna, 2010.04.29, 1; Simon-sziget, 2009.07.01, 57, fcs; Zimányi-domb, 2009.07.02., 174, fcs − Főnyed, Endes, 2010.05.27, 1 − Keszthely, Egérút-csatorna, 2009.09.03, 2 − Sármellék, Sikér, ÉNy-i sarok, 2009.09.21, 1 − Vörs, Marót-völgyi-csatorna, 2010.05.27, 1 − Zalavár, 1. sz. terelőtöltés vége, 2009.09.07, 2; Zala-áttöltés Ny, 2009.09.07, 3

Cercyon convexiusculus Stephens, 1792 − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 5, lp.

Cercyon bononiensis Chiesa, 1964 − Balatonmagyaród, Hosszú-sziget north, 2010.04.29, 2; Simon-sziget, 2009.07.01, 1.

Cercyon lateralis (Marsham, 1802) − Balatonmagyaród, Zimányi-domb, 2009.07.02., 1, fcs.

Cercyon marinus Thomson, 1853 − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 19, lp; Simon-sziget, 2009.07.01, 1, fcs − Keszthely, Diás-sziget, 2010.08.11, 20, lp − Vörs, Máriaasszony-sziget, 2009.07.03., 3, fcs.

Cercyon sternalis Sharp, 1918 − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 77, lp; Hosszú-sziget south, 2010.04.29, 2; Hosszú-sziget north, 2010.04.29, 7; Simon-sziget, 2009.07.01, 150, fcs; Zimányi-domb, 2009.07.02., 500, fcs − Keszthely, Diás-sziget, 2009.07.04., 15, fcs; 2010.08.11, 19, lp; Diás-sziget, Zala folyó, 2010.07.28, 1; Egérút-csatorna, 2009.09.03, 1 − Sármellék, Sikér, D-i oldal, 2010.04.10, 1; Sikér, ÉK-i sarok, 2009.09.07, 1; Sikér, ÉNy-i sarok, 2009.09.21, 1 − Vörs, Máriaasszony-sziget, 2009.07.03., 1, fcs − Zalavár, 1. sz. terelőtöltés vége, 2009.09.07, 1; Zala-áttöltés Ny, 2009.09.07, 6.

Cercyon unipunctatus (Linnaeus, 1758) − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 2, lp.

Cercyon ustulatus (Preyssler, 1790) − Balatonmagyaród, Hosszú-sziget north, csatorna, 2010.04.29, 1, pm.

Cercyon analis (Paykull, 1798) − Keszthely, Diás-sziget, 2010.08.11, 1, lp.

Cercyon laminatus Sharp, 1873 − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 3, lp; Simon-sziget, 2009.07.01, 1, fcs.

Cryptopleurum subtile Sharp, 1884 − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 1, lp.

Anacaena limbata (Fabricius, 1792) − Balatonmagyaród, Almás-sziget, D-i áramlásjavító csatorna, 2010.04.29, 1; Almás-sziget, kilátó, 2010.07.13, 6, lp; Hosszú-sziget south, 2010.04.29, 1; Hosszú-sziget north, 2010.04.29, 1; Hosszú-sziget north, csatorna, 2010.04.29, 1; Zimányi-domb, 2009.07.02., 33, fcs − Főnyed, Endes, 2010.05.27, 1 − Keszthely, Diás-sziget, 2009.09.03, 1; 2010.07.28, 1; Diás-sziget, Zala-folyó, 2009.09.03, 2; Egérút-csatorna, 2009.09.03, 2 − Sármellék, Sikér, D-i oldal, 2010.04.10, 1; 2010.07.28, 2; Sikér, ÉK-i sarok, 2009.09.07, 7; Sikér, ÉNy-i sarok, 2009.09.21, 4 − Vörs, Máriaasszony-sziget, 2010.05.27, 4; 2010.10.12, 2; 2009.07.03., 1, fcs; Marót-völgyi-csatorna, 2010.05.27, 1; árok, 2010.05.27, 2 − Zalavár, 1. sz. terelőtöltés vége, 2009.09.07, 1.

Laccobius bipunctatus (Fabricius, 1775) − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 1♀, lp.

Laccobius minutus (Linnaeus, 1758) − Főnyed, Endes, 2010.10.12, 1♀.

Cymbiodyta marginella (Fabricius, 1792) − Balatonmagyaród, Almás-sziget, D-i áramlásjavító csatorna, 2010.04.29, 1; Almás-sziget, kilátó, 2010.07.13, 13, lp; Hosszú-sziget south, 2010.04.29, 1; Hosszú-sziget north, 2010.04.29, 1; Simon-sziget, 2009.07.01, 47, fcs; Zimányi-domb, 2009.07.02., 80, fcs − Keszthely, Diás-sziget, 2010.08.11, 2, lp − Sármellék, Sikér, D-i oldal, 2010.04.10, 1; Sikér ÉK-i sarok, 2009.09.07, 1; Sikér, ÉNy-i sarok, 2009.09.21, 1 − Vörs, Máriaasszony-sziget, 2010.05.27, 1; árok, 2010.05.27, 1 − Zalavár, Gurgulói-bukó, 2010.07.28, 1.

Enochrus bicolor (Fabricius, 1792) − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 15, lp; Simon-sziget, 2009.07.01, 23, fcs; Zimányi-domb, 2009.07.02., 8, fcs.

Enochrus melanocephalus (Olivier, 1792) − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 4, lp; Hosszú-sziget north, csatorna, 2010.04.29, 1; Simon-sziget, 2009.07.01, 4, fcs; Zimányi-domb, 2009.07.02., 5, fcs − Főnyed, Endes, 2010.05.27, 4.

Enochrus ochropterus (Marsham, 1802) − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 4, lp; Simon-sziget, 2009.07.01, 1, fcs; Zimányi-domb, 2009.07.02., 6, fcs − Vörs, Marót-völgyi-csatorna, 2010.05.27, 2 − Zalavár, Zala-áttöltés K, 2009.09.07, 1.

Enochrus quadripunctatus (Herbst, 1797) − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 15, lp; Simon-sziget, 2009.07.01, 5, fcs; Zimányi-domb, 2009.07.02., 1, fcs − Vörs, Máriaasszony-sziget, 2009.07.03., 1, fcs.

Enochrus testaceus (Fabricius, 1801) − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 36, lp; Hosszú-sziget north, 2010.04.29, 2; Simon-sziget, 2009.07.01, 44, fcs; Zimányi-domb, 2009.07.02., 62, fcs − Főnyed, Endes, 2010.05.27, 1 − Keszthely, Diás-sziget, 2010.08.11, 4, lp; Egérút-csatorna, 2009.09.03, 2 − Sármellék, Sikér, D-i oldal, 2010.04.10, 1 − Vörs, árok, 2010.05.27, 1.

Enochrus coarctatus (Gredler, 1863) − Balatonmagyaród, Almás-sziget, D-i áramlásjavító csatorna, 2010.04.29, 1; Almás-sziget, É-i áramlásjavító csatorna 1., 2009.09.21, 1; Almás-sziget, kilátó, 2010.07.13, 28, lp; Hosszú-sziget south, 2010.04.29, 1; Hosszú-sziget north, csatorna, 2010.04.29, 1; Simon-sziget, 2009.07.01, 250, fcs; Zimányi-domb, 2009.07.02., 1000, fcs − Főnyed, Endes, 2010.05.27, 1 − Keszthely, Barna-tó ÉK-i sarok, 2009.09.07, 2; Diás-sziget, 2009.07.04., 6, fcs; 2009.09.03, 1; 2010.07.28, 2; 2010.08.11, 14, lp; Diás-sziget, Zala folyó, 2010.07.28, 1; Egérút-csatorna, 2009.09.03, 1 – Sármellék, Sikér, D-i oldal, 2010.04.10, 3 − Vörs, Máriaasszony-sziget, 2010.05.27, 1; 2009.07.03., 1, fcs; árok, 2010.05.27, 2 − Zalavár, 1. sz. terelőtöltés vége, 2009.09.07, 1; Gurgulói-bukónál, stég, 2010.07.28, 2; Zala-áttöltés K, 2009.09.07, 1.

Helochares obscurus (O.F.Müller, 1776) − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 4, lp; Hosszú-sziget south, 2010.04.29, 1; Hosszú-sziget north, csatorna, 2010.04.29, 2; Simon-sziget, 2009.07.01, 1, fcs − Főnyed, Endes, 2010.10.12, 1 − Keszthely, Diás-sziget, 2010.07.28, 1; 2010.08.11, 2, lp.

Hydrobius fuscipes (Linnaeus, 1758) − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 2, lp; Simon-sziget, 2009.07.01, 7, fcs; Zimányi-domb, 2009.07.02., 21, fcs − Keszthely, Diás-sziget, 2010.08.11, 2, lp − Sármellék, Sikér, D-i oldal, 2010.07.28, 1 − Zalavár, Gurgulói-bukónál, stég, 2010.07.28, 1.

Hydrochara caraboides (Linnaeus, 1758) − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 1, lp − Sármellék, Sikér, D-i oldal, 2010.07.28, 2 − Vörs, Máriaasszony-sziget, 2010.05.27, 1 − Zalavár, Gurgulói-bukónál, stég, 2010.07.28, 1.

Hydrochara flavipes (Steven, 1808) − Keszthely, Diás-sziget, 2010.08.11, 1, lp.

Hydrophilus aterrimus Eschscholtz, 1822 − Balatonmagyaród, Simon-sziget, 2009.07.01, 1, fcs; Zimányi-domb, 2009.07.01, 1, fcs − Vörs, Marót-völgyi-csatorna, 2010.05.27, 1.

Limnoxenus niger Zschach, 1788 − Keszthely, Barna-tó ÉK-i sarok, 2009.09.07, 1 − Sármellék, Sikér, ÉK-i sarok, 2009.09.07, 1 − Zalavár, Gurgulói-bukónál, stég, 2010.07.28, 1.

Chaetarthria seminulum (Herbst, 1797) − Balatonmagyaród, Hosszú-sziget north, csatorna, 2010.04.29, 5, pm.

Berosus frontifoveatus Kuwert, 1888 − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 14, lp; Simon-sziget, 2009.07.01, 3, fcs; Zimányi-domb, 2009.07.02., 6, fcs − Főnyed, Endes, 2010.10.12, 2 − Vörs, Máriaasszony-sziget, 2009.07.03., 1, fcs.

Berosus spinosus (Steven, 1808) − Keszthely, Diás-sziget, 2010.08.11, 1, lp.

Hydraenidae

Hydraena palustris Erichson, 1837 − Balatonmagyaród, Almás-sziget, D-i áramlásjavító csatorna, 2009.09.21, 10; 2010.04.29, 2; Almás-sziget, É-i áramlásjavító csatorna 2., 2009.09.21, 1; Hosszú-sziget south, 2010.04.29, 3; Hosszú-sziget north, 2010.04.29, 9; Hosszú-sziget north, csatorna, 2010.04.29, 3 − Főnyed, Endes, 2010.05.27, 1 − Keszthely, Diás-sziget, 2010.07.28, 1 − Sármellék, Sikér, D-i oldal, 2010.04.10, 3 − Vörs, Máriaasszony-sziget, 2010.05.27, 4; árok, 2010.05.27, 1.

Limnebius aluta Bedel, 1881 − Balatonmagyaród, Almás-sziget, D-i áramlásjavító csatorna, 2009.09.21, 8; 2010.04.29, 5; Hosszú-sziget south, 2010.04.29, 2; Hosszú-sziget north, 2010.04.29, 6 − Főnyed, Endes, 2010.05.27, 1; 2010.10.12, 1 − Keszthely, Diás-sziget, Zala-folyó, 2009.09.03, 2 − Vörs, Máriaasszony-sziget, 2010.10.12, 5 − Zalavár, 1. sz. terelőtöltés vége, 2009.09.07, 1; Nagy-Gunyhó, 2009.09.07, 1.

Limnebius atomus (Duftschmid, 1805) − Balatonmagyaród, Hosszú-sziget south, 2010.04.29, 4; Hosszú-sziget north, 2010.04.29, 4; Zimányi-domb, 2009.07.01, 6, fcs − Főnyed, Endes, 2010.05.27, 1; 2010.10.12, 2 − Keszthely, Diás-sziget, Zala-folyó, 2009.09.03, 2 − Sármellék, Sikér, D-i oldal, 2010.04.10, 6 − Vörs, Máriaasszony-sziget, 2010.05.27, 4; árok, 2010.05.27, 4 − Zalavár, Gurgulói-bukónál, stég, 2010.07.28, 1.

Ochthebius bernhardi Jäch & Delgado, 2008 − Vörs, Marót-völgyi-csatorna, 2010.05.27, 1♂.

Ochthebius minimus (Fabricius, 1792) − Zalavár, Zala-áttöltés K, 2009.09.07, 3.

Ochthebius minimus complex − Balatonmagyaród, Almás-sziget, D-i áramlásjavító csatorna, 2009.09.21, 1♀ − Keszthely, Diás-sziget, 2010.08.11, 3♀, lp − Vörs, Marót-völgyi-csatorna, 2010.05.27, 1♀.

Heteroceridae

Heterocerus fenestratus (Thunberg 1784) − Balatonmagyaród, Simon-sziget, 2009.07.01, 1♂, fcs; Zimányi-domb, 2009.07.02., 1♂, fcs − Keszthely, Diás-sziget, 2010.08.11, 34, lp.

Heterocerus fusculus Kiesenwetter 1843 − Balatonmagyaród, Simon-sziget, 2009.07.01, 5♂, fcs; Zimányi-domb, 2009.07.02., 6♂, fcs − Keszthely, Diás-sziget, 2010.08.11, 7, lp.

Heterocerus obsoletus Curtis 1828 − Balatonmagyaród, Simon-sziget, 2009.07.01, 5♂, fcs; Zimányi-domb, 2009.07.02., 1♂, fcs − Keszthely, Diás-sziget, 2010.08.11, 7, lp − Vörs, Máriaasszony-sziget, 2009.07.03.,1, fcs.

Dryopidae

Dryops anglicanus Edwards, 1909 − Balatonmagyaród, Hosszú-sziget north, 2010.04.29, 1♂; Hosszú-sziget south, 2010.04.29, 1♂ – Sármellék, Sikér, D-i oldal, 2010.04.10, 4.

Dryops auriculatus (Geoffroy, 1785) – Balatonmagyaród, Hosszú-sziget south, 2010.04.29, 1♂.

Scirtidae

Cyphon laevipennis Tournier, 1868 – Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 35, lp; Simon-sziget, 2009.07.01, 13, fcs; Zimányi-domb, 2009.07.02., 12, fcs − Keszthely, Diás-sziget, 2010.08.11, 33, lp − Sármellék, Sikér, D-i oldal, 2010.04.10, 1♂.

Cyphon padi (Linnaeus, 1758) − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 4, lp; Simon-sziget, 2009.07.01, 1, fcs; Zimányi-domb, 2009.07.02, 3, fcs − Sármellék, Sikér, D-i oldal, 2010.04.10, 1♂

Cyphon pubescens (Fabricius, 1792) − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 3, lp; Simon-sziget, 2009.07.01, 2, fcs; Zimányi-domb, 2009.07.02, 13, fcs − Sármellék, Sikér, D-i oldal, 2010.04.10, 1♂.

Scirtes hemisphaericus (Linnaeus, 1767) − Balatonmagyaród, Simon-sziget, 2009.07.01, 8, fcs; Zimányi-domb, 2009.07.02, 4, fcs.

Scirtes orbicularis (Panzer, 1793) − Balatonmagyaród, Almás-sziget, kilátó, 2010.07.13, 1, lp; Simon-sziget, 2009.07.01, 1, fcs; Zimányi-domb, 2009.07.02, 5, fcs − Keszthely, Diás-sziget, 2010.08.11, 2, lp.

The most important faunistic records are the followings

Sphaerius acaroides Waltl, 1838

The species is the only representative of the family and the subclass in Hungary. A European species except the Iberian Peninsula and also reported from Caucasus (LÖBL 2003). Rarely collected in Hungary. It can be easily overlooked due to its small size and is probably much more widespread than suggested by the findings known to us.

It lives on the shores of rivers and stagnant water bodies (BOUKAL et al. 2007).

Hydroporus scalesianus Stephens, 1828 (Fig. 2)

A northern and central European species (NILSSON & HOLMEN 1995). So far it was known only from a few localities in Hungary: Barcs, Beregdaróc, Dinnyés, Egerbakta, Halászi, Kunmadaras, Kővágóörs, Pálmonostor, Rakamaz (ÁDÁM 1986, CSABAI 2000, CSABAI 2001, CSABAI et al. 2001, CSABAI & NOSEK 2006, MÓRA et al. 2011). For the Hungarian distribution, see Fig. 2.

NILSSON & HOLMEN (1995) characterize it as a typical inhabitant of floating peat moss mats; it occurs also in peat bogs and small, densely vegetated fens (BOUKAL et al. 2007, CSABAI 2000).

Hydroporus umbrosus (Gyllenhal, 1808) (Fig. 3)

The distribution area of this species includes most of northern and central Europe and from Siberia to Kamchatka (NILSSON & HOLMEN 1995). It occurs only in three localities in Hungary, Budapest, Farkasfa and Táska (ÁDÁM 1992, 1996a, LŐKKÖS 2010). This is the second finding of the species in the region Dél-Dunántúl. For the Hungarian distribution, see Fig. 3.

It occurs in various types of standing water bodies, most often in those with dense vegetation and in peat bogs. In Hungary it occurs in woody fens (CSABAI 2000).

Laccornis oblongus (Stephens, 1835)

A Holarctic species (WOLFE & ROUGHLEY 1990). Very rare in Hungary, found only in the Kis-Balaton, in the Fenyős-sziget (CSABAI et al. 2001).

It occurs in open peaty wetlands. The new findings came from densely vegetated water bodies, tall-sedge dominated wetlands (*Magnocaricion elatae* Koch 1926) and sedge-beds (*Cladietum marisci* Zöbrist 1933 emend. Pfeiffer 1961).

Ilybius guttiger (Gyllenhal, 1818)

Central and North European species (NILSSON & HOLMEN 1995). It was known from a few localities in Hungary: Baja, Csaroda, Farkasfa, Ivánc, Keszthely, Kőszeg, Magyarszombatfa, Nógrádverőce (doubtful record), Sátoraljaújhely, Székesfehérvár, Szőce, Tokaj, Tolcsva, Zamárdi (ÁDÁM 1986, 1992, 1996a, b, ÁDÁM & HEGYESSY 2004, CSABAI et al. 2001, CSABAI et al. 2010, ENDRŐDI 1974).

It prefers largely vegetated permanent stagnant waters, like fens, marshes and ponds.

Hydrochus megaphallus Berge Henegouwen, 1988

Distributed in western, northern and central Europe (HEBAUER 1998, HANSEN 1999). It is rare in Hungary.

An acidophilous species preferring shallow water bodies with a muddy bottom and layer of detritus, most often found in the growths of sedges and rushes along the edges of both exposed and shaded fen-like habitats.

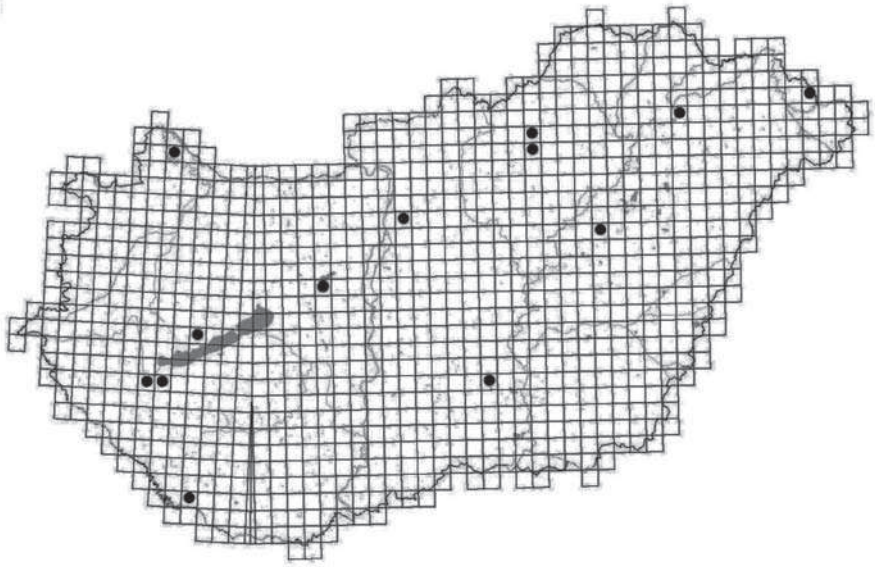

Fig. 2: Distribution of *Hydroporus scalesianus* Stephens, 1828 in Hungary (dots = recent records)

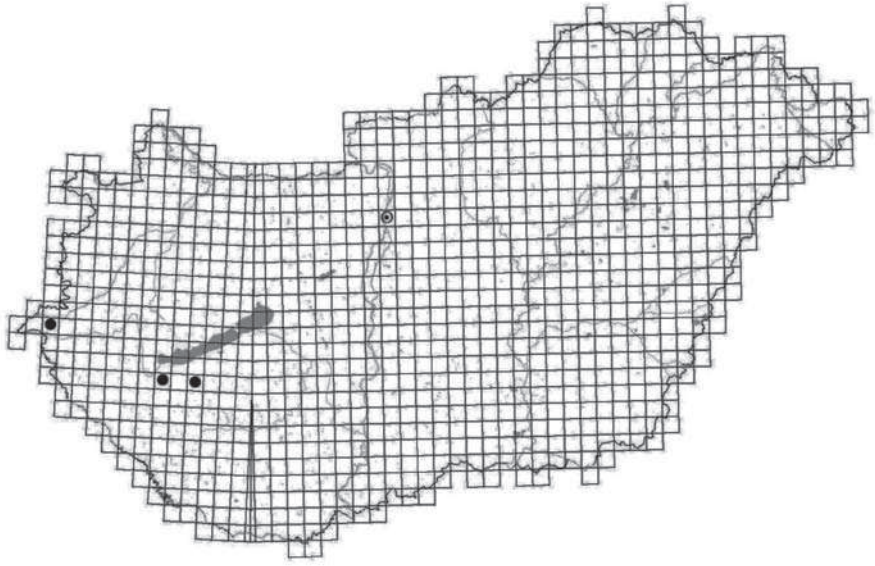

Fig. 3: Distribution of *Hydroporus umbrosus* (Gyllenhal, 1808) in Hungary (dots = recent records, circles with small dots = records older than 50 years)

Cercyon hungaricus Endrődy-Younga, 1968 was recently synonimised with *Cercyon bononiensis* Chiesa, 1964 (FIKÁČEK & ROCCHI 2013).

A Central and South European species, so far known only from few localities in Hungary, northern Slovenia, Slovakia, Czech Republic, South Germany and Italy (BÄSE 2010, CHIESA 1964, ENDRŐDY-YOUNGA 1967, FIKÁČEK et al. 2009, FIKÁČEK & ROCCHI 2013, HEBAUER 2003). In Hungary it is know only from few localities: Badacsony, Balatonlelle, Barcs, Fonyód, Lillafüred, Siófok, Zalavár (ENDRŐDY-YOUNGA 1967, 1969, 1970, FIKÁČEK et al. 2009, GIDÓ & SZÉL 1998). About this, the locality Zalavár belongs to the area of Kis-Balaton, the precise location is Zalavár env., Kis-Balaton, Diás-sziget, sifted, 20. iii. 1950 and the specimen is deposited in the Hungarian Natural History Museum, Budapest.

We know little about the bionomy of the species, it lives on shores by standing waters, fens (FIKÁČEK et al. 2009).

Dryops anglicanus Edwards, 1909

It is recorded in northern and north-western Europe from Great Britain to Russia, rare and localized in central Europe (KODADA & JÄCH 2006). In the south of Europe it is a postglacial relict (CORNACCA et al. 2004). In north and central European countries it is rare and included into Red lists or books (e.g. BINOT et al. 1998, PAINTER 1999, CORNACCA et al. 2004, BOUKAL 2005). It is rare in Hungary, but it shows large lack in the knowledge on the occurence of Dryopidae.

It is a tyrphophilous species and inhabits mainly in peatbogs (BOUKAL et al. 2006, BUCZYŃSKI & PRZEWOŹNY 2008, HENDRICH & BALKE 1994).

Heterocerus obsoletus Curtis 1828

Euro-Siberian species, widespread across Europe, Turkey, Iran, Central Asia, and Mongolia (MASCAGNI 2006). It is common at shores in northern Europe, but it is rare in Hungary. Halophilous species, often collected at light (BOUKAL et al 2006).

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Adatok Ócsa és környékének bogárfaunájához (Insecta: Coleoptera)

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Rozner, I.: *Data to the Beetle Fauna of Ócsa and surrudings*.
Abstract: Since the middle of the 1960s until 2013 methodical insect collectings were carried out in Ócsa and the surruding localities, such as in the vicinity of Alsónémedi, Inárcs and Dabas. Several nature reserves, forests, grazing lands and „turján" (swampy wetlands) can be found here. In this publication 260 beetle species from 32 families were listed which were collected in the above mentioned period. From these 7 species are protected. These are: *Carabus granulatus* L., *Copris lunaris* (L.), *Acmaeoderella mimouti* (Boil.), *Calamobius filum* (Rossi), *Dorcadion decipiens* Germ., *Oberea euphorbiae erythrocephala* (Schrank), *Theophilea subcylindricollis* Hladil.

Keywords: faunistic data, Hungary, Coleoptera,

Bevezetés

Az 1960-as évek közepétől rendszeres rovargyűjtéseket végeztem Asónémeditől Dabasig terjedő turjánvidéken és a környező erdős, füves részeken. A Pest megyei terület a Duna-Ipoly Nemzeti Parkhoz tartozik, több tájvédelmi körzetet és más védett területet foglal magában. Az itt felsorolt fajok listája korántsem teljes a területen található bogárfajokról, de áttekintést ad a változatos bogárcsaládok előfordulásáról.

Anyag és módszer

A koleopterológiai kutatások négy község területére terjedtek ki. Ezeket a területeket rövidítve közlöm a gyűjtött fajok jegyzékében.

1. Alsónémedi (A): 2012 áprilisában a helyi természetvédők kérésére gyűjtőútat szerveztünk az alsónémedi turján vidékére Podlussány Attilával. A gyűjtések érintették a vizes, cserjés részeket, tisztásokat és kaszálókat. A gyűjtött anyag fajlistáját továbbítottuk az illetékes természetvédelmi szerveknek. Jelen közlemény is tartalmazza az itt talált bogárfajokat.
2. Ócsa (Ó): A gyűjtések kiterjedtek a Duna-Ipoly Nemzeti Parkhoz tartozó védett részekre mint az Ócsai Természetvédelmi Körzet, és a Nagyturján, az ócsai Öreg-erdő, Babádpuszta, a Duna-Tisza Csatorna melléke (Felső-Babád).
3. Inárcs (I): A gyűjtések érintették az Ócsai Természetvédelmi Körzetnek az inárcsi községhatáron átnyúló részét, a Rókás-mocsarat és a turjános területeket.

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4. Dabas (D): Az itt közölt gyűjtési adatok a Dunavölgyi Főcsatornától északnyugatra fekvő területeket érintette. A délkeleti részen a csatornán túl homokhátság húzódik, ami eltér az előbbi turjános, vizes részektől. A gyűjtések főbb helyszínei: Dabasi Turjános Természetvédelmi Terület, lőtér, Dunavölgyi Főcsatorna melléke, kaszálók, legelők.

A bogarak rendszerezésénél a LAWRENCE & NEWTON (1995) és BEUTEL & HAAS (2000) rendszerét vettem alapul. Nem vettem figyelembe az általuk közölt lemezescsápú bogarak (Scarabaeoidea) családbeosztását. Ennél az öregcsaládnál (Superfamily) a hazai bogárgyűjtők által használt BARAUD (1997) európai monográfiáját vettem alapul. A levélbogarak (Chrysomelidae) határozásához WARCHALOWSKI (2003) európai és mediterrán monográfiáját használtam. A határozásokhoz még felhasználtam a következő irodalmakat: ENDRŐDI (1956), KASZAB (1955, 1956, 1957, 1971), MUSKOVITS & HEGYESSY (2002).

A fajlista összeállításánál nem vettem figyelembe a korábbi irodalmi adatokat. A gyűjtött fajok jegyzéke csak az általam gyűjtött bogarakat tartalmazzák, kiegészítve Podlussány Attilával Alsónémedin együtt gyűjtött ormányosalkatú bogarakkal. A fajlistában szereplő fajok a családokon belül alfabetikus sorrendben szerepelnek.

Eredmények és értékelés

1960 óta napjainkig terjedő időben a felsorolt négy település határában gyűjtött és a jelen dolgozatomban tárgyalt bogárcsaládok eredményei a következők:

A bogarak 11 öregcsaládjából (Superfamily) 32 család (Family) fajait tartalmazza ez a dolgozat. Összesen 260 gyűjtött bogárfaj szerepel az Asónémedi, Ócsa, Inárcs és Dabas községek területéről. A közölt fajok közül 7 faj védett, egyenként 2000 forint eszmei értéket képviselve.

A gyűjtött fajok jegyzéke

Alrend: ADEPHAGA

Család: Gyrinidae
Gyrinus distinctus Aubé, 1836 - Ó
Gyrinus natator (Linnaeus, 1758) - Ó
Gyrinus substriatus Stephens, 1829 - Ó

Család: Haliplidae
Haliplus fluviatilis Aubé, 1836 - Ó

Család: Dytiscidae
Cybister lateralimarginalis (De Geer, 1774) - Ó
Laccophilus minutus (Linnaeus, 1758) - Ó
Noterus crassicornis (O.F. Müller, 1776) - Ó
Rhantus notatus (Fabricius, 1781) - Ó
Rhantus punctatus Fourcroy, 1785 - Ó

Család: Carabidae
Agonum permoestum Puel, 1930 - Ó
Amara aenea (De Geer, 1774) - I
Amara anthioba A. et G.B. Villa, 1833 - A
Amara consularis (Duftschmid, 1812) - Ó
Amara ovata (Fabricius, 1792) - Ó
Amara plebeja (Gyllenhal, 1810) - I
Anchomenus dorsalis (Pontoppidan, 1763) - Ó
Anisodactylus binotatus (Fabricius, 1787) - I
Anisodactylus signatus (Panzer, 1797) - I, Ó
Bembidion articulatum (Panzer, 1796) - I
Bembidion properans (Stephens, 1828) - I, Ó
Broscus cephalotes (Linnaeus, 1758) - Ó
Calathus ambiguus (Paykull, 1790) - Ó
Calathus fuscipes (Goeze, 1777) - Ó
Carabus granulatus Linnaeus, 1758 - Ó - védett
Elaphrus cupreus Duftschmid, 1812 - I
Harpalus autumnalis (Duftschmid, 1812) - A
Harpalus distinguendus (Duftschmid, 1812) - Ó
Harpalus smaragdinus (Duftschmid, 1812) - Ó
Paradromius linearis (Olivier, 1795) - A
Parophonus maculicornis (Duftschmid, 1812) - I
Pseudophonus calceatus (Duftschmid, 1812) - Ó
Pseudophonus rufipes (De Geer, 1774) - Ó
Pterostichus melanarius (Illiger, 1798) - Ó
Zabrus tenebrionides (Goeze, 1777) - Ó

Alrend: POLYPHAGA

Öregcsalád: Hydrophiloidea
Család: Hydrophilidae
Sphaeridium bipustulatum Fabricius, 1781 - I
Sphaeridium scarabaeoides (Linnaeus, 1758) - I

Család: Histeridae
Dendrophilus punctatus (Herbst, 1792) - D
Margarinotus brunneus (Fabricius, 1775) - Ó
Margarinotus carbonarius (Hoffmann, 1803) - Ó
Margarinotus purpurascens (Herbst, 1792) - Ó
Saprinus aeneus (Fabricius, 1775) - I
Saprinus planiusculus Motschulsky, 1849 - I
Saprinus semistriatus (Scriba, 1790) - I

Öregcsalád: Staphylinoidea
Család: Silphidae
Necrophorus vespillo (Linnaeus, 1758) - Ó
Oiceoptoma thoracica Linnaeus, 1758 - Ó
Phosphuga atrata Linnaeus, 1758 - Ó
Silpha carinata Herbst, 1783 - Ó
Silpha tristis Illiger, 1798 - Ó

Thanatophilus rugosus Linnaeus, 1758 - D, I, Ó
Thanatophilus sinuatus Fabricius, 1775 - I

Család: Staphylinidae
Dexiogyia corticina (Erichson, 1837) - D
Oxyporus rufus (Linnaeus, 1758) - D
Paederus littoralis Gravenhorst, 1802 - Ó

Öregcsalád: Scarabaeoidea
Család: Trogidae
Trox sabulosus (Linnaeus, 1758) - Ó

Család: Aphodiidae
Aphodius coenosus (Panzer, 1798) - A, I
Aphodius depressus (Kugelann, 1792) - A
Aphodius distinctus (O.F. Müller, 1776) - A
Aphodius erraticus (Linnaeus, 1758) - D, I
Aphodius fimetarius (Linnaeus, 1758) - D, I
Aphodius granarius (Linnaeus, 1758) - Ó
Aphodius haemorrhoidalis (Linnaeus, 1758) - D, I
Aphodius immundus Creutzer, 1799 - D
Aphodius paracoenosus Balthasar et Hrubant,1960 - D
Aphodius prodromus (Brahm, 1790) - A, Ó
Aphodius pusillus (Herbst, 1789) - D, I
Aphodius sabulicola Thomson, 1868 - Ó
Aphodius subterraneus (Linnaeus, 1758) - A, D, I

Család: Scarabaeidae
Caccobius schreberi (Linnaeus, 1767) - D
Copris lunaris (Linnaeus, 1758) - D, I - védett
Euoniticellus fulvus (Goeze, 1777) - D, I
Onthophagus coenobita (Herbst, 1783) - A
Onthophagus fracticornis Preyssler, 1790 - A
Onthophagus illyricus (Scopoli, 1763) - D
Onthophagus nuchicornis (Linnaeus, 1758) - D
Onthophagus ovatus (Linnaeus, 1767) - I, Ó
Onthophagus ruficapillus Brullé, 1832 - D, I, Ó
Onthophagus taurus (Schreber, 1759) - A, I
Onthophagus vacca (Linnaeus, 1767) - D

Család: Melolonthidae
Amphimallon assimile (Herbst, 1790) - D
Anisoplia lata lata Erichson, 1847 - I
Anomala dubia (Scopoli, 1763) - Ó
Anomala vitis (Fabricius, 1775) -I, Ó

Család: Cetoniidae
Tropinota hirta (Poda, 1761) - A, D, I, Ó

Öregcsalád : Buprestoidea
Család: Buprestidae
Acmaeoderella mimouti (Boildieu, 1865) - D - védett
Agrilus roberti Chevrolat, 1837 - I
Coraebus elatus (Fabricius, 1787) - Ó
Cylindromorphus filum (Gyllenhal, 1817) - D
Trachys minutus minutus (Linnaeus, 1758) - A, I

Öregcsalád: Elateroidea
Család: Elateridae
Actenicerus sjaelandicus (O.F. Müller, 1764) - I
Agriotes pilosellus (Schönherr, 1817) - D
Agriotes ustulatus (Schaller, 1783) - Ó
Agrypnus murinus (Linnaeus, 1758) - D, I, Ó
Athous haemorrhoidalis (Fabricius, 1801) - Ó
Cidnopus pilosus (Leske, 1785) - A
Dicronychus equiseti (Herbst, 1784) -A
Dicronychus rubripes (Germar, 1824) - A, D
Limonius poneli Lessing et Mertlik, 2007 - A
Liotrichus affinis (Paykull, 1800) - Ó
Melanotus punctolineatus (Pelerin, 1829) - I
Melanotus rufipes Herbst, 1784 - I

Család: Cantharidae
Cantharis erichsoni (Bach, 1852) - Ó
Cantharis fusca Linnaeus, 1758 - I
Cantharis lateralis Linnaeus, 1758 D, I
Cantharis pellucida Fabricius, 1792 - I
Cantharis rufa Linnaeus, 1758 - Ó
Cantharis rustica Fallén, 1807 - D, Ó
Rhagonycha fulva (Scopoli, 1763) - Ó
Rhagonycha limbata Thomson, 1864 - I
Rhagonycha testacea (Linnaeus, 1758) - I

Öregcsalád: Bostrichoidea
Család: Dermestidae
Dermestes frischi Kugelann, 1792 - I, Ó
Dermestes murinus Linnaeus, 1758 - I

Öregcsalád: Cleroidea
Család: Malachiidae
Malachius bipustulatus Linnaeus, 1758 - I, Ó
Malachius geniculatus Germar, 1824 - D, I

Család: Melyridae
Dolichosoma lineare Rossi, 1792 - D

Öregcsalád: Cucujoidea
Család: Byturidae
Byturus aestivus Linnaeus, 1758 - Ó

Család: Coccinellidae
Adalia bipunctata Linnaeus, 1758 - D
Coccinella quinquepunctata Linnaeus, 1758 - D
Coccinula quatuordecimpustulata (Linnaeus, 1758) - A
Exochomus nigromaculatus (Goeze, 1777) - D
Hippodamia tredecimpunctata Linnaeus, 1758 - Ó
Hippodamia variegata (Goeze, 1777) - A
Propylaea quatuordecimpunctata Linnaeus, 1758 - A, D, I
Psyllobora vigintiduopunctata (Linnaeus, 1758) - A, Ó
Subcoccinella vigintiquatuorpunctata Linnaeus, 1758- Ó
Tytthaspis sedecimpunctata (Linnaeus, 1758) - A

Öregcsalád: Tenebrionidea
Család: Oedemeridae
Anogcodes ruficollis Fabricius, 1781 - Ó
Nacerda ustulata Fabricius, 1787 - I, Ó
Oedemera croceicollis Gyllenhal, 1827 - D
Oedemera femorata (Scopoli, 1763) - D, I
Oedemera laticollis Seidl, 1899 - I, Ó
Oedemera lurida Marsham, 1802 - D
Oedemera podagrariae Linnaeus, 1767 - Ó

Család: Pyrochroidae
Pyrochroa coccinea (Linnaeus, 1761) - Ó
Pyrochroa serraticornis (Scopoli, 1763) - Ó

Család: Anthicidae
Notoxus monoceros Linnaeus, 1761 - A, Ó

Család: Tenebrionidae
Crypticus quisquilius (Linnaeus, 1761) - D, Ó
Diaclina testudinea Piller et Mitterpacher, 1783 - D
Diaperis boleti (Linnaeus, 1758) - D, Ó
Lagria atripes tenuicollis Seidl, 1898 - D
Melanimon tibiale (Fabricius, 1781) - D
Mycetochara quadrimaculata (Latreille, 1804) - D
Neatus picipes Herbst, 1797 - D
Omophlus lividipes Mulsant, 1752 - D
Opatrum sabulosum (Linnaeus, 1761) - A, D, I, Ó
Pedinus femoralis Linnaeus, 1767 - A, D, Ó

Öregcsalád: Chrysomeloidea
Család: Cerambycidae
Agapanthia dahli (Richter, 1821) - D
Calamobius filum (Rossi, 1790) - D - védett
Chlorophorus varius (O.F. Müller, 1766) - Ó

Clytus rhamni Germar, 1817 - I
Dinoptera collaris (Linnaeus, 1758) - Ó
Dorcadion decipiens Germar, 1824 - D - védett
Echinocerus floralis (Pallas, 1773) - Ó
Grammoptera ruficornis (Fabricius, 1781) - A
Lamia textor (Germar, 1824) - Ó
Leptura quadrifasciata Linnaeus, 1758 - I
Oberea euphorbiae erythrocephala (Schrank, 1776) - D - védett
Phytoecia cylindrica (Linnaeus, 1758) - Ó
Phytoecia pustulata (Schrank, 1776) - A
Pseudovadonia livida pecta J. Daniel et K. Daniel, 1891 - I
Theophilea subcylindricollis Hladil, 1988 - A - védett
Tetrops praeusta (Linnaeus, 1758) - A, D
Xylotrechus rusticus (Linnaeus, 1758) - Ó

Család: Chrysomelidae
Altica carduorum Guérin-Méneville, 1858 - D
Altica impressicollis (Reiche, 1962) - I
Altica quercetorum Weise, 1888 - I, Ó
Aphthona nigriscutis Foudras, 1861 - D
Cassida nebulosa Linnaeus, 1758 - Ó
Cassida pannonica Suffrian, 1844 - I
Cassida rubiginosa O.F. Müller, 1776 - D
Chrysolina fastuosa (Scopoli, 1763) - I
Chrysolina graminis (Linnaeus, 1758) - D
Chrysolina polita (Linnaeus, 1758) - I
Chrysomela populi Linnaeus, 1758 - D, I
Clytra laeviuscula (Ratzeburg, 1837) - D, I, Ó
Coptocephala unifasciata (Scopoli, 1763) -Ó
Crepidodera aurata (Marsham, 1802) - D
Crepidodera aurea (Fourcroy, 1785) - I
Crepidodera lamina (Bedel, 1901) - Ó
Crioceris duodecimpunctata (Linnaeus, 1758) - I
Crioceris quatuordecimpunctata (Scopoli, 1763) - D
Cryptocephalus bameuli Duhaldeborde, 1999 - D
Cryptocephalus ocellatus Drapiez, 1819 - D
Cryptocephalus sericeus sericeus (Linnaeus, 1758) - D
Cryptocephalus transiens Franz, 1949 - I
Galeruca dahli (Joannis, 1866) - I
Leptinotarsa decemlineata (Say, 1824) - I, Ó
Lilioceris merdigera (Linnaeus, 1758) - Ó
Neocrepidodera ferruginea (Scopoli, 1763) - D
Neocrepidodera transversa (Marsham, 1802) - D, I, Ó
Oulema gallaeciana (Heyden, 1870) - D
Oulema melanopus (Linnaeus, 1758) - Ó
Phratora vitellinae (Linnaeus, 1758) - I
Phratora vulgatissima (Linnaeus, 1758) - Ó
Phyllobrotica quadrimaculata (Linnaeus, 1758) - D
Phyllotreta nemorum (Linnaeus, 1758) - D
Psylliodes thlaspis Foudras, 1860 - D
Sphaeroderma rubidum (Graëlls, 1858) - Ó

Öregcsalád: Curculionoidea
Család: Anthribidae
Platyrhinus resinosus (Scopoli, 1763) - Ó

Család: Rhynchitidae
Byctiscus betulae (Linnaeus, 1758) - D
Byctiscus populi (Linnaeus, 1758) - D
Neocoenorrhinus aequatus (Linnaeus, 1767) - D
Tmenocerus tomentosus (Gyllenhal, 1829) - I

Család: Apionidae
Ceratapion onopordi (Kirby, 1808) - D
Eutrichapion viciae (Paykull, 1800) - A
Holotrichapion pisi (Fabricius, 1801) - D
Protapion fulvipes (Geoffroy, 1785) - A
Protapion varipes (Germar, 1817) - A
Stenopterapion meliloti (Kirby, 1808) - A
Stenopterapion tenue (Kirby, 1808) - A
Taeniapion urticarium (Herbst, 1784) - A

Család: Curculionidae
Anthonomus rubi (Herbst, 1795) - A
Ceutorhynchus obstrictus (Marsham, 1802) - A
Ceutorhynchus typhae (Herbst, 1795) - A
Dorytomus melanophthalmus (Paykull, 1792) - D
Glocianus punctiger (Sahlberg, 1835) - A
Gymnetron rostellum (Herbst, 1795) - D
Hypera miles (Paykull, 1792) - A
Hypera nigrirostris (Fabricius, 1775) - A
Hypera postica (Gyllenhal, 1813) - A
Hypera viciae (Gyllenhal, 1813) - A
Larinus jaceae (Fabricius, 1775) - D, I
Larinus sturnus (Schaller, 1783) - D, I
Larinus turbinatus Gyllenhal, 1836 - D
Lepyrus palustris (Scopoli, 1763) - I
Limnobaris dolorosa (Goeze, 1777) - A
Lixus albomarginatus Boheman, 1843 - D
Lixus cardui Olivier, 1808 - A, I
Lixus elongatus (Goeze, 1777) - D
Magdalis barbicornis (Latreille, 1804) - D
Mecinus labilis (Herbst, 1795) - A
Mogulones raphani (Fabricius, 1792) - A
Nedius quadrimaculatus (Linnaeus, 1758) - A
Omias seminulum (Fabricius, 1792) - A, D,
Otiorhynchus ovatus (Linnaeus, 1758) - Ó
Peritelus familiaris Boheman, 1834 - A, D
Phyllobius oblongus (Linnaeus, 1758) - A, D
Phyllobius pyri (Linnaeus, 1758) - I
Phyllobius vespertinus (Fabricius, 1792) - A
Phyllobius viridiaeris (Laicharting, 1781) - A, D

1. táblázat: A gyűjtött fajok száma családonként és lelőhelyenként

Család	Alsónémedi	Dabas	Inárcs	Ócsa	Összes faj
Gyrinidae				3	3
Haliplidae				1	1
Dytiscidae				5	5
Carabidae	3		8	16	25
Hydrophilidae			2		2
Histeridae		1	3	3	7
Silphidae		1	2	5	7
Staphylinidae		2		1	3
Trogidae				1	1
Aphodiidae	5	7	6	3	13
Scarabaeidae	3	7	5	2	11
Melolonthidae		1	2	2	4
Cetoniidae	1	1	1	1	1
Buprestidae	1	2	2	1	5
Elateridae	4	3	4	4	12
Cantharidae		2	5	4	9
Dermestidae			2	1	2
Malachiidae		1	2	1	2
Melyridae		1			1
Byturidae				1	1
Coccinellidae	5	4	1	3	10
Oedemeridae		3	3	4	7
Pyrochroidae				2	2
Anthicidae	1				1
Tenebrionidae	2	10	1	4	10
Cerambycidae	4	5	3	6	17
Chrysomelidae		17	14	11	35
Anthribidae				1	1
Rhynchitidae		3	1		4
Apionidae	6	2			8
Curculionidae	26	21	8	4	49
Scolytidae				1	1
Összes faj	**61**	**94**	**75**	**92**	**260**

Phytonomus arator (Linnaeus, 1758) - D
Phytonomus rumicis (Linnaeus, 1758) - Ó
Polydrusus cervinus (Linnaeus, 1758) - A, D
Polydrusus flavipes (De Geer, 1775) - D
Polydrusus mollis Strom, 1768 - I
Polydrusus picus (Fabricius, 1792) - D
Rhampus pulicarius (Herbst, 1795) - A
Rhinocyllus conicus (Fröhlich, 1792) - D
Rhinusa tetrum (Fabricius, 1792) - Ó
Sibinia pelluscens (Scopoli, 1772) - A, D
Sitona flavescens (Marsham, 1802) - I

Sitona humeralis Stephens, 1821 - A, D
Sitona lineatus (Linnaeus, 1758) - A
Sitona macularius (Marsham, 1802) - A
Sitona suturalis Stephens, 1831 - I
Sphenophorus striatopunctatus (Goeze, 1777) - D
Stereonychus fraxini (De Geer, 1775) - Ó
Tanymecus palliatus (Fabricius, 1787) - D
Tychius cuprifer (Panzer, 1799) - A
Tychius quinquepunctatus (Linnaeus, 1758) - A

Család: Scolytidae
Orthotomicus laricis (Fabricius, 1792) - Ó

Köszönetnyilvánítás

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Irodalom

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Contribution to the knowledge of the genus *Halter* (Neuroptera: Nemopteridae)

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Ábrahám, L.: *Contribution to the knowledge of the genus Halter (Neuroptera: Nemopteridae).*
Abstract: This paper summarizes all information on the genus *Halter* living in South Western Palearctic and West Oriental regions. The type and non type materials are preserved in different collections, they were re-identified and seven taxa were checked. *Halter halteratus* (Forskål, 1775) is a widespread species in North Africa and South West Asia. *Halter libratus* Navás, 1910 (syn. n.) from Sudan is a new junior synonym of *Halter halteratus* (Forskål, 1775). *Halter nutans* Navás, 1910 spreads only in South West Asia. The type specimen of *Halter albostigma* (Westwood, 1874) was mislabelled since all species of the genus are known only from the South Western Palearctic to the West Oriental area. Recently, *Halter albostigma* (Westwood, 1874) was recorded in South East Pakistan. The examined material agrees well morphologically with the type specimen. The type specimen of *Eretmoptera neglecta* Navás, 1910 has been recently found and checked. It also proved to be a synonym of *Barbibucca biremis* (Kolbe, 1900) and the type came from South Africa not from Oriental as it was considered before. *Nemopistha sinica* C.-k. Yang, 1986 from South China is a valid species but generic revision is needed in the future. With 25 figures.

Keywords: Nemoptera, Halter, new synonym, type specimen

Introduction

The species of Nemopteridae Burmeister, 1839 are very attractive insects, their hindwings are strongly elongated, head and mouth parts are specialized in pollen consumption. Their larvae show high morphological similarity and lifestyle to the larvae of antlions and owl-flies.

About 150 species were described in two subfamilies (Crocinae Navás, 1910, Nemopterinae Burmeister, 1839) all around the world (Oswald 2007).

The highest number of species (49 sp.) in the subfamily of Nemopterinae is known in South Africa (Tjeder 1967), compared to the West Palearctic region where only 24 species can be found (Hölzel 1999, Aspöck et al. 2001).

Based on the daily activities, these species can be classified into two groups. The yellow and dark species of the genus, *Nemoptera* Latreille, 1802 are active only in daytime. The colourless transparent forewing species of genera *Lertha* Navás, 1910, *Halter* Rambur, 1842, *Brevistoma* Tjeder, 1967 and *Savignyella* Kirby, 1900 are active mainly at night and attracted by light, but pollen feeding behaviour can be also observed during daytime.

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According to TJEDER (1967), HÖLZEL (1999), ASPÖCK et al. (2001, 2006), we need to revise the Palearctic genera: *Brevistoma* Tjeder, 1967, *Halter* Rambur, 1842, *Kyrbinia* Navás, 1910, *Lertha* Navás, 1910, *Olivierina* Navás, 1910 and *Savignyella* Kirby, 1900.

In South Western Palearctic, three valid *Halter* species are known (HÖLZEL 1999).

Halter halteratus (Forskål, 1775) described from Yemen is a widespread species all over the Saharan Africa and partly in the Arabian Peninsula. It is considered to be a Polycentric afro-syroeremial faunal element (ASPÖCK et al. 2001).

According to HÖLZEL (1999) *Halter libratus* Navás, 1910 is probably a synonym of *Halter halteratus* (Forskål, 1775) since the distribution of the two taxa overlaps in the part of Saharan Africa and the only type specimen is known from Sudan.

ASPÖCK et al. (2001) listed two valid *Halter* species, *Halter halteratus* (Forskål, 1775) and *Halter nutans* Navás, 1910 in the Western Palearctic but their distributions remained unclear (HÖLZEL 1968, 1999, MEINANDER 1980) till recently. *Halter nutans* described from Pakistan is an Irano-eremial faunal element (ASPÖCK et al. 2001).

The fourth species, *Halter albostigma* (Westwood, 1874) is a hidden species since only the type specimen has been known from South Africa till now. According to TJEDER (1967) the type locality doubful because the distribution area of all *Halter* species restricted to the Northern Hemisphere.

Further retarding factor in the separation of these species is the lack of significant difference in their genitalia structures (TJEDER 1970, HÖLZEL 1999).

Our limited knowledge on their distribution and also the genera of subfamily of Nemopterinae need of revision (HÖLZEL 1999). In addition, *Nemopistha sinica* C.-k. Yang, 1986 described from China belonging to Nemopterinae can not be congeneric with any African genera.

Material and methods

After receiving some *Halter* specimens from Pakistan for identification, I realized that these specimens were not conspecific with any well-known Palearctic species, namely *Halter halteratus* and *H. nutans* either. Studying the literature, I found several unsolved nomenclature and taxonomic problems which had to be checked in the collections where the type specimens preserved and had to check the non type material as well.

Good resolution photos of type material were collected from the following museums: Museum National d'Histoire Naturelle, Paris, France; the Natural History Museum, London, UK; Hope-Westwood Entomological Collections, Oxford University, UK. All non type specimens preserved in the entomological collection of Rippl-Rónai Museum (Kaposvár) were reidentified and compared to the photos of the type specimens. The morphological examinations were completed with the help of the non type material.

Results and discussion

Abbreviations: Chlist – Checklist, Comb – New combination, Dist – Distribution, Fig – Figure, K – Key with comment, Misid – Misidentification, Mon – Monograph, Morph – Morphology, Odescr – Original description, Syn – Synonym, Tdesign – Type designation, Tcom – Type comment

FW - Forewing, HW - Hindwing, C - Costa, Sc - Subcosta, R - Radius, M - Media, Rs - Radius sector, CuA - Cubitus anterior, CuP - Cubitus posterior

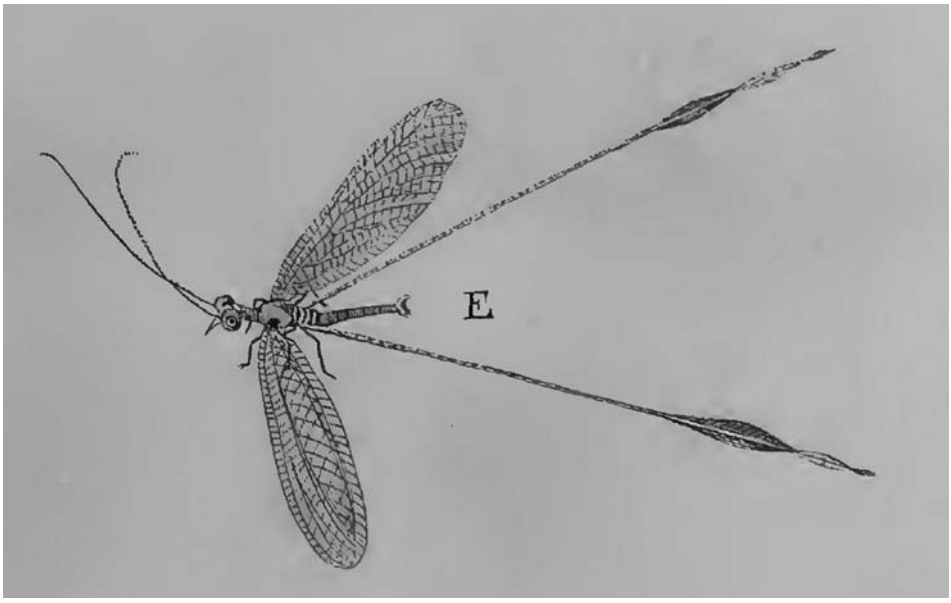


Fig. 1: ***Panorpa halterata*****, the original figure published by FORSKÅL & CARSTEN (1776) and OLIVIER (1797) as "*Le Panorpe d'Orient*"**

Halter Rambur, 1842

Type species: *Panorpa halterata* Forskål, 1775 - ASPÖCK et al. 2001 (Tdesign)
Nemoptera alba Olivier, 1811 - DESMAREST in D'ORBIGNY 1849 (Tdesign), KIRBY 1900 (Tcom)
Nemoptera pallida Olivier, 1811 - KIRBY 1900 (Tdesign)

Medium sized. Rostrum produced into a beak. Pronotum trapezoid shaped, relatively short. Forewing transparent, subcostal area hyaline to yellow. Pterostigma small and distinct. Rs originates at middle or beyond of wing. CuA slightly arched, CuA and CuP united near base. Hindwing at least twice longer than forewing. Hindwing with only simple dilation. Sexual dimorphism present. Female usually larger than male. Male antenna longer than that of female, hindwing dilation wider on female than that of male. Abdomen slender. Male ectoproct oval with distal hairs. Sternite 9 slipper-like shaped with disto-lateral lobes and with medium long hairs. Gonarcus has wide arch with a pair of prominent latero-dorsal processes. Gonolatus membraneous with two groups of long gonosetae and several shorter hairs. Mediuncus present. Parameres with long bent apex. (Figs. 20-23). Female ectoproct oval with distal hairs. Lateral gonapophyses slightly oval with short hairs. A sclerotized brush-like structure on each side below ectoporct. (Figs. 18-19). The function of this structure is unknown. Spermatheca elongate sligthly chitinised.

Remarks: The type of the genus was designated by DESMAREST in D'ORBIGNY [1846] (1949) as *Nemoptera alba* Olivier, 1811 but it did not belong to Nemopterinae. Later, KIRBY (1900) designated *Nemoptera pallida* Olivier, 1811 as generic type species based on RAMBUR's (1842) description. OSWALD & PENNY (1991) mentioned *Nemoptera alba* Olivier, 1811 as generotype again. Finally, ASPÖCK et al. (2001) called our attention to the incorrect type designation.

Halter halteratus (Forskål, 1775)

Type: Beit el Fakih, (Bayt-el-Faqih, Yemen) - type deposition unknown.
Panorpa halterata Forskål, 1775 - FORSKÅL 1775 (Odescr), FORSKÅL & CARSTEN 1776 (Fig) , FABRICIUS 1781 (Morph, Misid), 1787 (Morph, Misid), 1798 (Dist, Misid), GMELIN 1788 (Morph, Misid), OLIVIER 1797 (Fig. as "Le Panorpe d'Orient") (Fig. 1)
Nemoptera halterata (Forskål, 1775) - OLIVIER 1811 (Comb, Dist, Misid), LAMARCK 1817 (List), WALKER 1853 (Mon), SÉLYS-LONGCHAMPS 1866 (Fig)
Nemoptera pallida Olivier, 1811 - OLIVIER 1811 (Odescr), KLUG 1836 (Syn), RAMBUR 1842 (Morph, Dist, Fig), NAVÁS 1910 (Syn)
Nematoptera pallida (Olivier, 1811) - WESTWOOD 1841 (Comb)
Nematoptera forskalli Westwood, 1841 - WESTWOOD 1841 (Odescr), HAGEN 1866 (Syn), NAVÁS 1910 (Syn)
Halter halterata (Forskål, 1775) - KIRBY 1900 (Comb, Dist), NEEDHAM 1909 (Dist, Misid)
Halter halteratus (Forskål, 1775) - NAVÁS 1910 (K, Dist), 1913a (Dist), 1913b (Dist), 1926 (Dist), 1927 (Dist), ESBEN-PETERSEN 1918 (Dist), MORTON 1921 (Dist, Misid?), AUBER 1955 (Dist), GHOSH 1977 (Dist, Misid), GHOSH & SEN 1977 (Dist, Misid), MEINANDER 1980 (Dist, Misid), MONSERRAT et al. 1990 (Dist), 2008 (Dist), ASPÖCK & HÖLZEL 1996 (Dist), HÖLZEL 1998 (Dist), 1999 (Dist), ASPÖCK et al. 2001 (Dist), Chandra and Sharma (?) (Dist, Misid)
Halter libratus Navás, 1910 - NAVÁS 1910 (Odescr), 1912a (Dist), 1912c (Dist, K), HÖLZEL 1999 (Com), ***syn. n***.

Material examined:
The type specimen of *Nemoptera pallida* Olivier, 1811 preserved in MNHP - Museum National d'Histoire Naturelle, Paris, France.
The type label information: white label with red letters: // Type //; white label: // Museum Paris / Bagdad / 15 l. N-O / Olivier // [with unknown handwriting], white label: // pallida Ol[ivier] / [with Olivier's handwriting] / halterata Forskael // [with unknown handwriting]; white label in squared paper: // Halter / halteratus ♀ / Forsk. // [with Navás's handwriting]; white label: // Halter / halteratus / Forsk [with unknown handwriting] Login Navás det. 1910. // (Fig. 2)
Type condition: average, antenna missing, costal area of forewing torn and glued, end of left hindwing broken.

The type specimen of *Halter libratus* Navás, 1910 preserved in BMNH - The Natural History Museum, London, UK.
The type label information: round white label with red edge: // Type //; white label: // BMNH(E) 1201791 //; white label: // Khartoum / S. S. Flower. / 1905 27 4 //; white label in squared paper: // Halter / libratus ♀ / Type. Nav.[ás] // [with Navás's handwriting]; white label / H. u. U. Aspöck vid. 1981 / (Fig. 3)
Type condition: good, antenna missing, abdomen broken preserved in a genital vial.

Additional non types: Morocco 6 km Ait Saoun 1606m N30˚42'22.5";W06˚35'59.0" 06.25.2008 Leg: Ábrahám L., Bognár L., Nagy L.1♀; Morocco 5 km from Tissint 647m N29˚52"20.0';W07˚16"45.8' 07.05.2008. Leg: Ábrahám L., Fábián, Gy., Rozner, Gy. 4♂ 4♀; Morocco 5 km from Tissint 647m N29˚52"2 0.0';W07˚16"45.8'12.06.2010. Leg: Ábrahám L., Kisbenedek T., Wágner L. 1♀; Morocco 13 km SW from Agdz 1050m N30˚39'11.6"; W06˚33'51.2"16.06.2010. Leg: Ábrahám L., Kisbenedek T., Wágner L. 3♂ 1♀; Morocco 13km SW from Agdz 1050m N30˚39'11.6";W06˚33'51.2"13.06.2010. Leg: Ábrahám L., Kisbenedek T., Wágner L. 1♂ 1♀. Deposited in the entomological collection of Rippl-Rónai Museum Kaposvár (Hungary).

Remarks: There are only little morphological differences between the *Halter* species and also between the different genera of subfamily Nemopterinae, namely: *Lertha* Navás, 1910, *Halter* Rambur, 1842, *Brevistoma* Tjeder, 1967 and *Savignyella* Kirby, 1900. TJEDER (1967) and HÖLZEL (1999) pointed out that the examination of the genitalia of the closely related species could not always yield results, because the genitals were very similar. Due to the sexual dimorphism, the male and the female specimens of the same species have been doubtful for a long time. Thus, the identification of the species of these genera repeatedly caused difficulties, as it shows in case of *Halter halteratus* in the literature (see below).

Fig. 2: The type specimen of *Nemoptera pallida* Olivier, 1811 preserved in MNHP - Museum National d'Histoire Naturelle, Paris, France.

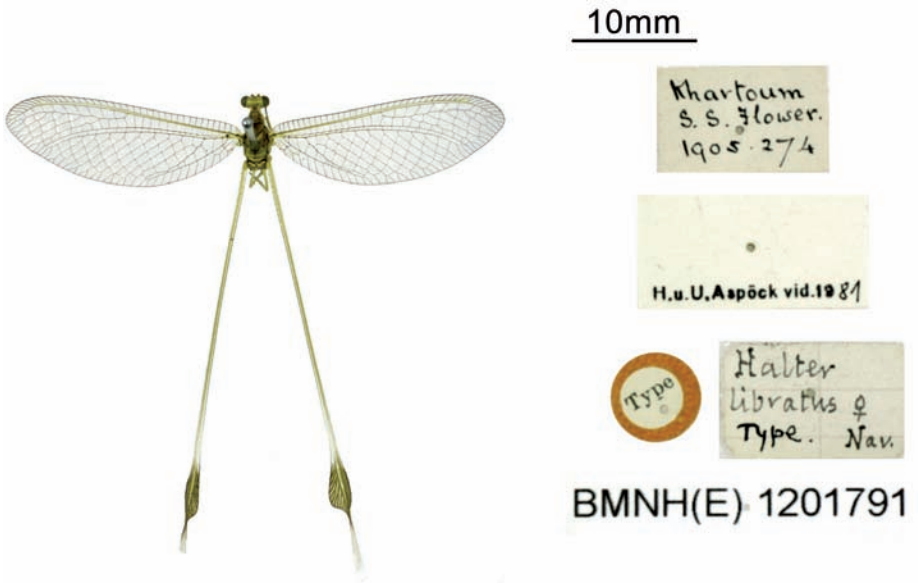
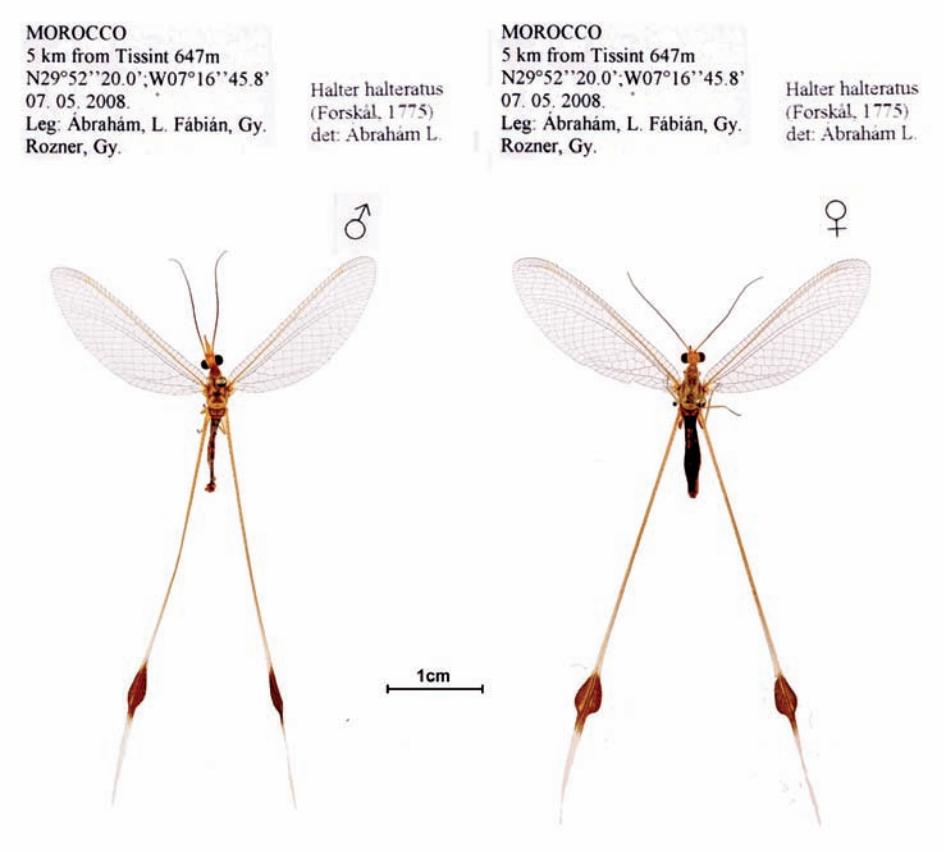


Fig. 3: The type specimen of *Halter libratus* Navás, 1910 preserved in BMNH - The Natural History Museum, London, UK.



Figs. 4-5: Habitus of *Halter halteratus,* Fig. 4: male, Fig. 5: female

Halter halteratus (Figs. 4-5) was described from the Arabian Peninsula (Yemen), but shortly after the description it was misidentified and/or confused with other species several times.

FORSKÅL (1775) published an accurate description and an excellent figure of a male specimen (FORSKÅL & CARSTEN 1776). Their figure (Fig. 1) shows some good morphological characters eg. the eye is large, the antenna is somewhat shorter than the distance between the base of wing and the pterostigma, the forewing is transparent without any patterns and the distal part of the abdomen widening to recognise the species easily.

After the description, the species was firstly mentioned by FABRICIUS (1781, 1787) in his monographs. Later, GMELIN (1788) gave a one-sentence long characterization based on the work of FABRICIUS (1787). Both authors considered *Halter halteratus* as a very similar relative of *Nemoptera coa* (Linnaeus, 1758) and regarded it as an eastern variety of *Nemoptera coa* with colourless forewing.

FABRICIUS (1798) published a new record from Morocco, which is the western part of the present known distribution of *Halter halteratus*. According to MÉNEVILLE-GUÉRIN (1829-1858), FABRICIUS (1798) confused the Moroccan specimen with *Lertha extensa* (Olivier, 1811). Although *Lertha extensa* is known only in the eastern part of

Mediterranean but a similar and later described species, *Lertha barbara* (Klug, 1836) lives in the western part of North Africa, so FABRICIUS (1798) characterized the later mentioned species as it is commented by MONSERRAT (1988).

At the end of the 18th century, OLIVIER (1797) republished the same figure (Fig. 1) drawn by FORSKÅL & CARSTEN (1776), and OLIVIER (1811)) established a new combination: *Nemoptera halterata* (Forskål, 1775). A new characterization of the species was also given by him but specimen was misidentified. This misidentification was pointed out when the specimen was sent to Klug (HAGEN 1886). Consequently, *Nemoptera costata* Klug, 1836 became an objective replacement name for *Nemoptera halterata* sensu Olivier, 1811.

When KLUG (1836) realized that *Nemoptera halterata* was incorrectly identified by OLIVIER (1811) he also synonymed *Nemoptera pallida* Olivier, 1811 from Baghdad to *Halter halteratus*.

In the middle of the 19th century, RAMBUR (1842) still redescribed *Nemoptera pallida* Olivier, 1811 including the sexual dimorphism. The specimens examined by RAMBUR (1942) were collected by Olivier near Baghdad. RAMBUR (1842) also published an unsatisfíctory quality figure on the female specimen (RAMBUR 1842, pl. 8. fig. 4), as it commented by HAGEN (1886).

In the first half of the 19th century, those species [eg. DUMÉRIL (1823) - *Lertha extensa*; BLANCHARD (1840) - *Savignyella costata*; HAGEN (1866) - *Nemoptera sinuata* var.; KLUG (1836) - *Nemopterella africana* (Leach, 1815)] resembling to *Nemoptera halterata* were time by time misidentified. For these misidentifications KLUG (1836), MÉNEVILLE-GUÉRIN (1829-1858), HAGEN (1886) and KIRBY (1900) called the attention.

At the same time, the descriptions of two new species (*Nematoptera forskalli* Westwood, 1841, *Nematoptera olivierii* Westwood, 1841) also caused additional nomenclatural problems.

Nematoptera forskalli Westwood, 1841 was a synonym of *Halter halteratus* (Forskål, 1775), which was firstly revealed by HAGEN (1866) and later by NAVÁS (1910). Probably, WESTWOOD (1841) described an other species because FABRICIUS (1781, 1787, 1798), OLIVIER (1811) and DUMÉRIL (1823) also misidentified this species in their works. *Nematoptera olivierii* Westwood, 1841 proved to be a junior synonym of *Savignyella costata* (Klug, 1838) (GÜSTEN 2003).

In the second half of the 19th century SÉLYS LONGCHAMPS (1866) figured a male specimen of *Halter halteratus* correctly. In the same year, HAGEN (1866) collected and published all synonyms and misidentified species which relating to *Halter halteratus*.

At the beginning of the 20th century there was so high number of incorrect information on *Halter halteratus* that KIRBY (1900) did not list them any more.

The first comprehensive revision of the family was published by NAVÁS (1910). This monograph summarized both significant taxonomical features and nomenclatural data as well as the known distribution. Soon after, he also compiled a key for these taxa (NAVÁS 1912a). Nevertheless, the correct identification of *Halter halteratus* remained uncertain during the 20th century.

Based on the present knowledge of the distribution, the faunistical data need revision (eg. Sierra Leone - WALKER (1853); Oman - NAVÁS (1910), WHITTINGTON (2002); Syria - WALKER (1853), NAVÁS (1912a), AUBER (1955); Iran - NAVÁS (1927), AUBER (1955); India - NEEDHAM (1909), GHOSH (1977), GHOSH & SEN (1977); Israel - SIMON (1983); Pakistan and the United Arab Emirates (as Trucial States) - WHITTINGTON (2002)).

Besides from the description of *Halter libratus* Navás, 1910, there is no more published information on the distribution of this species. HÖLZEL (1999) supposed that it was a synonym of *Halter halteratus* (Forskål, 1775). Although, NAVÁS (1910) listed five dif-

ferences between the two species but all of them seemed merely to be a colour variety. Thus, I checked the type female specimen in the Natural History Museum in London and confirmed that it was a new junior synonym of *Halter halteratus* (Forskål, 1775).

General distribution:

Asia: Yemen - FORSKÅL 1775, FABRICIUS 1781, MEINANDER 1980, HÖLZEL 1999, ASPÖCK et al. 2001, MONSERRAT 2008; Saudi Arabia - KIRBY 1900, NAVÁS 1912a, AUBER 1955, MEINANDER 1980, HÖLZEL 1999, ASPÖCK et al. 2001, MONSERRAT 2008; Kuwait - MEINANDER 1980, HÖLZEL 1999, ASPÖCK et al. 2001, MONSERRAT 2008; Iraq - WALKER 1853, KIRBY (1900), MORTON (1921), WHITTINGTON (2002).

Africa: Morocco - MONSERRAT et al. 1990, ASPÖCK & HÖLZEL 1996, HÖLZEL 1999, ASPÖCK et al. 2001, MONSERRAT 2008; Algeria - RAMBUR 1842, NAVÁS 1913a, ESBEN-PETERSEN 1918, AUBER 1955, ASPÖCK & HÖLZEL 1996, HÖLZEL 1999, ASPÖCK et al. 2001, MONSERRAT 2008; Tunisia - ASPÖCK & HÖLZEL 1996, HÖLZEL 1999, ASPÖCK et al. 2001, MONSERRAT 2008; Egypt - RAMBUR 1842, WALKER 1853, KIRBY 1900, NAVÁS 1912a, AUBER 1955, ASPÖCK & HÖLZEL 1996, HÖLZEL 1999, ASPÖCK et al. 2001, MONSERRAT 2008; Sudan - NAVÁS 1910, HÖLZEL 1999, ASPÖCK et al. 2001, MONSERRAT 2008.

Halter nutans Navás, 1910 (Figs. 6-7).

Type: Pakistan, Quetta BMNH - The Natural History Museum, London, UK – not seen.

Halter nutans Navás, 1910 - NAVÁS 1910 (Odescr), 1912a (Dist), ALEXANDROVA-MARTYNOVA 1930, (Tax, Dist), KIMMINS 1950 (Dist), GHOSH & SEN 1977 (Dist), HÖLZEL 1998 (Dist), 1999 (Dist), ASPÖCK et al. 2001 (Dist), SZIRÁKI 2011 (Dist), CHANDRA & SHARMA ? (Dist)

Halter halteratus (Forskål, 1775) - NAVÁS 1912b (Misid, Dist), HÖLZEL 1968 (Misid, Dist),

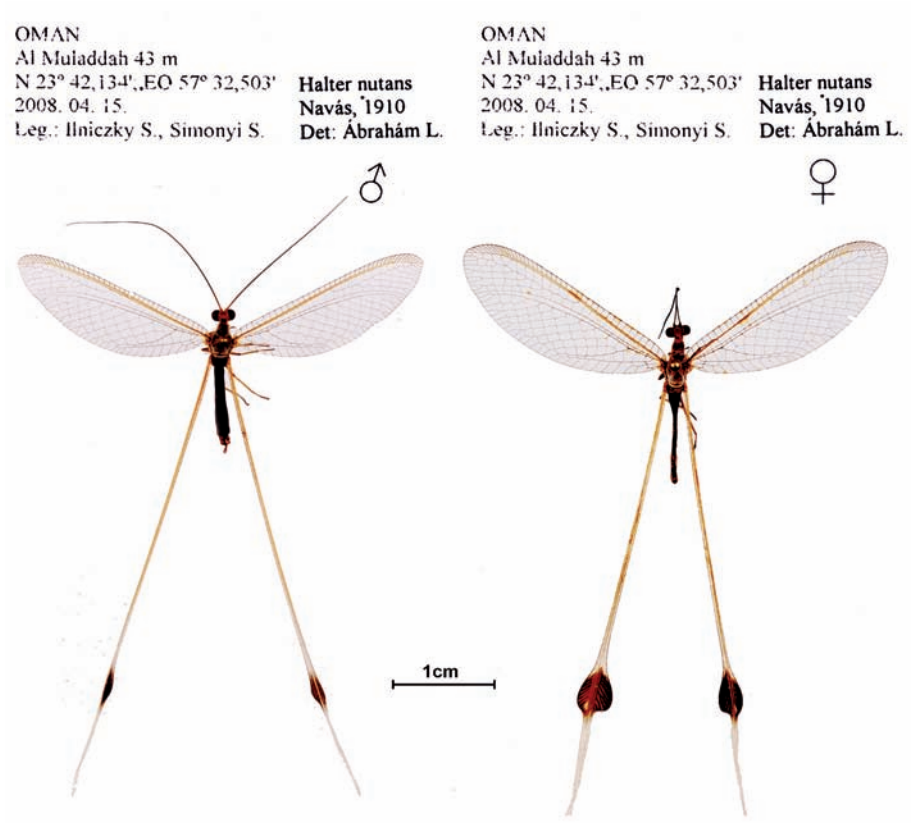
Material examined:

Iran, Heraug 2000.04.18 Leg.: Juhász I. 13♂ 21♀; Iran, Prov. Hormozgan Bandar'e Abbas 20-21.04.2000. leg. L. Damai 1♂ 2♀; Iran, Prov. Hamedan Nevahand 2400m 2000.07.09. Leg.: Hácz T., Kőszegi G. 1♂; Iran, Prov. Hormozgan Dar Gur (Bandare Abbas) 2000.IV.19. leg. Gaskó K. 2♀; Iran, Quir előtt 15km Firuzabad felé szél.: 28-30˚ hossz.:52˚-54˚ 2004.04.12. Leg.: Hácz T., Benedek B.2♂ 1♀; Iran, Prov. Fars Lar 17.04.2000 leg. L. Damai 1♂; Iran, Prov. Färs Mts. Zagros, Lăr, N27˚36,108,1'; E054˚19,656' 880m, IV.29-30.,2009 by light leg. Hácz T., Székely K., Vig K. 2♂ 2♀; Iran, Prov. Fars, Persepolis, Mt Kum, 1200m 2000.V.26.leg. Gaskó K. 2♂ 1♀; Iran, Prov. Markazi, Kavir Desert Houz-e Soltan, 3km S Kusk-e Nosrat 830m, 28.VI.2000. Fábián Gy., Szécsényi L, Székely K. 1♂; Iran, Prov. Yazd Mazra ehye Taqi. 2582m N 31˚ 34,949 E 53˚ 49,387 2005.07.04. Leg.: Ábrahám L. 3♀; Iran, Prov. Esfahan Kuh-e-Karkas, 1600m. 7km NW of Natanz 11-12.06. 2005. Leg.:P. Gyulai & A. Garai 1♂ 1♀; Iran, Prov. Esfahan, Mt.Kühha Qohrud, Vill. Ozvar, 2000.VI.18-19 leg Rozner Gy.1♀; Iran, Prov. Esfahăn, Kuhhă–ye Qohrud, Muteh 2020m N33˚38,0'; E 050˚ 54,1'2012.06.08. Leg.: G. Petrányi, S. Ilniczky 6♂ 1♀; Iran, Prov. Esfahăn, Kuhhă-ye-Qohrud, Qamsar 1770m N 33˚44,3'; E051˚28,7'2012.06.07. Leg.:G. Petrányi, S. Ilniczky 5♂ 3♀; Oman, Thaqib (2km near to Al Ulya) S of Al Alawi N 16˚48,001'; EO 53˚32,834' 2008.04.16. Leg.: Ilniczky S. Simonyi S. 1♂; Oman, Al Muladdah 43m N 23˚42,134'; EO57˚32,503' 2008.04.15. Leg.: Ilniczky S., Simonyi S.7♂22 ♀; Oman, Jabal Ashoor 424 m N17˚ 04;578'.EO 54˚31 ;639'2008. 04. 26. Leg.: Ilniczky S . Simonyi S 1♂ 1♀.

Deposited in the entomological collection of Museum Kaposvár (Hungary).

Remarks: NAVÁS (1910) published the first comprehensive monograph on Nemopteridae in which he described *Halter nutans* Navás, 1910 but the type locality was misquoted as Quetta from the southern part of Africa.

Later, ALEXANDROVA-MARTYNOVA (1930) corrected the geographical position of the type locality and gave some new records from Iran (Baluchistan). Baluchistan is situated in the territory of South East Iran, South Afghanistan and South West Pakistan.



Figs. 6-7: Habitus of *Halter nutans,* Fig. 6: male, Fig. 7: female

General distribution:

Asia: Iraq - KIMMINS 1950, HÖLZEL 1968, 1999, Oman - HÖLZEL 1999, Afghanistan - HÖLZEL 1968, 1999, Iran - ALEXANDROVA-MARTYNOVA 1930, KIMMINS 1950, HÖLZEL 1968, 1999, Pakistan - NAVÁS 1910, KIMMINS 1950, HÖLZEL 1999, ASPÖCK et al. 2001, the United Arab Emirates - SZIRÁKI 2011, India - KIMMINS 1950, GHOSH & SEN 1977, CHANDRA & SHARMA (?).

Halter albostigma (Westwood, 1874)

Nemoptera albo-stigma [sic] Westwood, 1874 - WESTWOOD 1874 (Odescr)

Halter albostigma (Westwood, 1874) – NAVÁS 1910 (K, Dist), 1912a (Dist), 1914 (Redescr), TJEDER 1967 (K)

Material examined:

The type specimen of *Halter albostigma* (Westwood, 1874) preserved in Hope-Westwood Entomological Collections, Oxford University, UK. (Fig. 8)

The type label information: white label: // Type: Neur. No. 31/ Nemoptera / albo-stigma / Westwood [with unknown handwriting] / Hope Dept. Oxford //; white label: // Halter / albostigma Westw. // [with Navás's handwriting] / Long. Navás det. //; white label: // Zulu? / Stevens 1866 2s. // [with unknown handwriting].

Type condition: good, tip of abdomen broken, glued to a white label.

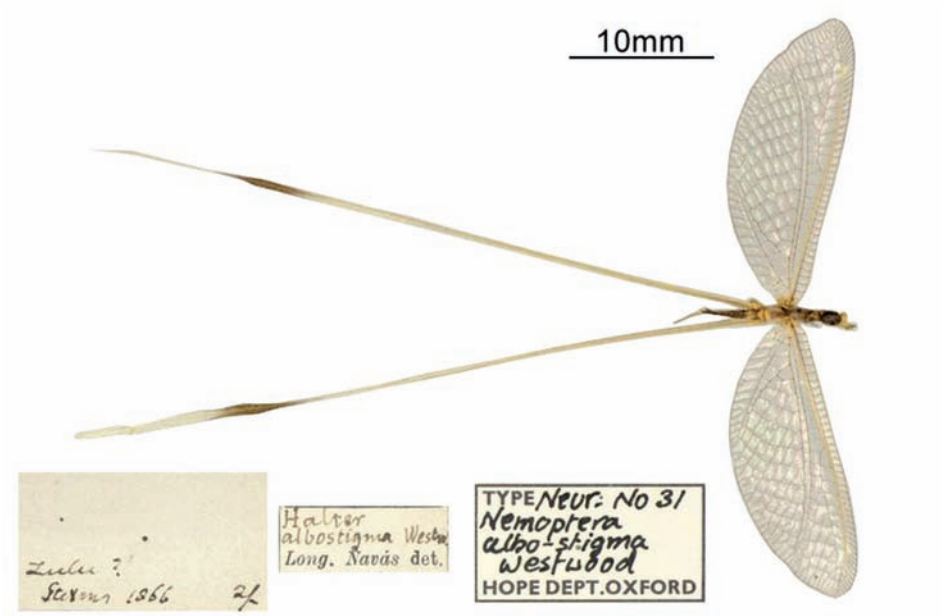


Fig. 8: The type specimen of *Halter albostigma* (Westwood, 1874) preserved in Hope-Westwood Entomological Collections, Oxford University, UK

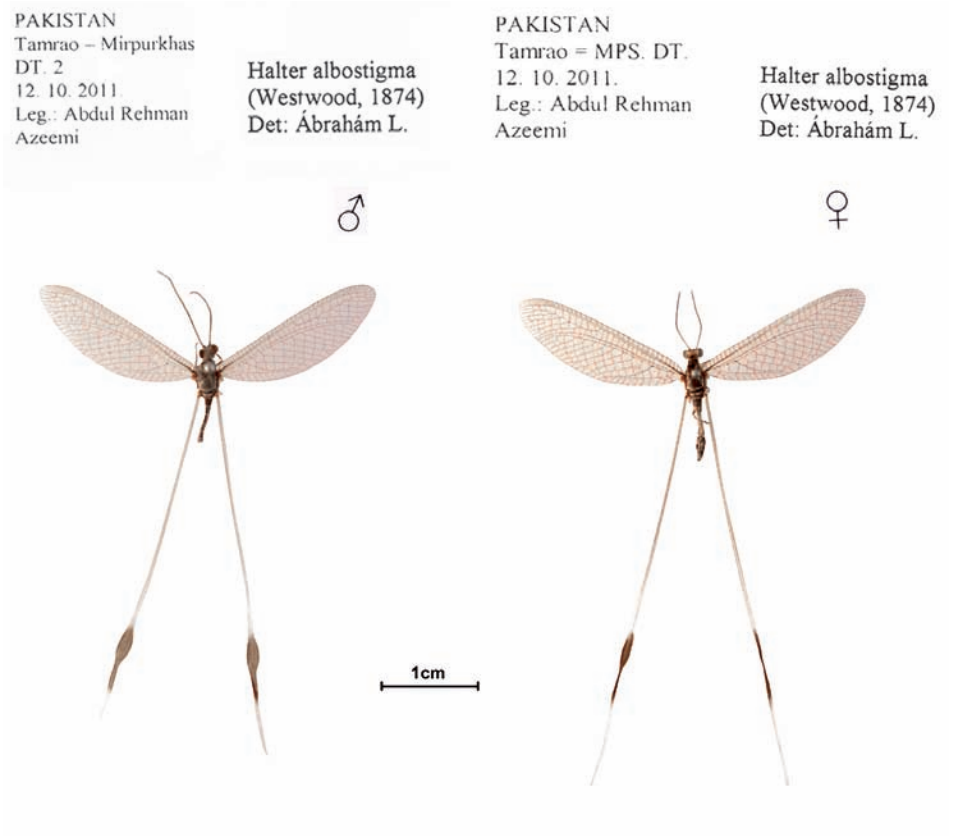
Additional non types: Pakistan Tamrao MPS [Mirpur Khas] DT 12.10. 2011 leg. Abdul Rahman Azeemi 1♂ 2♀; Pakistan Tamrao Mirpurkhas DT2 12.10. 2011 leg. Abdul Rahman Azeemi 1♂ 1♀; Pakistan Tamrao Mirpurkhas DT2 13.10. 2011 leg. Abdul Rahman Azeemi 2♀; Pakistan Thar 14.10. 2011 leg. Abdul Rahman Azeemi 1♂ 5♀; Pakistan Islamkot 28. 10. 2011 leg. Abdul Rahman Azeemi 1♀
Deposited in the entomological collection of Museum Kaposvár (Hungary); and in John O'Dell's private entomological collection in Newport, UK.

Redescription (Figs. 9-10).

Head: Vertex pale yellow, somewhat narrower than width of eye. Frons, occiput and postocular part pale yellow. Clypeus and labrum pale yellow, clypeus 1.5 times longer than labrum. Mouth part pale yellow except last light brown labial segment. Head capsule hairless. Scape, pedicel and basal part of flagellum pale yellow. Distal part of scape with indistinct narrow and brown ring. Flagellum with very short and dark brown setae. Last segment of flagellum acute. Antenna 12 mm long, not reach pterostigma.

Thorax: Pronotum pale yellow with wide longitudinal brown band. Indistinct pale yellow pattern in brown band of pronotum. Pronotal margins with sparse short and white hairs. Mesonotum pale yellow with wide brown central band and two wide brown lateral bands and with sparse short and white hairs. Metanotum pale yellow with sparse short and white hairs. Sides pale yellow with sparse short and white hairs.

Legs: Yellow with short stiff brown hairs. Tibiae longer than femora. Tarsal segment 1 as long as segment 2-5 combined, segment 5 as long as segment 2-4 combined. Basal part of claws shiny yellow distal part shiny reddish brown.



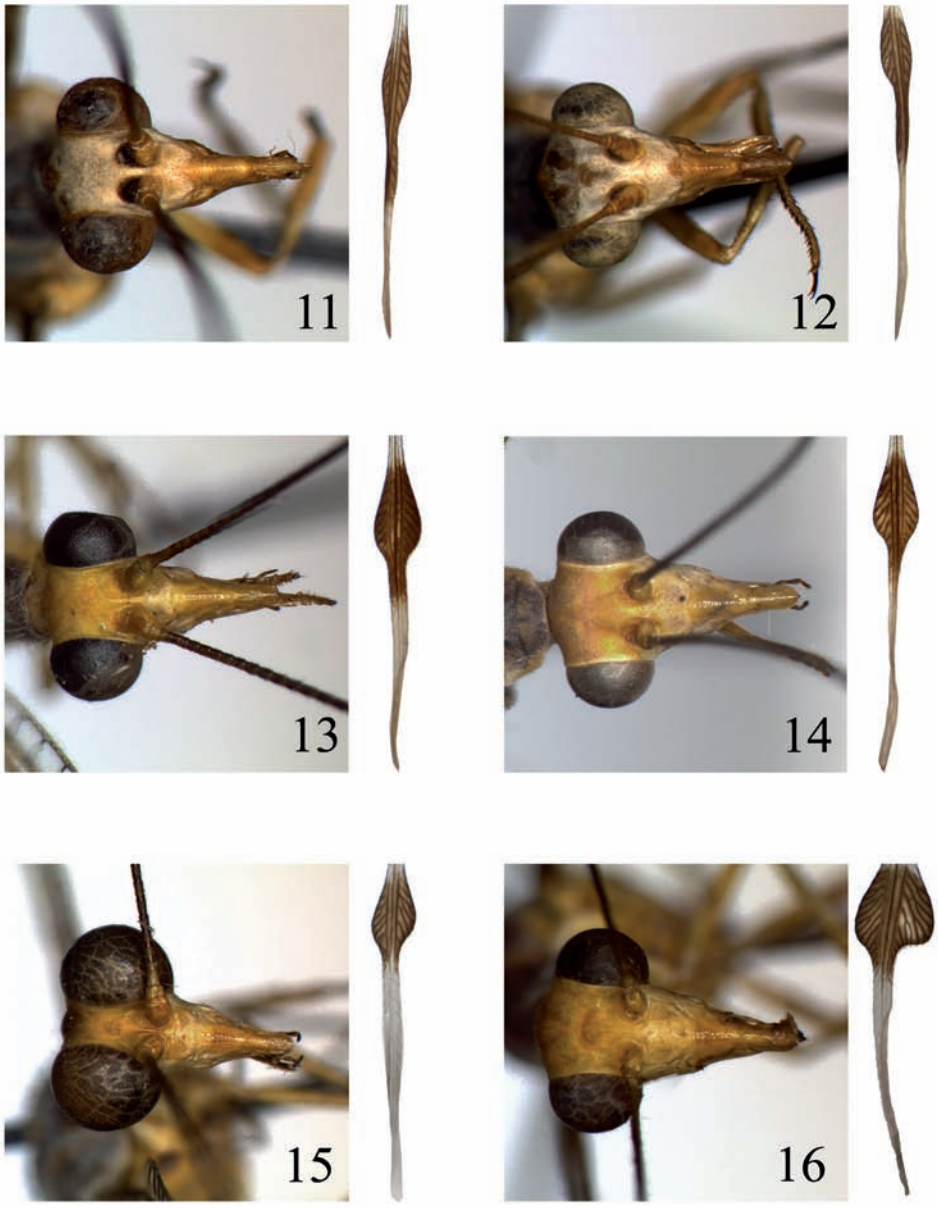
Figs. 9-10: Habitus of male *Halter albostigma,* Fig. 9: male, Fig. 10: female

Wings: Forewing 18 mm long and 5 mm wide. Membrane transparent, subcostal cell yellowish white. C pale with dense short smoothing and brown setae. Sc pale with small brown spots at base on each costal cross-vein proximally. Longitudinal veins pale with small brown dashes at cross-veins. All cross-veins light brown including in costal area. Pterostigma small indistinct yellowish white. 10-11 cross-veins between R and M, before Rs. 12 cross-veins between R and Rs. Hindwing: 37 mm long. Longitudinal veins pale yellow, R yellowish brown in basal part, cross-veins brownish. Dilation narrow with one pale brown cross-band in membrane. Pale brown cross-band in membrane as long as yellowish white apical part of hindwing.

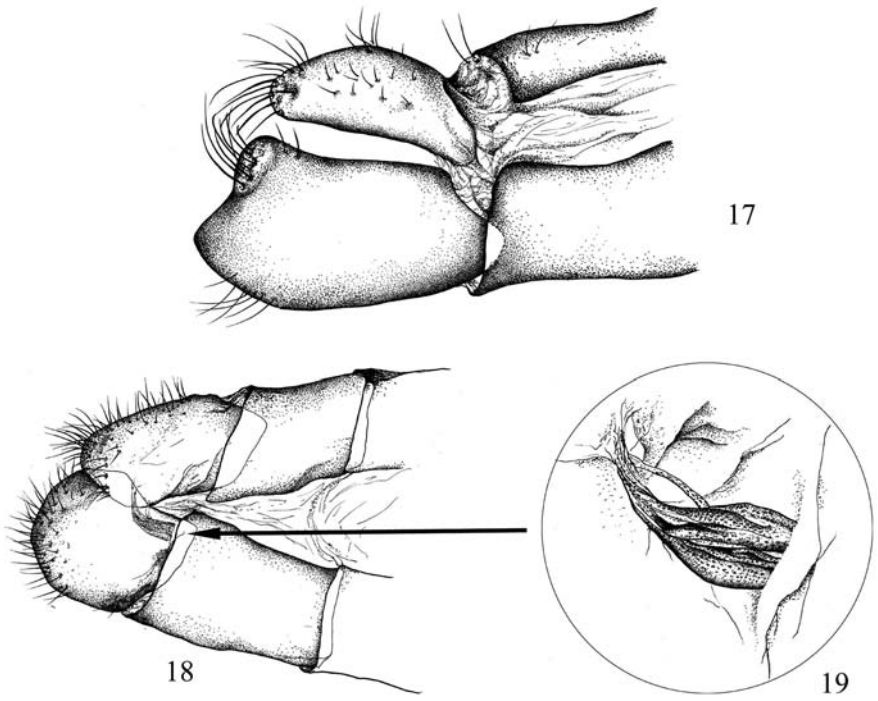
Abdomen: Tergites yellow with central narrow brown line and lateral wide brown bands. Sternites yellow. Abdominal segments with sparse smoothing and white hairs.

Genitalia: Male. Ectoproct elongate with rounded apex and medium long brown hairs. Sternite 9 1.5x longer than wide with long white hairs but subacute lateral corners with long brown hairs, distal margin straight. Apex of abdomen as in Fig. 17 in lateral view. Gonarcus and parameres as in Fig. 22 in caudal view and as in Fig. 23 in lateral view.

Female. Both ectoproct and lateral gonapophyses oval with brown hairs distally as in Fig. 18 in lateral view. A sclerotized brush-like structure on each side below ectoproct as in Fig. 19 in lateral view. Spermatheca elongate sligthly chitinised.



Figs. 11-16: Head in frontal view and terminal part of hind wing; Fig. 11: *Halter halteratus* male, Fig. 12: *Halter halteratus* female, Fig. 13: *Halter albostigma* male, Fig. 14: *Halter albostigma* female, Fig. 15: *Halter nutans* male, Fig. 16: *Halter nutans* female



Figs. 17-19: Genitalia of *Halter albostigma* in lateral view; Fig. 17: Male genitalia, Fig. 18: Female genitalia, Fig. 19: Part of female genitalia (magnified)

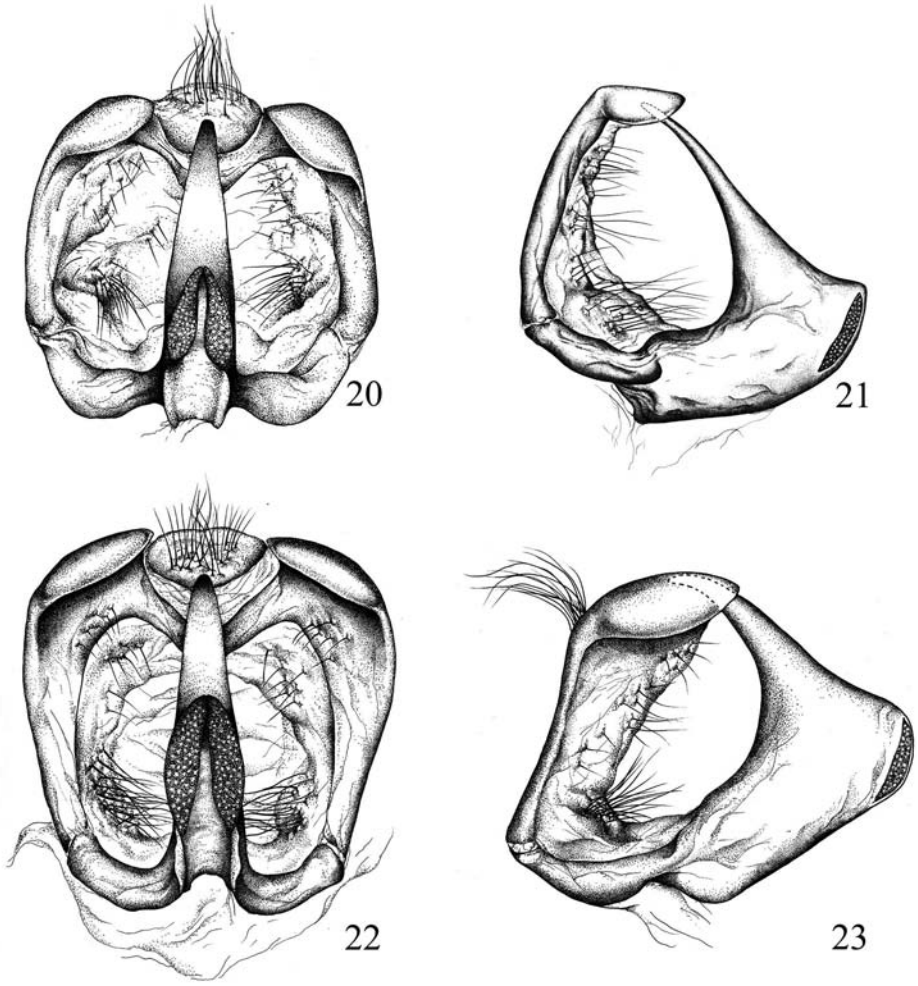
Remarks: Except for its description (Westwood 1874), there was no other information about the species in the literatures. Studying the type specimen and its label, TJEDER (1967) supposed the type locality Zululand (a district of KwaZulu-Natal, South Africa) was incorrect since all *Halter* species spread in North Africa and Middle East. The label information "Zulu?/Stevens 1866 2/" means the specimen was bought in an auction for 2 shillings and the presence of a question-mark after refers for the uncertain locality.

The morphology of the examined additional non type material from Pakistan agrees with the type preserved in the Hope-Westwood Entomological Collections, Oxford in every respect.

The checklist of India (GHOSH & SEN 1977) and the another one which has recently been compiled by CHANDRA & SHARMA (?) mentioned the co-existence of both species namely, *Halter halteratus* and *Halter nutans*. Probably, the distribution data of *Halter halteratus* refers to *Halter albostigma*. Both species fly during the first half of the year, from spring to mid-summer (MEINANDER 1980, HÖLZEL 1999, SZIRÁKI 2011), the flying period depends on the altitude in the Western Palearctic mountainous areas. The seasonal activity of *Halter albostigma* ranges from Autumn to Spring.

General distribution:

The type material was mislabelled, probably that was collected in the former colony of Great Britain. Now, these territories belong to Pakistan (Sindh, Punjub) and India (Gujarat, Rajasthan).



Figs. 20-23: Male inner genitalia Gonarcus and parameres complex in caudal view and lateral view; Figs. 20-21: *Halter halteratus*, Figs. 22-23: *Halter albostigma*

Table 1. The comparative matrix for separating the species

Characters	*H. halteratus*	*H. nutans*	*H. albostigma*
length of male antenna	almost reach to pterostigma	longer than the distance of base and pterostigma	shorter than the distance of base and pterostigma
length of female antenna	reach to the origin of Rs	as long as 2/3 the base and and pterostigma	Reach to the origin of Rs
eye size	normal	large	normal
distance between eyes	at least 1.5x longer than diameter of eye	shorter than diameter of eye	at least 1.5x longer than diameter of eye
branches in Rs	5	6	4
No of cross-veins before Rs	12-13	12-13	10-13
apex of FW	rounded	slightly rounded	rounded
dilation of male HW	medium	medium	narrow
dilation of female HW	medium	wide	narrow
proportion of preapical brown part and apical white part	preapical brown part slightly longer than apical white part	preapical brown part at least 2x shorter than apical white part	preapical brown part as long as apical white part
distribution	N Africa, Arabia	Iraq, E Arabia, W India	SE Pakistan, W India

Fig. 24: The type specimen of *Eretmoptera neglecta* Navás, 1910

Appendix for Asiatic Nemopteridae

So far, only two species of Nemopterinae are known, namely *Eretmoptera neglecta* Navás, 1910 (Fig. 24) and *Nemopistha sinica* C.-k. Yang, 1986 (Fig. 25) in the Oriental realm (India, South China).

According to TJEDER (1967) *Eretmoptera neglecta* was supposed to be a synonym of *Eretmoptera biremis* (Kolbe, 1900) but he did not find the type material in the Paris Museum (Muséum National d'Histoire Naturelle, Paris, France).

Earlier, NAVÁS (1912a) also synonymed his own described species to *Nemopterella biremis* (Kolbe, 1900) so TJEDER (1967) moved this species to a new combination as *Barbibucca biremis* (Kolbe, 1900).

The type specimen of *Eretmoptera neglecta* Navás, 1910 has been recently found, so the status of the type could be checked. The type specimen is characterized with haired head and partly hairy antennae which featured the genus *Barbibucca* Tjeder, 1967. The species is characterized with yellowish brown spots between the costals and pale beyond the pterostigma in the costal area of the forewing.

Fig. 25: The type specimen of *Nemopistha sinica* C.-k. Yang, 1986

Label information: white label with red letters //Type//; white label: // Eretmoptera / neglecta / Nav. // [with Navás's handwriting], white label: // Nemopterella / biremis ? Kolbe. Cap? [with Navás's handwriting] / Login Navás det. //; white label: // Eretmoptera / neglecta Nav. /type / [with unknown handwriting] /Login Navás det. 1910 //, white label: // Museum Paris //
Type condition is medium, the left antenna lost.

Remarks: The type specimen can not be collected in India as it was mentioned by NAVÁS (1910) in the original description since all known specimens and also the type of *Barbibucca biremis* were recorded only in South Africa. NAVÁS (1910) published the type locality to India incorrectly. Checking the type specimen it has not got any label referring to the collecting site.

The other one species of Nemopterinae, *Nemopistha sinica* C.-k. Yang, 1986 was described from China. So far, only the type specimen has been known from South China, Yunnan province (YANG 1986).

It is slightly larger than *Halter* species, the length of forewing 26 mm and that of hindwing 60 mm. Vertex brown with narrow edge next to eye. The basal part of antenna is yellow (distal part broken), its length is unknown. Its eye is rather large, its diameter is 1.5x longer than rostrum.

There are 15-16 cross-veins before Rs. Rs is with 8 branches. Pterostigma is pale yellow. Hypostigmatic cell is about as long as wide. The dilation is narrow and double, preapical brown brand is slightly longer than white apical part in hindwing.

According to the type label the specimen is male but the genitalia probably lost.

Label information: red and white label: // Holotype / male //, white label written in Chinese // Yunnan Prov., / Nuijang Lisu Aut. Pro., / Lushui Co. 880m / 1980-VI-27 //, white label written in Chinese // [?????? with Chinese letters] / Nemopistha / sinica / det. Yang Chikun //
Type is deposited in CAU – China Agricultural University, Beijing, China.

Remarks: The male genitals usually feature the genera. Due to the missing genitalia the valid genus can not be identified but it can not be congeneric with African genus *Nemopistha* Navás, 1910.

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Libelloides cunii (Sélys-Longchamps, 1880) (Neuroptera: Ascalaphidae) new record for Morocco

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Háva, J. & Ábrahám, L.: *Libelloides cunii (Sélys-Longchamps, 1880) (Neuroptera: Ascalaphidae) new record for Morocco.*
Abstract: The species *Libelloides cunii* (Sélys-Longchamps, 1880) is newly recorded from Africa and Morocco.

Keywords: Faunistics, Ascalaphidae, Libelloides, Morocco.

Introduction

The majority of the Ascalaphidae species are relatively large compared to other insect groups. The number of described taxa is about 450 species and subspecies all around the world (Tjeder 1992). According to our knowledge, their distribution is limited to the tropical and dry (desert and semi-desert) areas, where their diversity culminates. Their taxa need revision, since the last significant comprehensive monograph (Weele 1909) was published more than a hundred years ago.

Although, the Ascalaphidae fauna in the western Palearctic is well known (Aspöck et al. 2001) however the first occurrence of an African species, *Ascalaphus festivus* Rambur, 1842 from Europe was recently recorded in Sardinia (Italy) (Pantaleoni et al. 2013). From Morocco, in North Africa, two new species, namely *Cirrops berbericus* Ábrahám, 2010 and *Agadirius trojani* Badano & Pantaleoni, 2012 were recently described (Ábrahám 2010, Badano & Pantaleoni 2012).

In the present paper, we reports the first record of *Libelloides cunii* (Sélys-Longchamps, 1880) from Morocco which is also its first record out of Europe as well.

Material and method

In spring, the material was collected by a net in the High Atlas Mountains. The specimens were given to the first author for identifying and publishing.

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Results and discussion

The genus *Libelloides* recently contains 16 species and subspecies known from the Palaearctic region (ASPÖCK et al. 2001, HÁVA 2000). One species, *Libelloides ictericus* (Charpentier, 1825) was collected from North Africa including Morocco. In the present paper, a new owl-fly species, *Libelloides cunii* (Sélys-Longchamps, 1880) for the Moroccan fauna is reported.

Libelloides cunii (Sélys-Longchamps, 1880) (Fig. 1).

Material examined: Morocco, High Atlas, Tizi-n-Test, 2-4.1995, Jan Macek lgt., 6 specimens, J. Háva det., (4 NMPC, 2 JHAC).

Deposited: NMPC - National Museum, Prague, Czech Republic; JHAC - Private Entomological Laboratory & Collection, Únětice u Prahy, Prague-west, Czech Republic.

Taxonomical status: For a long time, the valid taxonomic status of *Libelloides cunii* has been controversial because it was considered to be a colour variety of *Ascalaphus baeticus* var. *cunii* Sélys-Longchamps, 1880 or subspecies of *Libelloides baeticus* (Rambur, 1838) (ASPÖCK et al. 1980, AISTLEITNER 1980).

Mainly the Spanish entomologists considered *Libelloides cunii* as a valid (NAVÁS 1901, 1912, WEELE 1909, LACROIX 1923, VIDAL & LÓPEZ 1943, BERLAND 1962, MONSERRAT 1985, SÉMÉRIA & BERLAND 1988, ASPÖCK et al. 2001) since this species had only Iberian distribution till now.

Larva: The first schematic figure of the larva was published by NAVÁS (1915) and later the same figure was issued by LACROIX (1923). Finally, WEELE (1909) also illustrated a larva (L1) hatching from an egg which was given by Navás. BADANO & PANTALEONI (2012) did not keyed the larva in the latest comprehensive paper.

Distribution: Due to the only little morphological differences between *Libelloides baeticus* and *Libelloides cunii* and the distribution of the two taxa overlaps, the faunistical data were confused.

After the original description, it was firstly mentioned by WEELE (1909) from Portugal. Later, LACROIX (1923) published a new occurrence from South France beside Spain and Portugal.

Based on LACROIX (1923) the occurrence of the species in southern France was also cited by BERLAND (1962) but other French researchers eg. PUISSÉGUR (1967), DELIRY & FATON (2010) considered its French distribution uncertain.

The records from Portugal (WEELE 1909) are also uncertain, this is why LETARDI et al. (2013) did not publish *Libelloides cunii* in the Portugal checklist. MONTSERRAT et al. (2012) also cite this species only from Spain in the Iberian Peninsula.

Consequently, this species is reliably known from Spain and Morocco which is new record for Africa either.

Acknowledgements

We are really indebted to Jan Macek (NMPC) for loaning the interesting material and making a habitus photo of the species.

Fig. 1: *Libelloides cunii* (Sélys-Longchamps, 1880) from Morocco, High Atlas, Tizi-n-Test

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Magyarország *Cnephasia* fajai (1.) (Lepidoptera: Tortricidae)

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FAZEKAS, I.: *Cnephasia species of Hungary No. I. (Lepidoptera: Tortricidae).*
Abstract: The present study aims to gather all the information available on the diagnosis of *Cnephasia asseclana, C. chrysantheana* species in Hungary, as a starting point for a subsequent paper on the dynamics of distribution limits. The information was mainly derived from lepidopterological collections and faunistic studies. Working with population samples of several taxa one obtains greater variety of information, both qualititative and quantitative. These observations raised at least two problems: (1) it was not possible to report data from localities where two or more species occur sympatrically, and when they could not be positively distinguished by means of morphological characters; (2) in 2010–2014 the author collected museum material from different localities of Hungary; detailed structure of male and female genitalia of several specimens from within the accepted range of nominal Cnephasia was studied, but this provided no quantitative data. Distribution maps of the species show the probable resident distribution area (grey), together with localities from which specimens have actually been examined (black dots). In text of the Hungarian distribution and phenology, detailed information is also included about flight period, biology including foodplants and habitat including the altitude range. Structure of genitalia and morphological characteristics of wings are illustrated with figures. Colour photographs and drawings of adults and genitalia of both sexes are provided for identification of each described species. Ample illustrations of differential features will facilitate identification. At present, 12 Cnephasia species are known from Hungary, and are included in the Checklist, together with the most important synonyms. The study series is intended for both amateurs and professionals as well as for those engaged in applied lepidopterology. With 24 figures.

Keywords: Lepidoptera, Tortricidae, *Cnephasia asseclana*, *C. chrysantheana*, diagnosis, biology, distribution, Hungary.

Bevezetés

Ha áttekintjük KENNEL (1921) hatalmas palearktikus Tortricidae monográfiáját, akkor egyértelműen megállapíthatjuk, hogy a szerző teljesen másképpen látta a *Cnephasia* (= *Tortrix* L.) genus taxonómiáját és nevezéktanát, mint napjainkban. Olykor, a mai értelemben valid fajnév alá 3–5 taxont is besorolt (pl. „*Tortrix wahlbomiana L.*). Sokáig mind a hazai, mind pedig az európai irodalomban Kennel könyve volt a meghatározó, ezért igen nehéz eligazodni a nevek használatában, de főleg a publikációk adathalmazában, hiszen nem tudjuk egzakt módon, hogy az elterjedési-, biológiai adatok pontosan melyik fajra vonatkoznak. SZŐCS (1977) a Lepidoptera aknákról és gubacsokról írt könyvében a *Cnephasia* fajokkal kapcsolatban megállapította, hogy a fajok aknái any-nyira hasonlítanak egymáshoz „*…hogy nem lehet őket egymástól megkülönböztetni, ezért a*

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hernyók kulcsát adjuk meg." Csupán három fajt (*C. incertana, C. asseclana [=virgaureana], C. chrysantheana*) vizsgált, de a pontos irodalmi forrásokat nem adta meg.

A *Cnephasiini*-k kutatásában és azonosításában RAZOWSKI 1959-ben megjelent európai kötete jelentős változásokat hozott, de az új taxonómiai szemlélet csak lassan vert gyökeret a magyar faunisztikában, s a régi irodalmi adatokat senki nem ellenőrizte. Az elmúlt évtizedekben, számos esetben személyesen konzultáltam több hazai molylepke kutatóval, akik elmondták, hogy többnyire úgy jelentették meg publikációikat, hogy a fajok azonosítására csupán KENNEL (1921) vagy HANNEMANN (1961, 1964) könyveinek képtábláit használták. A gyűjteményi revíziók tanúsága szerint genitália vizsgálatokat leginkább PETRICH KÁROLY (1916–2013), szórványosan ÁCS ESZTER (MTM), KUN ANDRÁS (MTM) és SZIRÁKI GYÖRGY (MTM) végzett. Ez a gyakorlat sok pontatlanságot és bizonytalanságot jelent a magyar *Cnephasiini* fauna ismeretében.

Az identifikációs gondok RAZOWSKI (2001) színes képtáblás közép-európai kötetének megjelenése után sem oldódtak meg, hiszen a gyűjtők egy része továbbra is képek alapján határoz, és csak ritkán fordul specialistához segítségéért, hogy egy-egy problémás faj vagy fajcsoport genitália vizsgálatát elvégezze. Ezért tovább konzerválódott a fajok azonosításának problémaköre, s változatlanul bizonytalanok a napjainkban megjelenő magyar tanulmányok fajlistái is. Olyan gyűjteményi anyagokat, s erre alapozott publikációkat (pl. nemzeti parkos kötetek) is találtam, ahol például a *Cnephasia chrysantheana* név alá a következő fajok példányai is be voltak sorolva: *C. stephensiana* (Doubleday, 1849) [3. ábra], *C. asseclana* (Denis & Schiffermüller, 1775), *C. virgaureana* Treitschke, 1835, *C. communana* (Herrich-Schäffer, 1851) [4. ábra].

Bár a *Cnephasia* fajok szárnymintázata nem túl bonyolult, mégis a fajok közötti nagyfokú hasonlóság miatt igen nehéz lenne egyértelmű határozóbélyegeket megnevezni. Nehezíti a szárnyhabitus alapján való fajazonosítást, hogy sokszor a rajzolati elemek (szalagok, foltok) mintázata valósággal összeolvad a szárny alapszínével, s csupán néhány sötétebb pikkelyfolt vagy vonal jelzi a nehezen felismerhető mintázati szegélyeket. A *Cnephasia* fajok elülső szárnymintázatában a következő rajzolati elemek a meghatározóak: a postbazális-, a mediális- és a terminális szalag valamint a subapikális- és a subterminális folt (vö. 5. ábra).

A legbiztosabb specifikus jegyeket a meglehetősen stabil fajjellemzőket hordozó ivarszervi struktúrákban találunk [6. ábra]. Ebből következően a hiteles identifikációt csak a genitáliák vizsgálata adja. A palearktikus és az európai Tortricidae határozókönyvek ivarszervi ábrái tusrajzzal készültek. Többnyire pontosak, de használatuk nagy gyakorlatot igényel. A közel rokon taxonok szétválasztásánál, a részlet struktúrák összehasonlításánál ma már inkább a digitális mikro fotózást és a számítógépes elemzést használjuk.

GOZMÁNY (1968) első molylepke névjegyzékében a „*Cnephasiella*" és a „*Cnephasia*" genus neveket használta, s nyolc fajt mutatott ki Magyarországról. Ma hazánkban 12, Közép-Európában 14 és Európában közel 40 faj él (PASTORÁLIS 2012, RAZOWSKI 2001, 2002). Az európai fajszám bizonytalan, mert néhány faj előfordulása megerősítést igényel, továbbá az újabban leírt taxonok státusza bizonytalan.

A palearktikus *Cnephasia stephensiana* morfológiailag igen variábilis szerte Európában. Hazánkban a Brit-szigetekről leírt nevezéktani alfajhoz nagyon közelállóformák repülnek. Földrajzilag alfajokra tagozódó faj (Kelet-Ázsia, Kis-Ázsia, Marokkó), melyet a hazai gyűjteményekben leginkább a *C. chrysantheana*-val cseréltek fel. A publikációk alapján áttekintetett nagyobb magyar gyűjteményekben (pl. MTM) a *C. chrysantheana* bizonyító példányok jelentős része *C. stephensiana*-nak bizonyult. Ebből következően a korábbi *C. chrysantheana* irodalmi adatokat csak revízió után vehetjük figyelembe a taxonok magyarországi chorológiai térképeinek elkészítésénél.

Jelen munkámmal megkezdem a hazai *Cnephasia* fajok átfogó taxonómiai, biológia és állatföldrajzi vizsgálatát, s térképeken mutatom be az egyes taxonok provizórius elterjedési mintázatát, melyet a későbbi kutatások tovább módosíthatnak. A synonym nevek közül csak azokat tüntetem fel, amelyek a trianoni határokon belül a magyar irodalmakban előfordulnak. A PÁVEL és UHRYK (1896) a mai értelembe vett *Cnephasia* fajokat az ún. „*Sciaphila* Tr. subgenusba sorolta be, s az általuk használt „*Wahlbomiana* L." név a *Pseudosciaphila branderiana* (Linnaeus, 1758) synonymja. A „*nubilana* HB" név pedig a *Neosphaleroptera nubilana* (Hübner, [1799]) fajra vonatkozik.

Anyag és módszer

Nagyobb sorozat különböző *Cnephasia* fajnév alá besorolt példány került felboncolásra annak eldöntésére, hogy mely példányok, melyik taxonhoz tartoznak. A vizsgált példányok, s az elkészített genitális preparátumok jelentős része a Magyar Természettudományi Múzeumban (Budapest) és részben a Jász Múzeumban valamint a komlói Regiograf Intézetben vannak elhelyezve, euparalban. Azért, hogy az ivarszervek térszerkezetét a későbbiekben is tanulmányozni lehessen, a vizsgálati anyag néhány példányának genitáliáját 97%-os glicerinben tartósítva, műanyag csőben, a rovartűre tűztem (lásd 0. ábra). Az imágók képei Zeiss sztereo mikroszkópra szerelt BMS tCam 3,0 MP digitális kamerával készültek, a ScopePhoto 3.0.12 szoftver segítségével. A genitális fotókat a Scopium XSP-151-T-Led biológia mikroszkóppal és a számítógéphez csatlakoztatott MicroQ 3.0 MP digitális kamerával készítettem 20x-os és 50x-es nagyítással. Az így elkészített habitus és preparátum fotókat a Corel Draw és Photoshop programokkal elemeztem. A térképezés során többféle adatgyűjtést végeztem: geokoordinátás (= ponttérképezés), folt-térképezés, földrajzi(hely) nevek szerint, UTM hálórendszer szerint. Az igen heterogén adatsorok alapján készítettem el a fajok provizórikus magyarországi elterjedési térképét.

Rövidítések a szövegben: MTM= Magyar Természettudományi Múzeum, Budapest; RI= Regiograf Intézet, Komló.

Eredmények

Cnephasia asseclana ([Denis & Schiffermüller], 1975) [1. ábra – Fig. 1.]

Tortrix asseclana ([Denis & Schiffermüller], 1975, Ank. Verz. Schmett, Wienergegend, p. 131. Locus typicus: „Austria".

Synonyma: *Tortrix interjectana* Haworth, [1811]; *Sciaphila virgaureana* Treitschke, 1835; *Tortrix oleraceana* Gibson, 1916.

Irodalom: Ács & Szabóky 1993, Buschmann 2004, 2012, Fazekas 1993, Pastorális & Szeőke 2011, Szőcs 1977.

Diagnózis: A szárnyak fesztávolsága: 13–19 mm. Alapszíne sötét vagy világosabb barnásszürke, a keresztszalagok többnyire markánsak, szegélyükön a fekete pontsor rendszerint éles. A hátulsó szárny barnásszürke, a tőnél világosabb.

Hím genitália: az uncus közepesen hosszú, a gnathos karokat összekapcsoló lemez korong alakú, a juxta v-alakú nyúlványai karcsúak, széttartanak. A valva apexe enyhén kihúzott, a sacculus erőteljes, a végén ecsetszerű. Az aedeagus tömzsi és rövid [7. ábra].

Nőstény genitália: A papilla analis kerekded, a colliculum nagy és kehelyforma. A sterigma fejlett, széles. A corpus bursae tyúktojás alakú, a signum distálisan kiszélesedett (13., 17. ábra).

Bionómia: A imágók júniustól augusztusig egy nemzedékben repülnek, réteken, mezőgazdasági területeken, házi kertekben, legelőkön, mezsgyéken, ligetekben, erdőszéleken, főleg dombsági és középhegységi tájakon vagy szórványosan alföldi homokterületeken. SZŐCS (1977, p. 12. [= *Cnephasia virgaureana* TR.) szerint a sötét-zöld színű, barna fejű, polifág hernyók áprilistól májusig aknáznak, s „…*a tűlevelüeket kivéve minden virágos növényen előfordulhatnak*." Az első stádiumban lévő hernyó áttelel. Az irodalomban több mint 200 tápnövénye ismert: *Chrysanthemum*-, *Ranunculus*-, *Rumex*-, *Plantago*-, *Papaver*-, *Humulus*-, *Mentha* fajok (RAZOWSKI 2002) stb. A kertészetekben károsíthatja a paradicsomot, a káposzta-féléket, a borsót, sőt a földiepret is. Kezdetben a levelekben aknázó lárvák később a virágokat is megtámadják.

Magyarországi elterjedése: Irodalmi adatok: – ÁCS & SZABÓKY (1993): Bükk (Cserépfalu); – BUSCHMANN (2004): Mátra (Mátrafüred, Sár-hegy); – FAZEKAS (1993): Balaton-medence (Tihany); – PASTORÁLIS & SZEŐKE (2011): Vértes (Csákberény, Öreghegy, Söréd); – SZŐCS (1977): Dunántúli-középhegység (Budapest környéke), Alpokalja (Szakonyfalu), Dunántúli-középhegység (Pannonhalma) (24. ábra).

Új adatok: ♀, H-Komló, Zobákpuszta, 1993.06.10., leg. et gen. prep. Fazekas I., No. 2819. (in coll. RI); 2 ♂, Sopronhorpács, 1959.05.23. et 26., leg. fénycsapda [light trap]; ♂, Pilis-tető, 1981.06.16., „coll. Issekutz", gen. prep. Sziráki Gy., No. 163., (in coll. MTM); ♀, Jászberény, újerdői homokterület, 1999.06.12. leg. et coll. Buschmann F., gen. prep. Fazekas I., No. 3383.

Földrajzi elterjedése: Holarktikus faj. Ismert Észak-Amerikában, Eurázsiában egészen a Brit-szigetekig valamint Új-Foundlandon és a Kanári-szigeteken.

Jegyzet: SZŐCS (1977) hazánkban ritka fajnak tekinti. Az eddig publikált és megvizsgált példányok lelőhelyei döntően a Dunántúl északi részén és az Északi-középhegységben vannak, csak 1-2 lelőhely ismert a Dél-Dunántúlon és az Alföldön. A *C. asseclana* példányokat többször besorolják a *C. chrysantheana* név alá, így sok adat bizonytalan.

Cnephasia chrysantheana (Duponchel, 1843) [2. ábra – Fig. 2.]

Sciaphila chrysantheana Duponchel, 1843, Hist. nat. Lépid. Papilons Fr., Suppl., 4: 410, pl. 83, fig. 5. Locus typicus: „France".

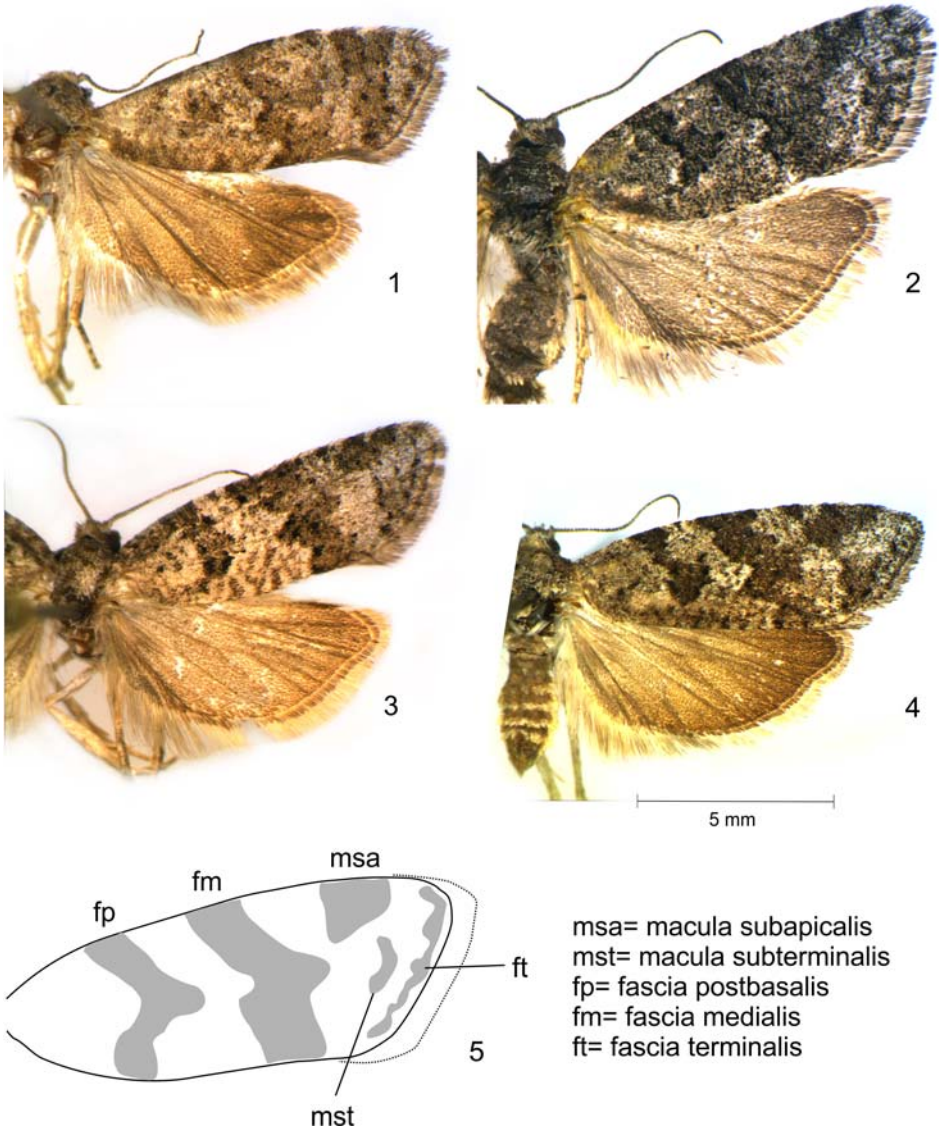
Synonyma: *Cnephasia cinareana* Chrétien, 1892; *Cnephasia directana* Réal, 1953; *Cnephasia pulmonaria* Réal, 1953.

Irodalom: Ács et al. 1990, Ács & Szabóky 1993, Balogh 1978, Buschmann 2004, Fazekas 2002, Gozmány & Szabóky 1986, Pastorális & Szeőke 2011, Razowski 2001, 2002, Sziráki 1980, Szabóky 1999, Szőcs 1977.

Diagnózis: A szárnyak fesztávolsága: 17–26 mm. Alapszíne barnásszürke, nagyon változékony, sötét és igen világos szárnymintázatú példányokat is ismerünk, sőt egyszínű példányok is előkerültek. A posztbazális szalag a costa vonalával 55–57 fokot zár be, s a sejtben a mediális szalag irányába fogszerűen kinyúlik. A mediális szalag costával bezárt szöge 70–72 fokos, lényegesen szélesebb, mint a posztbazális szalag, s a szubapikális folttal összekapcsolódik. A szubterminális folt kettő vagy három részre tagozódik. A hátulsó szárny barnásszürke, a rojt tővonala sötét.

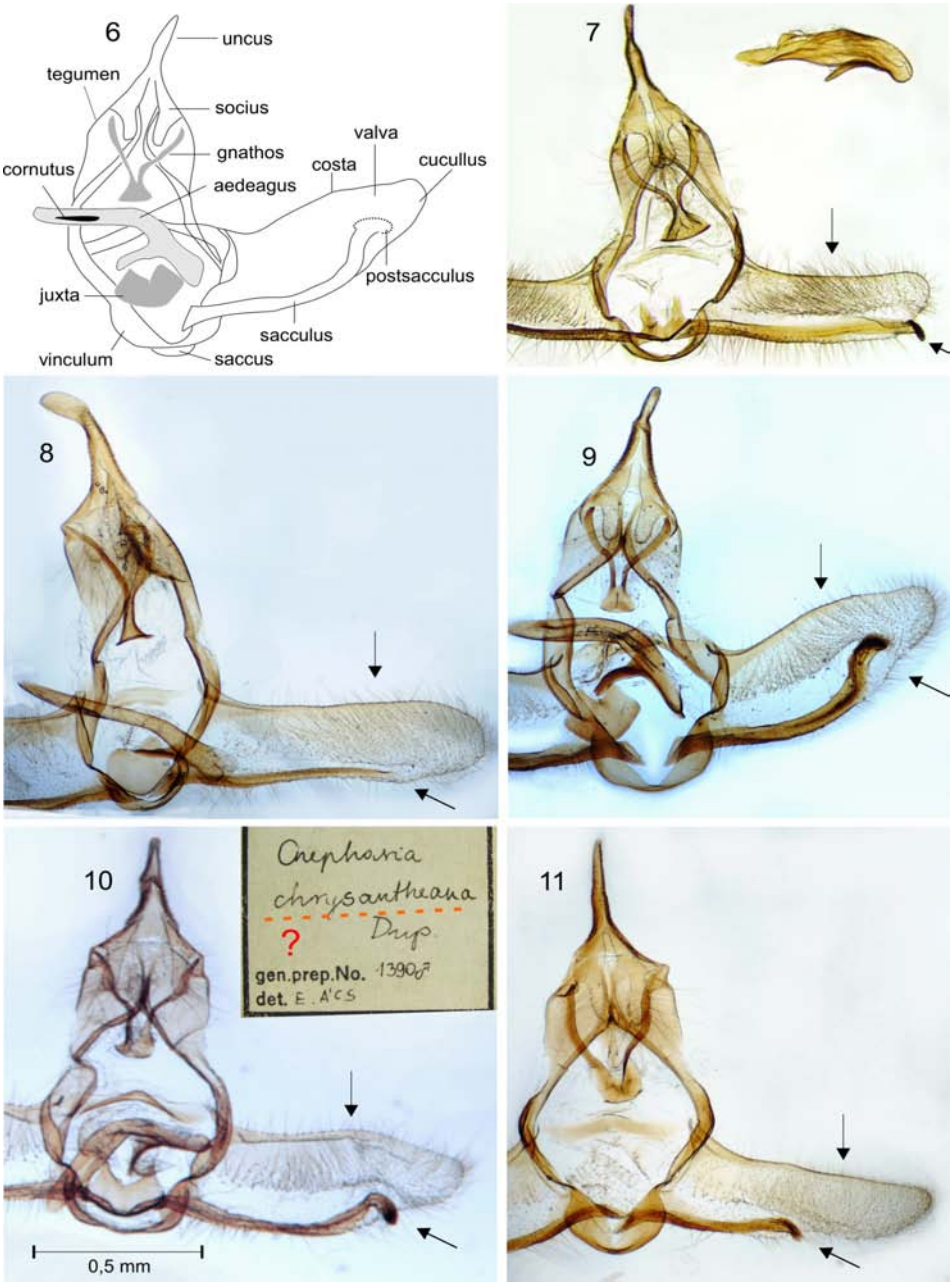
Hím genitália: A valva lemeze nyújtott, a sacculus keskeny, egyenes; a pajzs alakú juxta nyúlványai aprók; az aedeagus hosszú és vékony, enyhén ívelt (8. ábra).

Nőstény genitália: A papilla analis kissé nyújtott, az ostium bursae-hoz kapcsolódó sterigma kettéosztott és késpenge alakú, a colliculum keskeny, enyhén szklerotizált. A corpus bursae nyújtott, a signum tüskemezője hosszú és keskeny (14., 18. ábra).



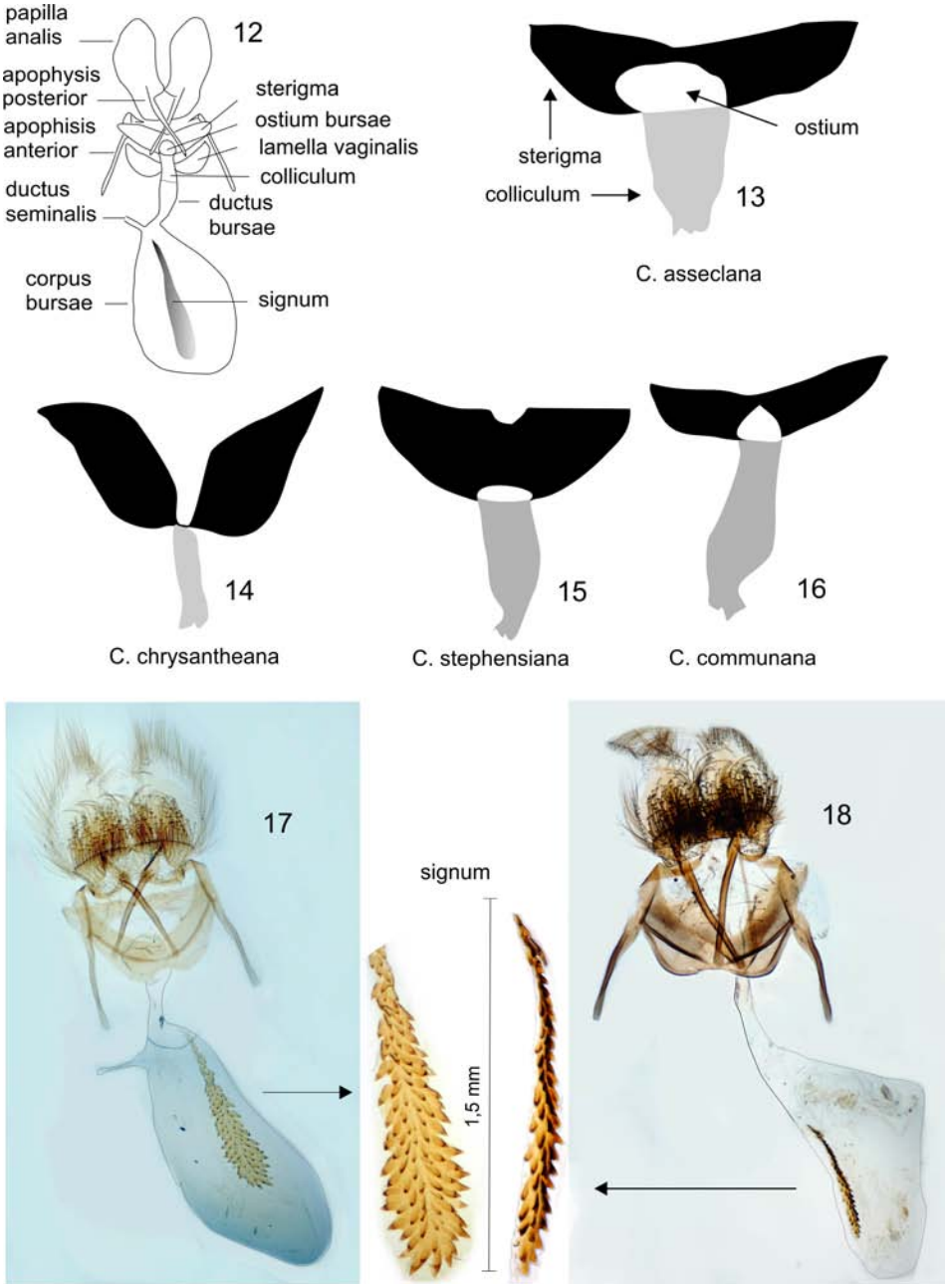
1–5. ábra: A *Cnephasia* fajok habitusképe; 1) *C. asseclana* (Komló), 2) *C. chrysantheana* (Nagyharsány), 3. *C. stephensiana* (Sukoró), 4) *C. communana* (Kárász), 5) az elülső szárny főbb rajzolati elemei

Fig. 1–5: Adults of *Cnephasia* spp; 1) *C. asseclana* (Komló), 2) *C. chrysantheana* (Nagyharsány), 3. *C. stephensiana* (Sukoró), 4) *C. communana* (Kárász), 5) forewing patterns of *Cnephasia* moths, diagram



6–11. ábra: A *Cnephasia* fajok hím ivarszerve; 6) a strukturális elemek terminológiája, 7) *C. asseclana* (Sopronhorpács), 8) *C. chrysantheana* (Tihany), 9) *C. stephensiana* (Kárász), 10) *C. stephensiana* (Cserépfalu), 11) *C. communana* (Zengővárkony)

Fig. 6–11: Male genitalia of *Cnephasia* spp.; 6) terminology of genitalia, 7) *C. asseclana* (Sopronhorpács), 8) *C. chrysantheana* (Tihany), 9) *C. stephensiana* (Kárász), 10) *C. stephensiana* (Cserépfalu), 11) *C. communana* (Zengővárkony)



12–18. ábra: A *Cnephasia* fajok nőstény ivarszerve; 12) strukturális elemek terminológiája, 13–16) a sterigma-ostium-colliculum komplex diagramja, 17) *C. asseclana* (Komló), 18) *C. chrysantheana* (Nagyharsány)

Fig. 12–18: Female genitalia of *Cnephasia* spp.; 12) terminology of genitalia, 13–16) complex of sterigma-ostium-colliculum, 17) *C. asseclana* (Komló), 18) *C. chrysantheana* (Nagyharsány)

19–23. ábra: A *Cnephasia chrysantheana* tipikus habitatjai Magyarországon: 19) Nagyharsány (Szársomlyó), 20) Tihany, 21) Kárász, 22) Gyöngyös (Sár-hegy), 23) mozaikos élőhelyszerkezet a Mecsek előterében

Fig. 19–23: Habitat of *Cnephasia chrysantheana* in Hungary; 19) Nagyharsány (Szársomlyó), 20) Tihany, 21) Kárász, 22) Gyöngyös (Sár-hegy), 23) habitat-complex in the Mecsek Mountais area

Hasonló fajok: *Cnephasia stephensiana* (Doubleday, 1849), *C. communana* (Herrich-Schäffer, 1851).

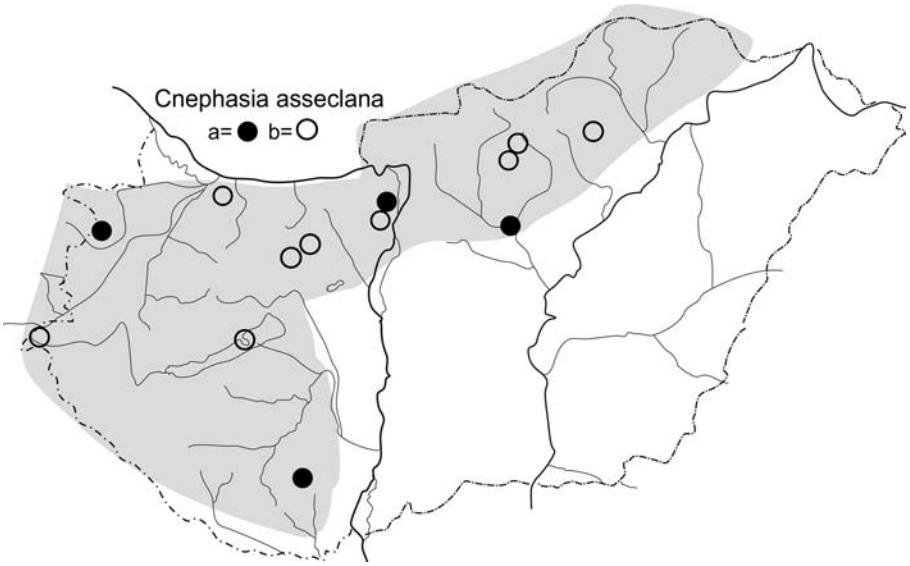
Bionómia: Az irodalmi adatok szerint az imágók júniustól júliusig egy nemzedékben repülnek (vö. RAZOWSKI 2001, 2002). A hazai gyűjtési adatok ettől eltérnek, hiszen az imágók már március végén megjelenhetnek és július végéig is repülhetnek. Nem kizárt, hogy két nemzedékben.

Polifág faj (RAZOWSKI 2001, 2002): *Artemisia*, *Carlina*, *Centaurea*, *Chrysanthemum*, *Eryngium*, *Lathyrus*, *Pulmonaria*, *Scabiosa*, *Taraxacum* és egyéb növény fajok. Szőcs (1977) hernyóját *Centaurea jacea subsp. angustifolia* Gremli [= *C. pannonica* (Heuff.) Simonk.] növényen is megtalálta. Hernyó alakban telel át. Peter Buchner Burgenlandban május végén *Chaerophillum bulbosum* levélszövedékében figyelte meg hernyóját. Az alföldi sztyeprétektől, a homokterületektől, a legelőktől a 800–1000 m-es magasságú középhegységi tájakig is felbukkan, ahol gyűjtötték mezofil réteken, sziklagyepekben, lejtősztyepeken, karsztbokorerdőkben, vízfolyások mentén, sőt házi kertekben és gyümölcsösökben is. Vannak irodalmi adatok Duna–Tisza közi turjánosból és a nyírségi lápból is, de a bizonyító példányokat eddig nem sikerült megtalálni. A Villányi-hegység Szársomlyó hegyének déli oldalán már márciusban repülő faj, melyről ez idáig nem volt tudomásunk. Az erősen szubmediterrán és balkáni hatás alatt lévő új habitat túlnyomó részét dalmát csenkeszes nyílt sziklagyep és karsztbokorerdő mozaikja foglalja el, míg a hegyoldal fölső részében a bokorerdő, alsó részében főleg a sziklagyep túlsúlya a jellemző. A hegylejtő alsó részének gyepjei tömegesen bálványfával (*Ailanthus altissima*) fertőzöttek. A hegyláb közelében lejtősztyeprét található a következő jellegzetes növényfajokkal: *Bothriochloa ischaemum*, *Cleistogenes serotina*, *Colchicum hungaricum*, *Elymus hispidus*, *Festuca rupicola*, *Stipa capillata*. Lejjebb másodlagos bokorerdő (*Fraxinus ornus*, *Ligustrum vulgare*, *Rosa canina*), majd galagonya-kökény cserjés (*Crataegus monogyna*, *Ligustrum vulgare*, *Rosa canina*) található. A hegylábon – egészen a Nagyharsányt Villánnyal összekötő országútig – szőlőt termesztenek.

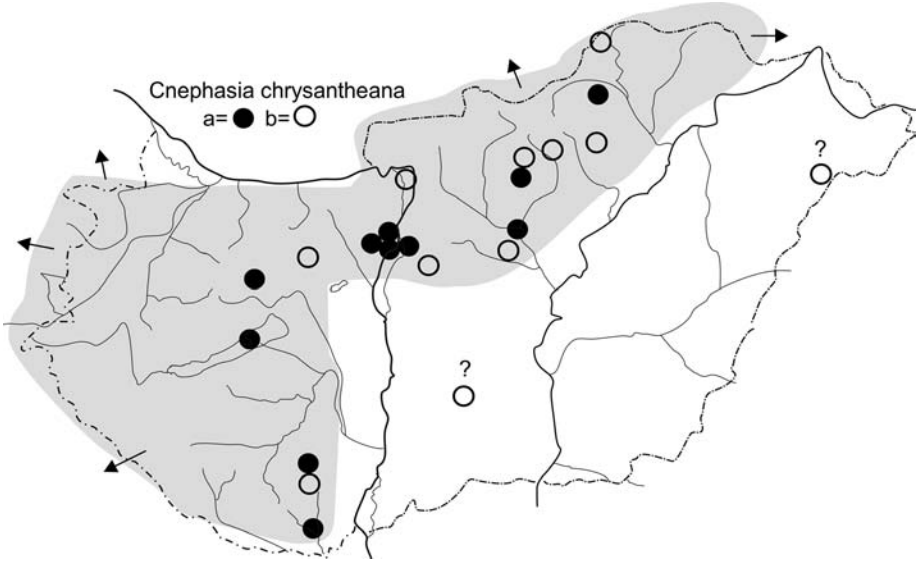
Magyarországi elterjedése: SZŐCS (1977) azon a véleményen volt, hogy *C. chrysantheana* hazánkban mindenütt előfordul, de nem túl gyakori. Az előbbi megállapítást az azonosítási, határozási anomáliák miatt – a hazai publikációs és gyűjteményi adatokat – csak egy átfogó revízió után fogadhatjuk el. A MTM gyűjteményében őrzött SZIRÁKI-féle (1980) vizsgálati anyag genitália preparátumai valódi *C. chrysantheana*-nak bizonyultak (revid. Fazekas I., 2014. május). Ezzel szemben ÁCS ESZTER által végzett genitália vizsgálat (Cserépfalu, gen. prep. No. 1390, in coll. MTM; vö. 10. ábra) tévesen identifikálta a *chrysantheana*-t, az helyesen *Cnephasia stephensiana* (revid. Fazekas I., 2014. május).

Irodalmi adatok: – ÁCS et al. 1990: Nyírség (Bátorligeti-láp); – ÁCS & SZABÓKY (1993): Bükk (Cserépfalu, Répáshuta); – BALOGH (1978): Mecsek (Pécs-Vasas); – BUSCHMANN (2004): Jászság (Farmos, Jászberény), Mátra (Kőkútpuszta, Mátrafüred-vízmű, Mátraháza, Piszkés-tető, Sár-hegy); FAZEKAS (1993): Balaton-medence (Tihany); – FAZEKAS (2002): Mecsek (Pécs-Vasas, Kárász); – GOZMÁNY & SZABÓKY (1986): Duna–Tisza köze (Bócsa: homokbuckás, Ócsa: Nagy-erdő [det. Razowski]; – SZABÓKY (1999): Aggtelek; – PASTORÁLIS & SZEŐKE (2011): Vértes; – SZIRÁKI (1980): Duna–Tisza köze (Kecskemét-Szarkás), Dunántúli-középhegység (Törökbálint), Érd-Elvira; – SZŐCS (1977): Dunántúli-középhegység (Pilis: Tahi).

Új adatok: ♀, H-Nagyharsány, Szársomlyó, 2014.03.30., leg. Gál M., det. et gen. prep. Fazekas I., No. 3334; 2 ♂, Hungaria c., Olaszfalu, 1983.06.10., leg. Fazekas I., det. et gen. prep. Fazekas I. No. 1999, 2003; ♂, Jászberény, újerdői homokterület, 2008. 06.11. és 2010.06.07., leg. et coll. Buschmann F., gen. prep. Fazekas I. No. 3379, 3381; ♀, Jászberény, borsóhalmai rét, 2003.06.20., leg et coll. Buschmann F., gen. prep. Fazekas



24. ábra: A *Cnephasia asseclana* előzetes elterjedési térképe Magyarországon;
a) ● megvizsgált példány, b) ○ irodalmi adatok
Fig. 24: Sketch-map of distribution of Cnephasia asseclana;
symbols: a) ● presence, b) ○ literary data



25. ábra: A *Cnephasia chrysantheana* előzetes elterjedési térképe Magyarországon;
a) ● megvizsgált példány, b) ○ irodalmi adatok
Fig. 25: Sketch-map of distribution of *Cnephasia chrysantheana*;
symbols: a) ● presence, b) ○ literary data

I. No. 3382; ♂, Gyöngyös, Sár-hegy, 2008.05.30., leg. et coll. Buschmann F., gen. prep. Fazekas. No. 3380.

Revideált példányok az MTM gyűjteményben: ♂, Budapest, Farkas-völgy, 1917.06.19. e. l., leg. Uhrik, gen. prep. Sziráki Gy., No. 149; ♀ Csepel, e. l. Újhelyi, gen. prep. Sziráki Gy., No. 153.

Földrajzi elterjedése: Nyugat-palearktikus faj. Transzkaukáziától Kis-Ázsián és a Közel-Keleten át Európában az Ibéria-félszigetig valamint a Brit-szigetekig sokfelé gyűjtötték, de az irodalmi adatok felülvizsgálatra szorulnak.

Jegyzet: A *Cnephasia chrysantheana* szárnymintázata rendkívül hasonló a *C. stephensiana* (Doubleday, 1849) fajéhoz, a két taxon könnyen felcserélhető. Az utóbbi faj részletes magyarországi elterjedésével egy következő tanulmány fog foglalkozni.

Összefoglalás

A szerző a magyarországi Tortricidae fajok elterjedési atlaszának kiadásán dolgozik. A munkálatok során számba veszi a problémás és nehezen határozható fajokat, így a *Cnephasia* taxonokat is. Revideálja több magán-, intézeti- és múzeumi gyűjtemény bizonyító példányait. Kritikailag elemzi a régebben megjelent publikációkat, s amennyiben szükséges és bizonyítható a téves identifikáció, akkor helyreigazításokat tesz. A rendszertelenül elhelyezkedő, sokféle azonosítási hibával (ún. inhomogenitással) terhelt, publikált elterjedési adathalmazokat csak provizórikusan sikerült egzakt area képként rögzíteni. Jelen munkájában a *Cnephasia asseclana* és a *C. chrysantheana* fajok határozó bélyegeit, bionómiáját, magyarországi és földrajzi elterjedést tekinti át, és közli a hazai *Cnephasia* fajok névjegyzékét.

A Magyarországon előforduló *Cnephasia* Curtis, 1826 fajok névjegyzéke:

C. incertana (Treitschke, 1835)
C. abrasana (Duponchel, 1843)
C. stephensiana (Doubleday, 1849)
C. alticolana (Herrich-Schäffer, 1851)
C. asseclana (Denis & Schiffermüller, 1775)
    interjectana Haworth, 1811
    virgaureana Treitschke, 1835
C. virgaureana Treitschke, 1835
C. pasiuana (Hübner, 1799)
    pascuana Hübner, 1822
    pumicana Zeller, 1847
C. genitalana Pierce & Metcalfe, 1922
C. communana (Herrich-Schäffer, 1851)
C. oxyacanthana (Herrich-Schäffer, 1851)
C. chrysantheana (Duponchel, 1843)
C. ecullyana Réal, 1951

Köszönetnyilvánítás

Köszönetet mondok Bálint Zsoltnak és Katona Gergelynek (MTM, Budapest), hogy biztosították a gyűjteményi vizsgálatokat. Köszönöm Buschmann Ferencnek (Jász Múzeum, Jászberény) a revízióra megküldött példányokat valamint a kézirat szövegéhez nyújtott észrevételeit. A vizsgálatok során végzett személyes konzultációkban segítségemre volt Pastorális Gábor (SK-Komárno). Megköszönöm Gál Miklósnak, hogy a nagyharsányi élőhelyen gyűjtött számára ismeretlen molyt átadta. Külön köszönettel tartozom Barry Goater-nek (GB-Chandlers Ford) az angol nyelvi korrektúra elvégzéséért.

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Újabb adatok Nyugat-Külső-Somogy kisemlős faunájához

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Herczeg, R. & Horváth, Gy.: *Data to the small mammals fauna of Nyugat-Külső-Somogy.*
Abstract: Small mammal fauna of Nyugat-Külső-Somogy is less known. We have been examining the occurrence of small mammals on this area with logistic regression techniques. For this, we used two site occupancy models in Bayesian statistical approach. We applied a multi-season and a hierarchical occupancy model to estimate the detection and the occurrence probabilities. The trapping was conducted with seven occasions (with 3-4 trap nights/occasion). We registered 7 species in the examined area only one of them is protected (*Micromys minutus*). The results of both detection and occupancy estimates showed that the species are not vulnerable besides the low detection probabilities. The probabilities of site occupancy were relatively high. From a conservation aspect, the total lack of water-tolerant species is an important result, however, it has to be further examined this area in the future.

Keywords:

Bevezetés

Somogy megye emlősfaunájáról 2001-ben készült katalógusban 68 fajt említenek meg, ami a hazai emlősfauna 80 %-a (Lanszki és Purger 2001). A kisemlősök közül (amelyek tömege < 200 grammnál) 26 fajt említenek meg, amely majdnem teljes mértékben lefedi a hazai kisemlős faunát. A megyében a kisemlősök kutatása hosszú múltra tekint vissza, már az 1900-as évek elejétől kezdve rendelkezünk adatokkal (Éhik 1919, 1928, Greschik 1924, Marián 1957, 1958). A megyében a kisemlősökre vonatkozó legtöbb adat bagolyköpetekből származik (Schmidt 1967, Kalivoda 1999, Bihari et al. 2007), amelyek közül az utóbbi másfél évtizedben Purger (1996, 1997, 1998, 2002, 2004, 2005, 2008, 2013) a 10×10 km-es UTM háló mentén szisztematikusan gyűjtött köpetmintákat dolgozott fel és értékelt. A monitoring jellegű, csapdázásos vizsgálatok Somogy megyében is a 2000-es évek elején indultak meg, amelyeket elsősorban a természetvédelmi szempontból kiemelt élőhelyeken végeztek el (Lanszki és Purger 2001), így a Kis-Balaton (Lelkes és Horváth 2000), a Látrányi Puszta TT (Lanszki és Nagy 2003), valamint a Boronka-melléki Tájvédelmi körzetben (Horváth és Lanszki 2000) végeztek fogás-jelölés-visszafogás módszeren alapuló vizsgálatokat.

Annak ellenére, hogy intenzív kutatások folytak a megyében, az északkeleti rész (Külső-Somogy: különösen Nyugat- és Kelet-Külső-Somogy) vonatkozásában szórványos adatok állnak rendelkezésünkre, amelyek főleg bagolyköpetekből származnak (Nagy 1988, Purger 2008, 2013, Lanszki et al. 2010). A kutatás során olyan élőhelye-

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ken végeztük a felméréseket, ahonnan eddig még nem rendelkeztünk direkt csapdázásos adatokkal a kisemlős együttesekről, így célunk volt, hogy faunisztikai szempontból Nyugat- és Kelet-Külső-Somogy kistájak határvidékéről újabb ismereteket szerezzünk a fajok elterjedéséről. A vizes élőhelyeket ért zavarások (szárazabb, csapadékosabb periódusú időjárás, elöntés, kaszálás stb.) megváltoztathatják a kisemlősök területfoglalási dinamikáját, így veszélyeztetve az ott előforduló fajok hosszú távú fennmaradását, melyek a vizes élőhelyeken megjelenő élőhely-specialista fajok (pl.: a védett vízicickány fajok) esetében még inkább kiélezett. Ezért további célunk volt, hogy olyan élőhelyeken végezzük el a felméréseket, ahol feltételeztük a víztűrő fajok (pl.: vízicickányok, közönséges kószapocok) jelenlétét.

Anyag és módszer

A csapdázásos felméréseket 12 mintavételi helyen transzekt módszerrel végeztük (1. táblázat). Az egyes transzektekben az elevenfogó műanyag dobozcsapdák (24 darab) 5 méteres távolságra voltak egymástól elhelyezve. Naponta két alkalommal ellenőriztük a csapdákat, reggel 7:00-tól és este 19:00-tól, így egy 5 napos periódus alatt 9 csapdaellenőrzésünk volt. A csapdázásokat áprilistól októberig végeztük 3-4 csapdaéjszakás periódusokban. Csalétekként szalonnát, ánizs-kivonattal és növényi olajjal összekevert gabona-magvakat, valamint sárgarépát használtunk. A csapdázások során feljegyeztük

1. táblázat: A vizsgált területek GPS koordinátái és az ÁNÉR alapján meghatározott élőhely típusuk

Terület		GPS koordináta	ÁNÉR kód
Balatonlelle	1a	É 46.798297 K 17.747641	OB - jellegtelen üde gyepek
	1b	É 46.790893 K 17.727470	
	1c	É 46.782783 K 17.721291	
Zicsi-patak	2a	É 46.674383 K 17.967625	RA - őshonos fajú, facsoportok, fasorok, erdősvákok
	2b	É 46.659393 K 17.984619	
	2c	É 46.629901 K 18.002301	
Koppány-patak	3a	É 46.598801 K 17.951488	BA - mozaik álló és folyóvizek partjainál
	3b	É 46.599096 K 17.997580	
	3c	É 46.598889 K 18.012772	
Bonnyapuszta	4a	É 46.617610 K 17.909474	P2a - üde és nedves cserjések
	4b	É 46.608678 K 17.912650	OA - jellegtelen fátlan vizes élőhelyek
	4c	É 46.604138 K 17.922006	

az állatok nemét (nőstényeknél graviditást, laktálást is feltüntetve), korát, csapdaszámát és amennyiben szükséges volt a határozáshoz, fontos testméret paramétereket is mértünk. Az egyes mintavételi területek botanikai értékelésénél az ÁNÉR élőhely osztályozási rendszer alapján (BÖLÖNI et al. 2011) megadtuk az adott élőhelyek típusát és GPS koordinátáit is (1. táblázat).

A kisemlősök vizsgálatában fontos tényező, hogy az eleven csapdázásos monitorozás során a kimutatás hiánya nem egyenértékű a teljes hiánnyal (pl. TAKEKAWA et al. 2003). Ha az adott célfaj kevés egyeddel van jelen a területen vagy rejtőzködő életmódot folytat, akkor előfordulhat, hogy egy mintavételi periódusban nem tudjuk detektálni. Ez természetesen nem azt jelenti, hogy a vizsgált faj nincsen jelen a területen, csupán a detektáció nem volt tökéletes, ezt nem tökéletes detektációnak („*imprefect detection*") nevezi a szakirodalomban (MACKENZIE et al. 2002). A vizsgálataink során ha ezt elmulasztjuk megengedni - a faj jelen volt, de nem detektáltuk -, akkor az hibás területfoglalási, kolonizációs és helyi kihalási valószínűséghez fog vezetni (MACKENZIE et al. 2006). Ebből kiindulva a jelenlét-hiány adatokat felhasználva könnyen megközelíthető és alkalmazható módszert fejlesztettek ki arra, hogy hogyan kezeljük az élőhely-foglalás értékelését, amikor a kimutatás valószínűsége kisebb egynél, ami a kisemlősök esetében csaknem mindig így van (MACKENZIE et al. 2002, 2003, MACKENZIE & ROYLE 2005). A területfoglalási valószínűségek becslése során két modelltípust használtunk fel. A ROYLE & DORAZIO (2006) által kifejlesztett modellnél (továbbiakban: RD modell) a területfoglalási és detektálási valószínűségeket becsültük, amelyhez az összes faj fogástörténetét felhasználtuk, így az alábbi sematikus fogástörténeti mátrixot képezve:

$$Y = \begin{pmatrix} y_{11} & y_{12} & . & y_{1R} \\ y_{21} & y_{22} & & y_{2R} \\ . & . & . & . \\ y_{n1} & y_{n2} & . & y_{nR} \end{pmatrix}$$

ahol minden sor egy faj (összesen n darab) detektálási történetének felel meg az R darab mintavételi időponton. Detektálási esemény (pl.: $y11$) pl.: egy 5 éjszakás csapdázási mintavétel, ahol, ha mind az öt nap megfogtuk a fajt, akkor $y11 = 5$, ha csak egy alkalommal, akkor $y11 = 1$. A modell megadja az átlagos detektálási és területfoglalási valószínűségeket, valamint ezeket külön-külön minden egyes fajra is megbecsli. Ennek a modelltípusnak azért van nagy jelentősége, mert azoknak a fajoknak is lehetővé válik a vizsgálata, amelyek nagyon alacsony egyedszámmal és/vagy fogásszámmal mutathatók ki (ROYLE & DORAZIO 2006). Általában ezeket a fajokat kihagyják az elemzésekből, amely természetvédelmi szempontból nem megengedhető. A „*multi-season*" modell esetében (MACKENZIE et al. 2003) a mintavételezés a Pollock-féle robusztus módszerrel történik (POLLOCK 1982), ahol az elsődleges periódusokon belül másodlagos periódusok is vannak. Ezzel a módszerrel lehetőség nyílik populációs szinten a detektálási és területfoglalási valószínűségek elsődleges periódusonkénti becslésére is. A vizsgálatunkban elsősorban a mintavételi hónapok e két valószínűségi változóinak az időbeli változására voltunk kíváncsiak a különböző fajok esetén.

Mindkét modelltípust Bayesian statisztikai megközelítésben használtuk fel. Az elemzéseket 3 lánccal 55000 iterációban 5000-enkénti égetéssel, az első 1000 elhagyásával végeztük. Mind a területfoglalás, mind a detektálási valószínűségeknél egyenletes eloszlást használtunk és a paraméterek nem tartalmaztak priori információt. A becsléseket R-ben (R Development Core Team 2013) az R2WinBUGS csomagon (STURTZ et al. 2005) keresztül a WinBUGS szoftverrel (LUNN et al. 2000) végeztük.

Eredmények és megvitatásuk

A csapdázások során összesen 7 kisemlős faj jelenlétét regisztráltuk a vizsgált területeken (2. táblázat). A kimutatott kisemlősük közül egyedül a törpeegér (*Micromys minutus*) védett, azonban fontos megemlíteni a güzüegér (*Mus spicilegus*) jelenlétét is, amely az európai emlősfauna endemikus faja (COROIU et al. 2008), LANSZKI et al. (2010) vizsgálatában, amelyet a Koppány-mentén Somogyacsa és Szorosad között végeztek, szintén 7 kisemlős fajt detektáltak, azonban a fentebb említett két fajt nem mutatták ki. Helyettük a vöröshátú erdeipocok (*Myodes glareolus*), valamint a mezei cickány (*Crocidura leucodon*) jelenlétét regisztrálták. Bagolyköpetekből további két fajt határoztak meg (*Sorex araneus, Microtus agrestis*) erről a területről, így Nyugat-Külső-, és Kelet-Külső-Somogy határvidékéről 11 kisemlős faj biztos előfordulásáról van információnk.

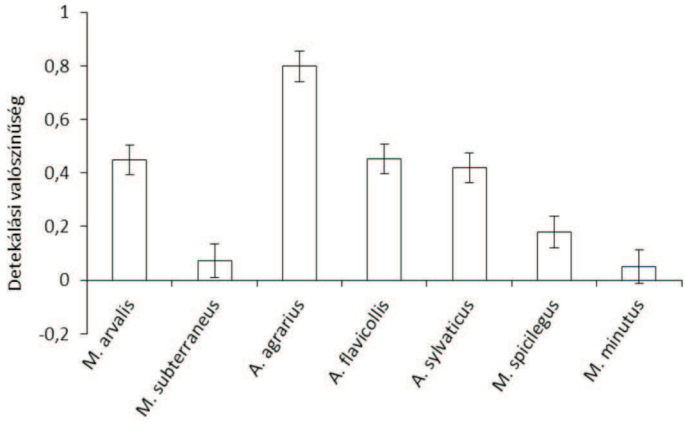
2. táblázat: A kimutatott fajok jelenlét-hiány adatai a vizsgált élőhelyek függvényében

Faj/Élőhely	1a	1b	1c	2a	2b	2c	3a	3b	3c	4a	4b	4c
Microtus arvalis	+	-	-	+	+	+	-	+	+	-	+	+
Microtus subterraneus	-	-	-	+	-	-	-	-	-	-	-	-
Apodemus agrarius	+	+	+	+	+	+	+	+	+	+	+	+
Apodemus flavicollis	+	+	+	+	+	+	+	+	+	+	+	+
Apodemus sylvaticus	+	+	+	+	+	+	-	-	+	-	+	+
Mus spicilegus	+	+	-	-	+	+	-	-	-	-	-	-
Micromys minutus	-	-	-	-	+	-	-	-	-	-	-	-

+: jelenlét; -: hiány; Balatonlelle: 1a-b-c; Zicsi-patak 2a-b-c; Koppány-patak 3a-b-c; Bonnya 4a-4-c

Az RD modell alapján az átlagos detektálási valószínűség viszonylag alacsony volt (~ 30 %), amely eredmény arra utal, hogy még további fajok jelenlétét várhatjuk a vizsgált élőhelyeken (LANSZKI et al. 2010). Ezzel szemben a becsült átlagos területfoglalási valószínűség magas volt (~97 %), amely nem meglepő, hiszen a csapdázás során minden területről valamilyen kisemlőst kimutattuk. Az RD modell külön-külön fajokra is megadta a becsléseket, ahol a kisemlősök detektálási valószínűségei különböztek (1. ábra). A legmagasabb értékkel, mintegy 80 %-al a pirók erdeiegér (*Apodemus agrarius*) volt jellemezhető. Ez a magas érték a faj széles ökológiai valenciájára utal. Három faj, a mezei pocok (*Microtus arvalis*), a sárganyakú erdeiegér (*A. flavicollis*), valamint a közönséges erdeiegér (*A. sylvaticus*) detektálási valószínűségei 40-45 % körüli volt. A güzüegér (*Mus spicilegus*) fogási valószínűsége 18 %, míg a két legalacsonyabb értékkel rendelkező kisemlősé (*M. minutus, M. subterraneus*) 5, illetve 7 % körüli volt (1. ábra). A mintavételi területek vonatkozásában ez utóbbi három alacsonyabb érték a fajok kismértű populációjára utal.

A MACKENZIE et al. (2006) által kidolgozott „*multi-season*" területfoglalási modellt bayesian statisztikai megközelítésben használtuk a becslések során (KÉRY & SCHAUB 2012). A kimutatott fajok közül két kisemlős esetében (*M. subterraneus, M. minutus*) nem állt elegendő adat rendelkezésre a területfoglalási és a detektálási valószínűségek



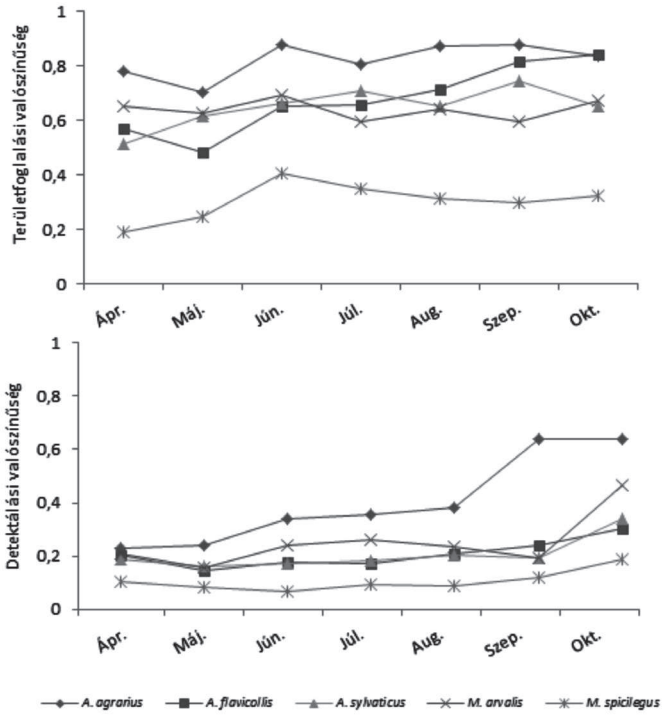
1. ábra: A kimutatott fajok detektálási valószínűsége a teljes vizsgálati időszakra vonatkoztatva

becsléséhez, így csak a másik öt fajra végeztük el az elemzést. A „*multi-season*" modell eredményei megerősítették a korábbi eredményünket. A legmagasabb területfoglalási valószínűséggel a pirók erdeiegér rendelkezett, amely a mintavételi hónapok többségében magasabb volt, mint a többi vizsgált fajé (2. ábra). A sárganyakú erdeiegér, a közönséges erdeiegér, valamint a mezei pocok vonatkozásában valamivel alacsonyabb értékeket becsült a modell, de mindegyik becsült érték 50 % -ék feletti volt. A güzüegér (*M. spicilegus*) esetében a területfoglalási valószínűség nem haladta meg a 40 %-ot. A detektálási valószínűségek a vizsgálat kezdeti szakaszban mind a hat kisemlősnél közel hasonló volt, 20 %-os érték körül ingadozott. Az idő múlásával a pirók erdeiegér esetében határozottan emelkedett, egészen 60 %-ig. A többi fajnál ez az emelkedés nem volt ilyen határozott. Ez az eredmény a kisemlősökre jellemző őszi demográfiai csúcsra utalt (GETZ et al. 2006).

Eredményeink 7 kisemlős faj előfordulási adataival gazdagították Somogy megye észak-keleti területére vonatkozóan leírt emlősfauna ismeretanyagát. Fontos kiemelni, hogy a várakozásainkkal ellentétben egy víztűrő faj jelenlétét sem tudtuk bizonyítani a csapdázásos vizsgálat során. A fajok és/vagy a populációk hatékony védelméhez ismernünk kell a tér-időbeli dinamikájukat, amelyhez a későbbiek folyamán rendszeres csapdázásos vizsgálatok szükségesek.

Természetvédelmi vonatkozások

A bagolyköpet elemzéseken alapuló vizsgálatoknak nagy jelentősége van, mivel indirekt módon, viszonylag gyorsan nagy mennyiségű információt szerezhetünk a kisemlősökről. Ezek főleg faunisztikai szempontból értékesek, azonban lokális szinten a legtöbb esetben nem lehetséges a hosszabb távú vizsgálat, mivel ez feltétel csak abban az esetben valósul meg, ha az adott lokalitásban a baglyok (költőpár) jelenléte hosszabb távon zavartalan, amit nagymértékben befolyásol a gyöngybaglyok állományának változása, illetve a rendszeres köpetgyűjtés okozta zavarás. Azokon a területeken, ahol a bagolyköpetekből olyan fajokat detektálnak, amelyek természetvédelmi szempontból fontosak,



2. ábra: A kimutatott fajok becsült területfoglalási (felül) és detektálási (alul) valószínűségi értékei az adott mintavételi hónapra

kiemeltek (pl.: védett, fokozottan védett fajok), meg kell indítani a csapdázásos felméréseket, hogy a populáció(k) állapotáról pontosabb képet kapjunk. Ez különösen igaz azokra a területekre, amelyek semmilyen védettségek nem élveznek, mivel általában ezekről nincs vagy csak szórványos információval rendelkezünk a kisemlősök vonatkozásában.

Az eddigi eredményeink alapján elmondható, hogy a vizsgált területek vonatkozásában a víztűrő fajok hiánya természetvédelmi szempontból értékes információ. Azonban ezekről az élőhelyekről még nem rendelkezünk csapdázásos adattal a 2013-as évet megelőzően, így az eddigi eredményekből levonható következtetések sok bizonytalanságot tartalmaznak, amit figyelembe kell venni az értékelés során. A bizonytalanságok kiküszöbölésére több évig tartó csapdázásos vizsgálat lenne megfelelő. Ezeknek a fajoknak a hosszú távú fennmaradása, csak jól működő metapopulációs dinamikával lehetséges, mivel ezek a kisemlősök erősen a vizes területekhez kötődnek, amelyek az elkövetkezendő évtizedekben a klimatikus viszonyok miatt nagymértékben megváltozhatnak. Ha nincs megfelelő metapopulációs dinamika, akkor ezek a fajok véglegesen eltűnhetnek a vizsgált területekről. Hazánkra a meteorológiai előrejelzések a következő évtizedekre az éghajlat szárazabbá válását és melegedését prognosztizálják (valamint az időjárás gyors változékonyságát), így a vizes élőhelyek csökkenését, feldarabolódását, eltűnését várhatjuk. Az ilyen típusú élőhelyeken, főleg azokon, amelyek nem védettek, valószínűleg az állományok erősen csökkenő tendenciát mutatnak, amelyet tovább súlyosbítanak az

antropogén beavatkozások (kaszálás, meder átalakítás, stb.). Ezekre megfelelő figyelmet kell fordítani a jövőben, különben lokálisan elveszíthetjük e kisemlősöket, melyek jó indikátorai a természetközeli élőhelyek különböző eredetű zavarások hatásainak.

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New data on the distribution of barbastelle bat (*Barbastella barbastellus*) in Western Hungary

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Winkler, D., Erdő Á, Mille, J. & Kovács, H.: *New data on the distribution of barbastelle bat (Barbastella barbastellus) in Western Hungary.*

Abstract: Acoustic bat surveys have been carried out between end of April and mid-September of 2013 in several Natura 2000 sites of Vas and Somogy counties. As a result occurrences of barbastelle bat (*Barbastella barbastellus*) were detected in 9 out of the 12 surveyed Natura 2000 sites. The species was recorded in various riverine and floodland forest communities, such as ash-alder forests, willow-poplar forests and oak-elm-ash forests, as well, as in lowland pedunculate oak-hornbeam woodlands. A total of 17 new UTM 10x10 km^2 squares with barbastelle bat occurrence have been added to the 10 formerly known squares in Vas and Somogy counties. The results show a possible expansion of this species in lowland woodland areas, which requires appropriate guidelines for forest management in the affected sites.

Keywords: acoustic bat survey, Barbastella barbastellus occurrence, Natura 2000, forest management

Introduction

The barbastelle bat [*Barbastella barbastellus* (Schreber, 1774)] is regarded as one of the rare and strictly protected bat species in Hungary. Distributed throughout Europe, from England, Sweden and Latvia in the north, to the Mediterranean. It is also present on various Mediterranean islands and reaches North Africa in Morocco. The eastern border of the distribution area is located in the Caucasus (Urbańczyk 1999, Schober 2004, Dietz et al. 2009). The barbastelle bat is protected in the European Union under Annexes II and IV of the Habitats Directive 92/43/EEC.

In Hungary, the species mostly prefers submontane forest habitats, where it is more common in large, continuous old forest stands (Szatyor 2000, Bihari 2007). It also occurs, with lower density, in lowland areas (Bihari 2007, Görföl & Dombi 2009), where it also prefers old, close-to-nature forests (Görföl & Estók 2014).

With technological development bat detectors became widely used in the 21st century. It is now easier and more feasible to define the distribution of a wide range of bat species with recording acoustic communication and hunting calls of bats than any other method. Dombi (2005) recorded the barbastelle bat in lowland areas along the Dráva River while, after long decades of absence, Szatyor (2005) newly detected it in the Őrség along the Rába River.

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In 2013 acoustic bat surveys have been carried out in several Natura 2000 sites in Western Hungary. This paper presents newly recorded distribution data of the barbastelle bat in Vas and Somogy counties.

Material and methods

Study area

The surveys were carried out in several Natura 2000 sites in Vas and Somogy Counties; Western Hungary, the list of surveyed sites are as follow:

Vas County

Ablánc-patak völgye (1 366.3 ha)
Kenyeri repülőtér (589.0 ha)
Pinka (455.2 ha)
Rába és Csörnöc völgy (11 781.0 ha)

Somogy County

Boronka-melléke (10 643.7 ha)
Dékány-hegy (881.1 ha)
Jánosházi-erdő és Égett-berek (591.2 ha)
Kisbajomi erdők (1 280.6 ha)
Mernyei-erdő (237.4 ha)
Mocsoládi-erdő (2 629.7 ha)
Pati-erdő (349.8 ha)
Törökkoppányi-erdők (2 167.7 ha)

The surveyed area covered a total of 32972.7 hectares.

Survey methods

Bat surveys were carried out three times in 2013, between the end of April and mid-September, roughly following the guidelines by the Agreement on the Conservation of Populations of European Bats (BATTERSBY 2008). In each night the recording started shortly after sunset under good weather conditions with no rain, strong wind or low temperature.

For the acoustic surveys Pettersson D500X detectors (Pettersson Elektronik, Uppsala, Sweden) were used. In each survey sites 1 km long transects in every 500 hectares were determined to cover major habitat types. Point count method was used to survey rivers and streams, setting one point per 5 kilometers. The detector was recording for a total of 20 minutes in each sampling point.

Data analysis

The identification of barbastelle bat from its echolocation call is possible with a highly reasonable confidence. The barbastelle bat typically alternates two call types in a sequence (Fig. 1): a. call with peak frequency at ~32 kHz, start frequency at ~40 kHz and end frequency at ~28; b. a low intensity call with peak frequency at ~42 kHz, start frequency at ~45 kHz and end frequency at 30-35 kHz (DIETZ et al. 2009, RUSS 2012).

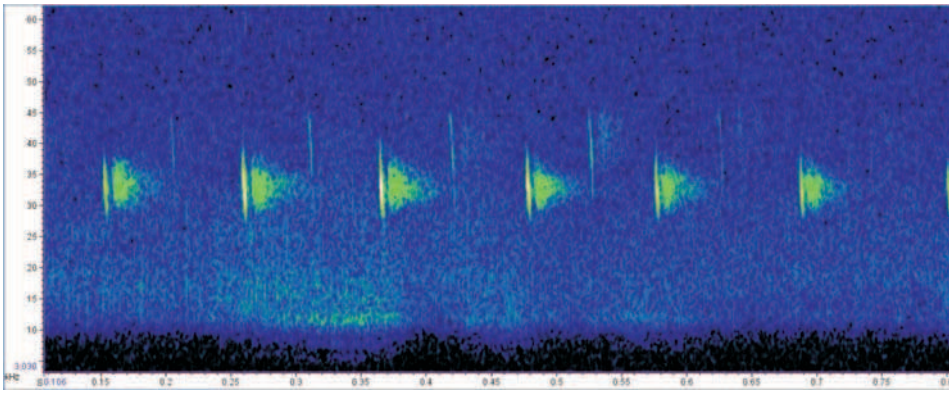

Fig. 1: Typical alternating echolocation call of barbastelle bat (recorded at the Rába River)

The sound files of .wav format recorded with the detector were first edited by using the software Adobe Audition 3.0. The edited files were then analysed with the software SonoBat 3.1.5p by measuring the following key parameters of the echolocation call: frequency of maximum energy; start frequency; end frequency; call duration; inter-pulse intervals, respectively.

Results

During the surveys we detected the presence of the barbastelle bat in 9 out of 12 Natura 2000 sites (Table 1). While recorded only in the spring and autumn period in the site "Rába és Csörnöc-völgy", the species was constantly present, including reproduction period in the summer, in all other sites. barbastelle bats have been detected in various riverine and floodland forest types including ash-alder woodlands, willow-poplar woodlands, oak-elm-ash woodlands, also in lowland pedunculate oak-hornbeam woodlands.

Table 1: Natura 2000 sites with barbastelle bat record data

Natura 2000 site	**record date** (dd/mm/yyyy)
Ablánc-patak völgye	17/05/2013; 18/06/2013; 22/09/2013
Rába és Csörnöc völgy	17/04/2013; 19/09/2013; 28/09/2013
Boronka-melléke	09/05/2013; 28/05/2013; 04/07/2013; 25/07/2013; 15/09/2013; 19/09/2013
Dékány-hegy	07/05/2013; 29/07/2013; 30/08/2013
Égett-berek és Jánosházi erdő	25/04/2013; 30/04/2013; 15/06/2013; 17/06/2013; 19/08/2013; 02/09/2013
Kisbajomi-erdő	23/04/2013; 29/06/2013; 15/08/2013
Mocsoládi-erdő	15/05/2013; 22/07/2013; 27/08/2013
Pati-erdő	22/04/2013; 05/06/2013; 09/08/2013
Törökkoppányi-erdő	08/05/2013; 13/07/2013; 18/09/2013

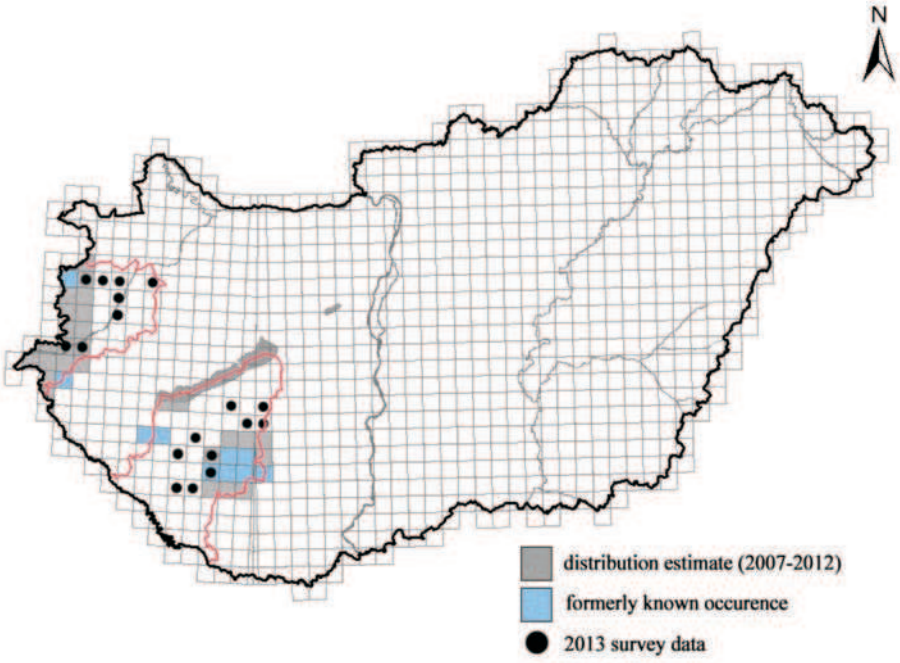

Fig. 2: Estimated distribution (2007-2012) and formerly known occurences of barbastelle bat in Vas and Somogy Counties (EIONET 2013) and the results of the 2013 surveys

In the counties Vas and Somogy, total number of UTM 10x10 km squares, where barbastelle bat's occurrence has been proved, increased from 10 to 27 (Fig. 2).

Discussion

While mainly considered as a sub-montane species in Hungary (SZATYOR 2000, BIHARI 2007), more and more observations of Barbastelle Bats are reported from lowland areas (DOMBI 2005, SZATYOR 2005, GÖRFÖL & DOMBI 2009). This phenomenon is well reflected in our detector survey results in Vas and Somogy Counties. Although the presence of colonies has not been proved due to the limitations of the method used, the constant detection of the species in most survey sites strengthen the probability of reproduction. The availability of suitable habitats is generally adequate, since both riverine woodlands and lowland pedunculate oak-hornbeam woodlands could offer sufficient food source (e.g. moths) and roosting possibilities. Since loose bark is considered as the most important roost type for this species (RUSSO et al. 2004, GÖRFÖL & DOMBI 2009), the presence of standing dead trees in these forests is crucial for the barbastelle bat. The new occurrences underline also the necessity to determine appropriate guidelines for woodland management in the affected sites, which include elimination of clear-cuts, preservation of dead and mature trees; reforestation with native tree species only and clearing of invasive tree species, such as *Fraxinus pennsilvanica* and *Acer negundo* in the riverine forests.

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