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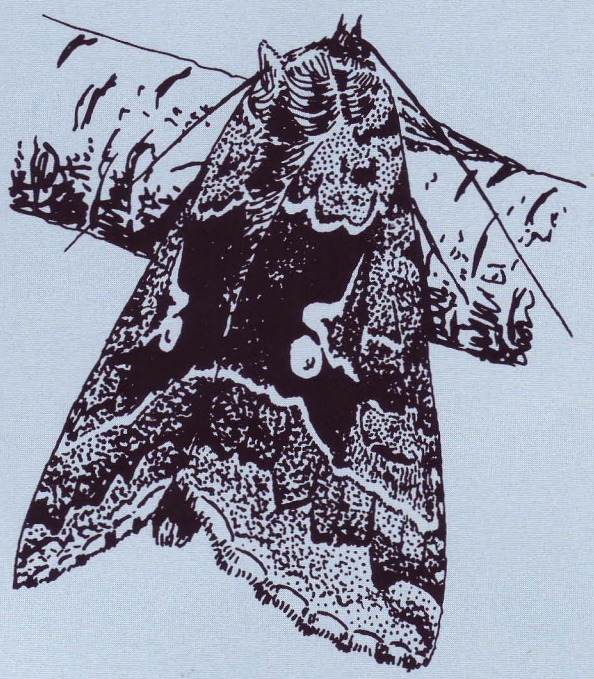

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Front cover: *Syngrapha interrogationis* (L., 1758) (Lepidoptera, Noctuidae). Artist: Hallvard Elven.

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Contribution to the taxonomy of the Holarctic *Ula* Haliday, 1833 (Diptera, Pediciidae)

Jukka Salmela & Tero Piirainen

Salmela, J. & Piirainen, T. 2003. Contribution to the taxonomy of the Holarctic *Ula* Haliday, 1833 (Diptera, Pediciidae). Norw. J. Entomol. 50, 73-90.

The genus *Ula* Haliday, 1833 includes 12 Palaearctic and 2 Nearctic species; only *U. sylvatica* (Meigen, 1818) has Holarctic distribution. *Ula kiushiuensis* Alexander, 1933 (Palaearctic), *U. sylvatica* (Holarctic), *U. cincta* Alexander, 1924 (Palaearctic), *U. elegans* Osten Sacken, 1869 (Nearctic), *U. comes* Alexander, 1935 (Palaearctic) and *U. provecta* Alexander, 1936 (Palaearctic) are redescribed and important morphological characters, male and female terminalia, are illustrated. A key to the European species of the genus is presented. Two new synonymes of *U. sylvatica* are established: *Ula paupera* Osten Sacken, 1869 (syn. nov.), and *U. longicornis* Dietz, 1921 (syn. nov.). *Ula ciscuncta* Stary, 1996 (syn. nov.) is a synonym of *U. succincta* Alexander, 1933. *Ula kiushiuensis* Alexander, 1933 is reported for the first time from North Korea and from west Palaearctic, Finland and Russian Karelia.

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INTRODUCTION

Ula Haliday, 1833 (Diptera, Pediciidae) is a rather small genus: 12 species are known from the Palaearctic region (Savchenko et al. 1992) and two species are reported from the Nearctic (this study). According to Alexander & Alexander (1973) 15 *Ula* species are known from the Oriental region. *Ula* specimens are medium sized (wing length 6.4-8.4 mm) flies with long legs, as typical within Tipulomorpha. Pubescent ommatidia and the presence of macrotrichia on the wing membrane characterise the species of the genus. Larvae of the genus are known to inhabit fruiting bodies of fungi (eg. Alexander 1915, Yakovlev 1994).

Some of the existing descriptions of the species are rather poor and figures of important characters, like terminalia, may be totally lacking or inadequate. The European species of the genus are relatively well known and diagnostic characters are figured in the following articles: *Ula bolitophila* Loew, 1869 (Tjeder 1959, Savchenko 1971, Stary 1971, Savchenko 1986); *Ula mixta* Stary, 1983 (Stary 1983, Stary 1996); *Ula mollisima* Haliday, 1833 (Agrell 1945 as *crassicauda*, Tjeder 1959 as *crassicauda*, Hutson & Vane-Wright 1969, Stary 1983, Savchenko 1986) and *Ula sylvatica* Meigen, 1818 (Agrell 1945 as *macroptera*, Tjeder 1959, Hutson & Vane-Wright 1969, Thomas & Vaillant 1977, Savchenko 1986). According to Reusch and Oosterbroek (1997) *U. bolitophila*, *U. mixta*, *U. mollisima* and *U. sylvatica* have been recorded from Norway. The purpose of this paper is to contribute our knowledge on the taxonomy of the Holarctic *Ula*, especially species described by Alexander, and pinpoint some issues for further studies.

MATERIAL AND METHODS

Most of the material studied was dry and pinned. Some terminalia (both males and females) were KOH treated and mounted on microscope slides in Euparal. The material is deposited in the follo-

wing collections, later referred to by the city only: Academy of Natural Sciences of Philadelphia, Philadelphia; Alexei Polevoi collection, Petrozavodsk; Canadian National Collection of Insects, Ottawa; Jukka Salmela collection, Jyväskylä; Museum of Comparative Zoology, Cambridge; National Museum of Natural History, Washington DC.

GENUS AND SPECIES

The genus *Ula* Haliday

Haliday 1833: 153

Macroptera Lioy 1863: 224.

Head more or less dark, sometimes grey microtrichose, ommatidia pubescent. Last palpal segment elongated, as long as or longer than the two preceeding segments. Antennae 17-segmented, flagellomeres usually dark, finely pubescent. Pedicel globular, usually pale. Scape/pedicel ratio about 1:1. Third flagellomere width/length ratio range from 0.6 to 0.2. Verticils as long as or longer than respective segment. Flagellomeres may be shorter in females.

Coloration of thorax yellowish brown to dark brown, coxae and trochanters usually yellowish brown. Spur formula 1:2:2. Legs long, as characteristic in Tipulomorpha. Coloration of legs from yellowish brown to dark brown. Wings more or less brown tinged, typical wing venation pattern in Figures 1 and 2. Pterostigma brown, in some species centre of pt not darker than wing membrane. Rather variable wing pattern, at least a more or less dark cloud on R-M. Macrotrichia present on the wing membrane. Length of wings 6.4-8.4 mm, females usually have longer wings.

Abdomen brown, may be paler ventrally than dorsally. Tergite 9 of the male apically truncate and evenly rounded, caudal margin with a number of fine setae. Caudal margin of sternite 9 with variable shape. Gonostylus rather short and stout, apically pointed (Figure 4) or rounded (Figure 19), bearing number of dark, stout spines apically and subapically. Female cerci rather strongly upcurved, apically sharply pointed. Margins smooth (Figures 11, 16) or serrated (Figures 7, 24). Vaginal apodeme either bipartite and strongly sclerotized (Figures 6, 12) or only moderately sclerotized, unipartite and chitinious structures within peripheral frame (e.g. Figures 17, 22), tapering proximally to a rather acute tip.

Discussion: StarΩ (1992) raised Pediciidae to a family level within the infraorder Tipulomorpha, as the sister group of Tipulidae + Cylindrotomidae. Pediciids share the following characters: pubescent ommatidia, spurred tibiae, strongly retracted Sc_2 and four-branched media (StarΩ 1992). Members of the genus *Ula* are easily distinguished by their macrotrichose wing membrane. In addition, the simple shape of gonostyle (males) and short and stout, apically pointed cerci (females) are typical characters to the *Ula* within Holarctic pediciids. In phylogenetical terms, the genus *Ula* is apparently rather isolated within the Pediciidae, and it may form its own tribe within the family (StarΩ 1992).

Species included: *Ula bolitophila* Loew, 1869 (Palaearctic), *U. cincta* Alexander, 1924 (Palaearctic), *U. comes* Alexander, 1935 (Palaearctic), *U. elegans* Osten Sacken, 1869 (Nearctic), *U. kiushiuensis* Alexander, 1933 (Palaearctic), *U. mixta* StarΩ, 1983 (Palaearctic), *U. mollisima* Haliday, 1833 (Palaearctic), *U. provecta* Alexander, 1936 (Palaearctic), *U. succincta* Alexander, 1933 (Palaearctic), *U. sylvatica* (Meigen, 1818) (Holarctic).

Ula kiushiuensis Alexander

Figures 1, 3, 4, 5, 6, 7

Alexander 1933b: 541; Savchenko & Krivolutskaya 1976: 48; Savchenko 1983: 33.

Material examined: Holotype, a slide mounted ♂: «Ula kiushiuensis Al./ ♂ legs: ant.: dist./ Japan (Kyushu)/ Sobosan (Bungo)/ aug. 3. 1931/ (K. Yasumatsu)/ The Alexander Collection/ of Crane-Flies/ HOLOTYPE 5219» (in Washington) (white label on a slide, partly hand written; the holotype is apparently partly lost: only a slide including a wing, two legs, part of an antenna, gonocoxite and gonostylus is left). Other material: Shikoku, Mt Sasa 800-900 m, V.6.54 Yano 1♂ (in Washington); Sapporo, Japan Nov. 21 '32 Okada

A key to the European species of *Ula*

[For the separation of Nearctic species, see Discussion in *Ula elegans*]

Males

1. Gonostylus pointed, bearing 7-11 dark, stout spines (Figures 4, 9) 2

- Gonostylus rounded, bearing ca. 15-17 dark, stout spines (Figure 27) 3

2. Ejaculatory apodeme long and proximally sharply pointed (Figure 5) ..... *U. kiushiuensis*

- Ejaculatory apodeme short and not sharply pointed (Figure 10) ..... *U. sylvatica*

3. Wing pattern: dark clouds on fork R_1-R_s and vein M-M; a continuous dark seam from vein M-Cu via fork R_2-R_3 to pterostigma. Caudal margin of 9th sternite with a flap like projection. Hypopygium (Figure 26). ..... *U. bolitophila*

- Wing pattern: pterostigma brown, veins R-M and M-Cu faintly infuscated. Caudal margin of 9th sternite with distinct median U-shaped notch 4

4. Aedeagus with a membraneous flange (dorsal view); aedeagus sinuous in lateral view (see StarΩ 1983, 1996) ..... *U. mixta*

- Aedeagus without such a membrane 5

5. U-shaped notch on the caudal margin of the 9th sternite very deep; aedeagus straight in lateral view (see StarΩ 1996) ..... *U. succincta*

- U-shaped notch on the caudal margin of the 9th sternite moderate (see StarΩ 1983, 1996) ..... *U. mollisima.*

Females

1. Vaginal apodeme bipartite, proximal part strongly sclerotised, dark in colour (Figures 6, 12) 2

- Vaginal apodeme different 3

2. Distal portion of the cerci ventrally serrated (Figure 7); vaginal apodeme (Figure 6) ..... *U. kiushiuensis*

- Distal portion of the cerci smooth (Figure 11); vaginal apodeme (Figure 12) ..... *U. sylvatica*

3. Wing pattern: dark clouds on fork R_1-R_s and vein M-M; a continuous dark seam from vein M-Cu via fork R_2-R_3 to pterostigma. Vaginal apodeme (see Tjeder 1959). ..... *U. bolitophila*

- Wing pattern: pterostigma brown, veins R-M and M-Cu faintly infuscated. 4

4. Vaginal apodeme tapering gradually to an acute tip, no darker elements within the peripheral frame (see StarΩ 1983) ..... *U. mixta*

- The tip of vaginal apodeme broader, faintly chitinised median structure within the peripheral frame (see StarΩ 1983) ..... *U. mollisima & succincta.*

1♀ (in Washington); Iwatu-quni, Iwats-Ken, Honsu – Japan, 3000', V17.35 H. Yamamoto, 1♂ (in Washington); North Korea, Kankyo Nando, Puksu Pyuksan Alt. 5500 ft VI-28 1939, A. Yankovsky, 1♀ (in Washington); North Korea, Ompo 150 ft. V-13. 1938, 1♂ (in Washington); North Korea, Ompo 900 ft. V-12. 1938, 1♂ (in Washington); North Korea, Ompo 300 ft. V-19 1938 Yankovsky, 1♂ (in Washington); North Korea, Ompo, 700 ft. V-18. 1938 Yankovsky, 1♂ 3♀♀ (in Washington); North Korea, Ompo 200 ft. V-21. 1937 Yankovski,1♀ (in Washington); Finland, Kb: Ilomantsi, Tapionaho 19.-25.8.1994 Malaise trap, A. Polevoi leg. 1♀ (in Petrozavodsk); Finland, N: Espoo, Pitkäsuon laskupuro, Nuuksio National Park 29.8.-27.9.2002 Malaise trap, J. Ilmonen leg, 1♀ (in Jyväskylä); Ks: Kuusamo, Ampumavaara, Oulanka National Park, 26.6.-19.7.2001 Malaise trap, K. Kuusela leg, 1♀ (in Jyväskylä); Russia, Kb: Tolvajärvi 11-27.9.1998 Tietäväinen leg 1♂ (in Petrozavodsk).

Diagnosis: Body generally brown to dark brown. Antennal pedicel pale; scape and flagellomeres dark. Wings with usual macrotrichia on wing membrane, slightly infuscated, vague clouds on forks R_2-R_3, R_1-R_5 and on veins M-M and M-Cu. Male: ejaculatory apodeme of the aedeagal complex long and proximally sharply pointed and female cerci with serrated ventral tip.

Male. Head dark brown to almost black, antennae 17-segmented. Scape dark brown, pedicel distinctly paler; flagellomeres dark brown, decreasing in length towards apex of antenna.

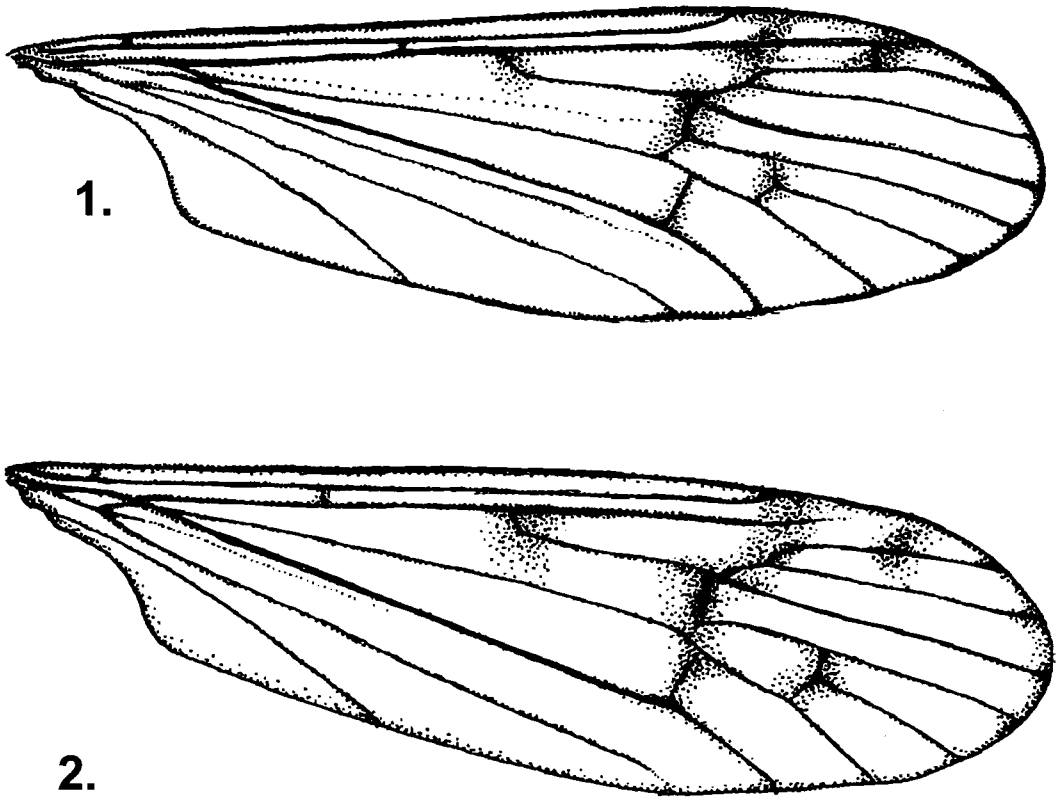


Figure 1-2. 1. *Ula kiushiuensis* Alexander, wing (Finland); 2. *U. comes* Alexander, wing (holotype).

Verticils about as long as respective flagellomere; whole flagellum pubescent. Third flagellomere width/length ratio 0.2.

Thorax generally brown to dark brown, restictedly patterned with yellowish colour on epimeron. Wings infuscated, membrane covered with typical macrotrichia. Pterostigma brown; centre of pt not darker than wing membrane. Vague clouds on forks R_2-R_3, R_1-R_s and on veins M-M, M-Cu (Figure 1). Wing length ca. 6.5-7 mm. Coxae and trochanters yellowish, legs light brown to brown.

Abdomen brown. Caudal margin of tergite 9 evenly rounded, with a number of setae, posterior margin of sternite 9 moderately notched. Hypopygium (Figure 3). Gonostylus (Figure 4) rather pointed and slightly arcuated, bearing eight dark, stout spines. Aedagal complex (Figure 5) apically tripartite, relatively elongated; aedeagus rather long and thin, distally pointed. Ejaculatory apodeme conspicuous, long and proximally sharply pointed.

Female. External characters like in the male. Third flagellomere width/length ratio 0.3-0.35. Wing length

7.2-8 mm. Cerci (Figure 7) rather short and stout, strongly up-curved, ventral tip more or less clearly serrated. Vaginal apodeme (Figure 6) bipartite and rather strongly sclerotized. Clearly chitinised median structure within the peripheral frame.

Distribution: Palaearctic: Japan, Russian Far East, North Korea, Russian Karelia, Finland.

Discussion: *Ula kiushiuensis* is here reported for the first time from North Korea and from west Palaearctic; Russian Karelia and Finland. The species is easily distinguished by the characters in the abdominal terminalia of both sexes: large and elongated aedeagal complex of the male and the

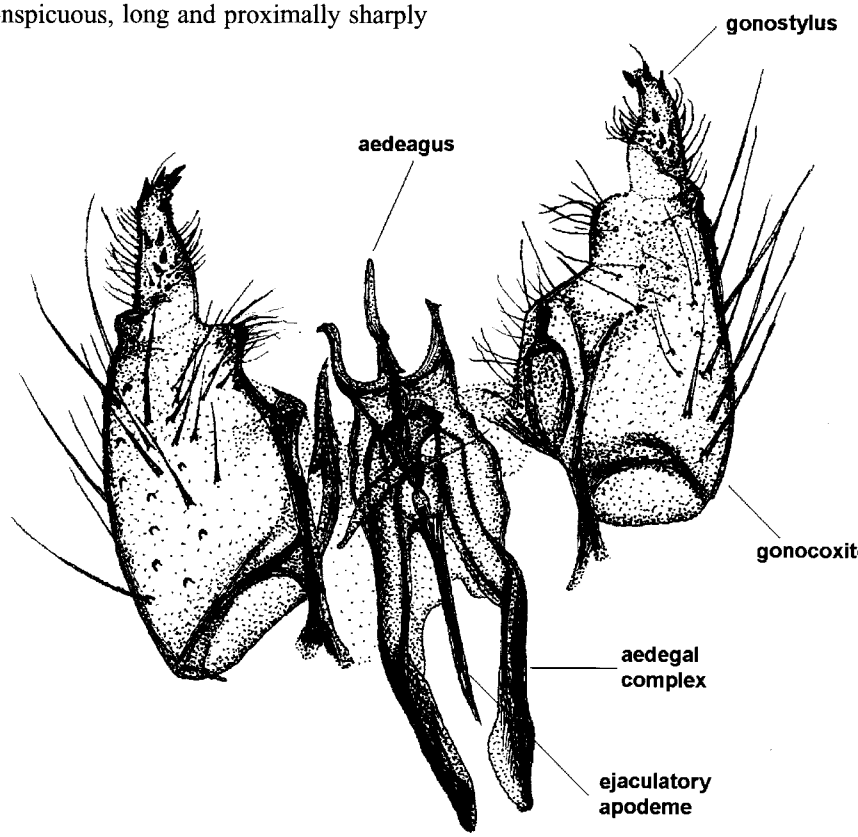


Figure 3. *Ula kiushiuensis* Alexander, male hypopygium, dorsal view (Finland).

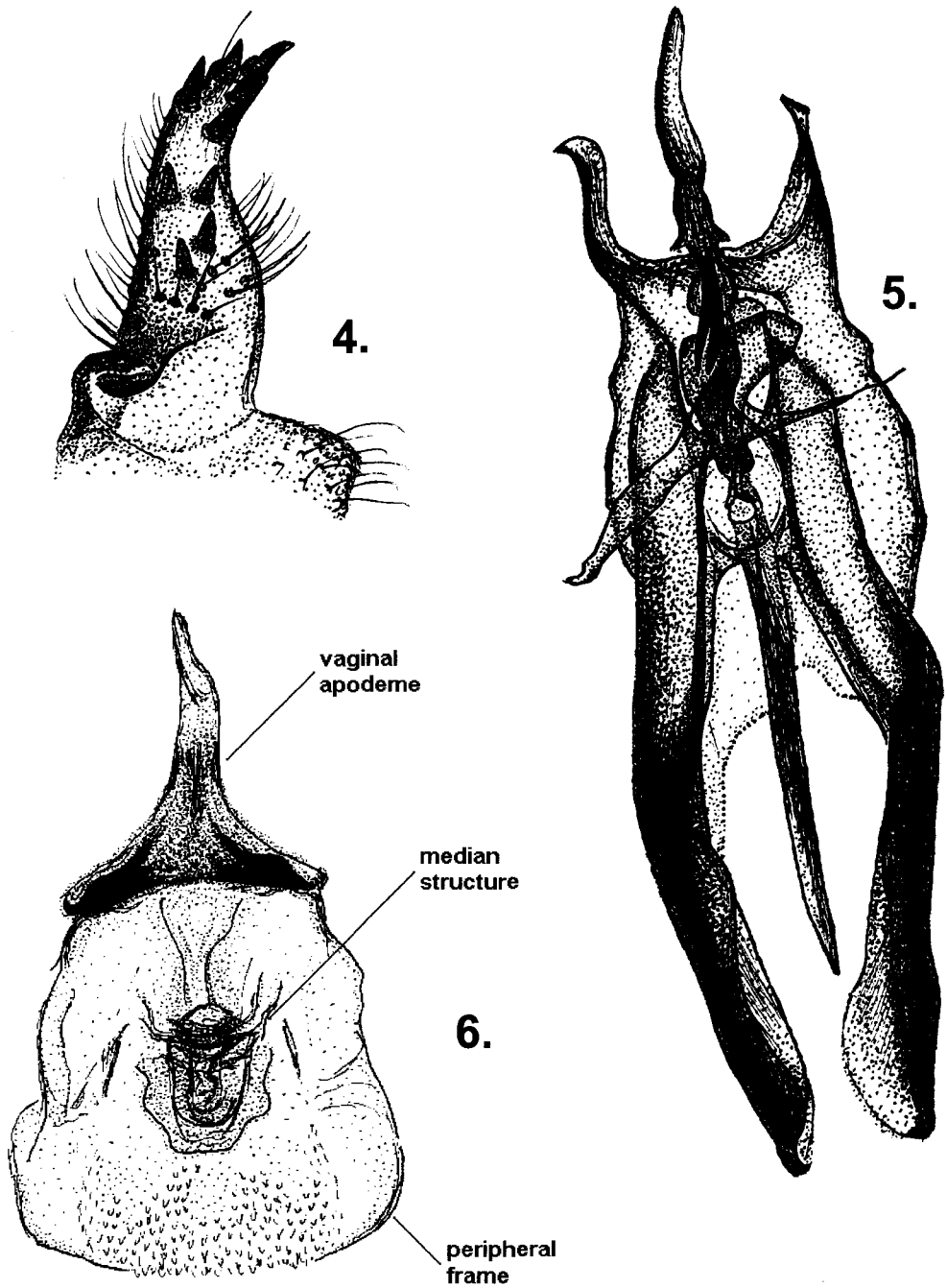
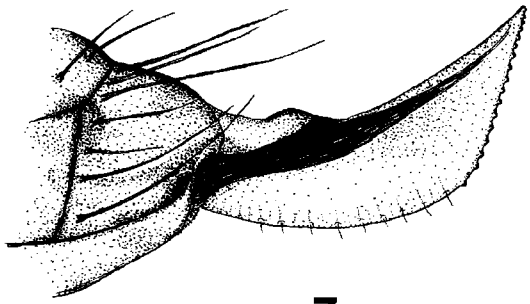


Figure 4-6. *Ula kiushiuensis* Alexander: 4. Male gonostylus (Finland); 5. Male aedeagal complex (Finland). 6. Female vaginal apodeme, dorsal view (Finland).



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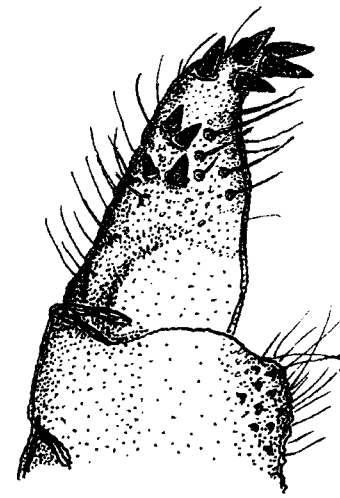

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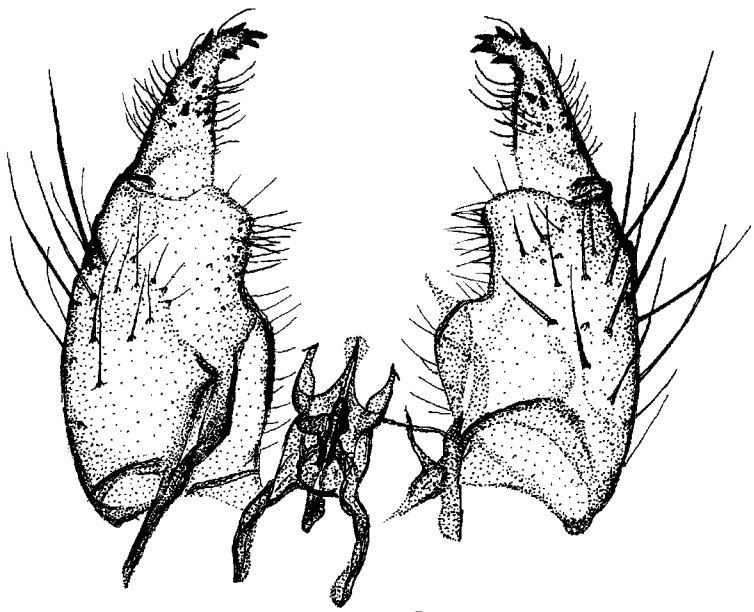

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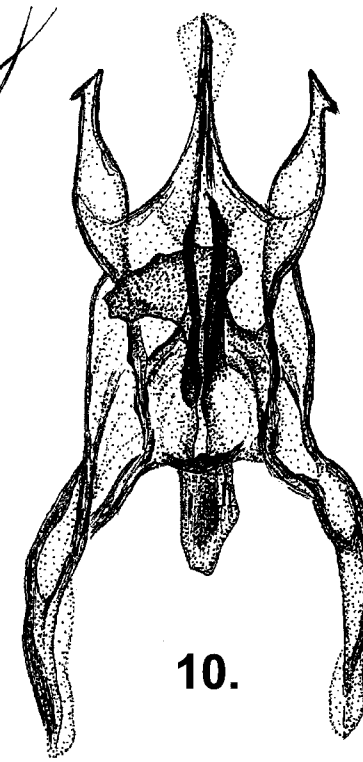

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Figure 7-10. 7. *Ula kiushiuensis* Alexander, female cerci, lateral view (Finland); 8. *U. sylvatica* (Meigen), male hypopygium, dorsal view (Finland); 9. Male gonostylus (Finland); 10. Male aedeagal complex, dorsal view, (Finland).

serrated cerci of the female. It, however, should be noted that some females collected from east Palaearctic lack clearly serrated cerci. Instead, the cerci is rather smooth and the identification must be based on the vaginal apodeme. Wing pattern resembles *Ula bolitophila* Loew, a widely distributed Palaearctic species, but the wing pattern of *U. bolitophila* is usually somewhat more pronounced than in *U. kiushiuensis*.

Ula sylvatica (Meigen)

Figures 8, 9, 10, 11, 12

Meigen 1818: 132; Meijere 1921: 93 (as *macroptera* = *sylvatica*); Edwards 1938: 62; Agrell 1945:26 (as *macroptera* = *sylvatica*); Tjeder, 1959: 8; Hutson & Vane-Wright 1969:245; Thomas & Vaillant 1977: 389; Savchenko 1986: 127.

Limnobia macroptera (Macquart); Maquart 1826: 158.

Limnobia pilosa (Schummel); Schummel 1829: 149.

Limnobia vagans (Walker); Walker 1848: 43.

Macroptera quadrivittata (Lioy); Lioy 1863: 225.

Ula paupera Osten Sacken; Osten Sacken 1869: 277; Dietz 1921: 250; Alexander 1966: 344; Alexander 1967: 89. syn. nov.

Ula longicornis Dietz ; Dietz 1921: 250. syn.nov.

Material examined: Holotype, pinned ♀: «O. Sacken» (white card, printed) «U. paupera» (white card, handwritten) «Type/ 10209» (white and red card, partly handwritten). Tip of the abdomen and all legs missing. Holotype, pinned ♂:»Hazleton, Pa./ Dr. Dietz Coll./ VII 6 '20" (white card, partly handwritten) «Holo/ type» (red card, partly handwritten) «HOLO-TYPE/ Ula/ longicornis/ W. G. Dietz/ 6416» (red card, partly handwritten). Left fore and hind leg missing; right mid leg broken; wings not intact. Other material: Nearctic: Alaska, Kenai July 24, 1952, D.L Carson, 2♂♂ (in Ottawa); Que. Cap. Bon Ami 10.8.1971, F. Brodo 1♀ (in Ottawa); Upper Carmanah Valley B.C. UTM:10U CJ 803006 10 IX-29 IX '91 (59) N. Winchester TZ MT5 2♂ (in Ottawa); Upper Carmanah Valley B.C. UTM:10U CJ 803006 28 VIII-9 IX 1991 (42) N. Winchester TZ MT5 1♀ (in Ottawa); Laniel, Que. 2 VI 1939 J.L. Hitchon 1♂ (in Ottawa); Lockeport, N.S. 1 VIII 1958 J.R. Vockeroth 1♂ (in Ottawa); Roundtop Mt, Sutton Que. 1300' 5.VI. 1963 J.R. Vockeroth 1♂ (in Ottawa); Shelburne, N.S. 10.VIII. 1958 J.R. Vockeroth 1♂ (in Ottawa); Curry, Alaska 28.VI. 1952 W.R. Mason 1♂ (in Ottawa); N.S. CBHNt.Pk. MacKentzie Mtn. 400m PG639848 2.VI. 1984 1♀ (in Ottawa); Trout LR B.C. 18.VIII.1937 H. Leech 1♀ (in Ottawa); Kitsumkalum lake 20m N. Terrace B.C. 31.V. 1960 C.H. Mann 1♀ (in Ottawa); Reindeer Depot. Mackenzie Delta 4.VIII 1948 W.J. Brown 1♂ (in Ottawa); Massachusetts, Charlement 1500'31.7. 1928 Alexander 1♂ (in Washington); Massachusetts, Becket VII.18. 1928 Crampton 1♂ (in Washington); Oregon, Cascades Odell Lake 6.8.1948 Alexander 1♂ (in Washington); Palaearctic: Finland. Sb: Savonranta 21.5.-18.6.1996 P. Martikainen 3♀♀ 2♂♂; Sb (in Jyväskylä): Savonranta, Muhamäki 4.9.-2.10.1996 P. Martikainen 4 ♂♂ 2♀♀ (in Jyväskylä); InL: Inari, Sarmitunturi 7.8.2002 J. Salmela 1♂ (in Jyväskylä); St: Jämijärvi, Uhrilähde 9.6.2001 J. Salmela 3♂♂ 1♀ (in Jyväskylä);. Poland. Krosno woj. (=Prov.); Bieszczady Nat'l Pk.; 27.ix.1991; J. Gelhaus, 3♂♂ (in Philadelphia); Krakow woj. (=Prov.); Mogilany 49°57'N, 19°53'E; 11.ix.1991; J. Stubbs, 1♂ (in Philadelphia); Liethuania. Varena distr., Puvociai river Gruda 1997.VII.1, S. Podenas, 1♀ (in Philadelphia).

Diagnosis: Body coloration yellowish brown to dark brown, antennae with dark flagellomeres, scape and pedicel pale. Wings with normal macrotrichia on wing membrane, faintly brown tinged, small cloud on R-M. Male terminalia with pointed gonostylus and ejaculatory apodeme of the aedeagal complex shorth and blunt. Female cerci upcurved, smooth.

Male. Head dark brown to black. Scape and pedicel yellowish brown, flagellomeres dark. Verticils generally shorter than respective segment. Flagellomeres relatively long (width/length ratio of third antennal segment 0.17-0.22), decreasing in length towards apex of antenna. Whole flagellum with pubescense.

Thorax yellowish brown to dark brown, dorsally

darker than laterally. Wings faintly brown tinged, normal macrotrichia on membrane. Pterostigma brown, small cloud on R-M. Coxae and trochanters yellow, femora yellowish brown, tibiae brown and tarsi dark brown. Halteres yellowish brown, knobs infuscated. Wing length 6.4-7.1 mm.

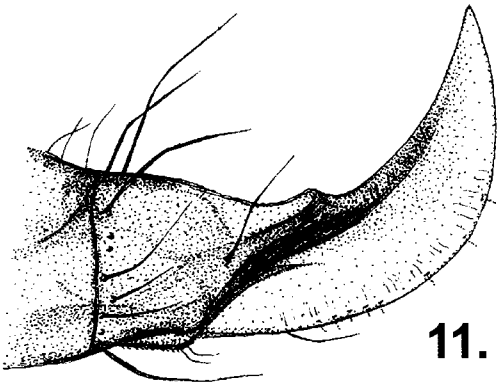
Abdomen brown. Caudal margin of tergite 9 evenly rounded, with a number of fine setae. Sternite 9 moderately notched. Hypopygium (Figure 8). Gonostylus pointed, slightly arcuated, bearing 7-11 dark, stout spines (Figure 9). Aedeagal complex apically tripartite, relatively small, in length shorter than gonocoxite (Figure 10), ejaculatory apodeme short and blunt. Aedeagus with a membrane like, blunt tip.

Female. Externally similar to the male. Wing length 6.9-7.1 mm, width/length ratio of third antennal segment ca. 0.28. Cerci (Figure 11) upcurved and smooth on the edges. Faintly chitinised median structures within the peripheral frame of vaginal apodeme (Figure 12).

Distribution: Widely distributed in the Holarctic region.

Discussion: *Ula sylvatica* is the only species of the genus with a Holarctic distribution. The species is quite easily distinguished from the other species, especially if terminalia are dissected.

Two new synonyms are established: *U. paupera* Osten-Sacken and *U. longicornis* Dietz. In the description of *U. paupera* Osten-Sacken (1869, p. 277) states: «In my former publication, I had identified this specimen with *Ula pilosa* Schum.; I prefer to give it another name now, as experience had taught me that such an identification, based upon a description and not upon an actual comparison of specimens, is not always safe.» According to the studied material, it is, however, clear that *U. paupera* is a synonym of *U. sylvatica*. Dietz (1921) based his description of *U. longicornis* on a single male, which he had compared to the *U. paupera* specimens collected from Hazleton, Pennsylvania. We have studied the *U. paupera* material (three specimens, see *U. elegans*, Material examined) and it appeared that the specimens actually belong to *U. elegans*; thus, Dietz (1921) did not compare his *U. longicornis* type to *U. paupera* but to *U. elegans*. In Alexander's collection one slide mounted *Ula*, is labelled as «Ula (Ula) longicornis Dtz./♂ ant;.../Tennessee,/ Great Smoky Mts./.../2000' –V-3.'38/ The Alexander Collection/ (... Williams)/ of Crane-Flies/ OVER 376x» (in Washington). The terminalia of the specimen are somewhat



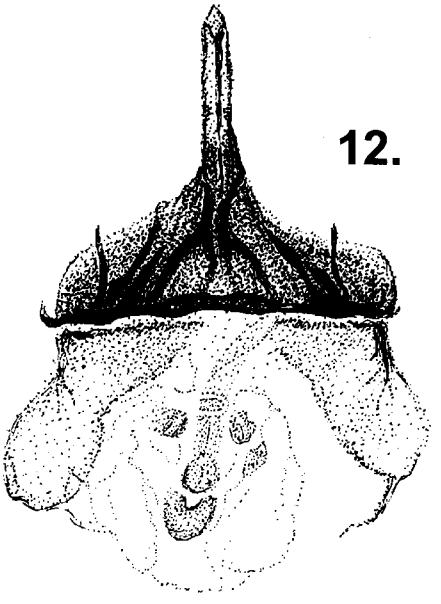


Figure 11-12. *Ula sylvatica* (Meigen): 11. Female cerci, lateral view (Finland). 12. Female vaginal apodeme, dorsal view (Canada).

disformed, but the aedeagus is identical to *U. sylvatica*.

Ula cincta Alexander

Figures 13, 14, 15, 16, 17

Alexander 1924: 573; Tokunaga, Ishida & Nobuchi 1954: 4 (see discussion in *Ula succincta*).

Material examined: Holotype: Pinned ♀ «Akan,/ Hokkaido,/ ix-3-1922/ T. Esaki» (white card, handwritten) «/HOLOTYPE/ Ula/ cincta/ C. P. Alexander» (in Washington) (red card, species name hand written). Fore legs missing. A slide: «Ula/ cincta/ Alex. ♀ Hokkaido, Japan,/ Akan,/ Sept. 3, 1922/ (Teiso Esaki)/ The Alexander Collection/ of Crane-Flies/ HOLOTYPE 2572». Left wing is on the slide. The present authors dissected the terminalia on a slide. Paratype, pinned ♀: «Teppetsu,/ Hokkaido/ IX-9-1922/ Teiso Esaki» (white card, handwritten) «PARATYPE/ Ula/ cincta/ C. P. Alexander» (blue card, species name handwritten). Other material: Japan, Shikoku, Mt. Turugi-Awa. 30.5. 1950, I. Ito, 1♂; Japan, Shikoku, Mt. Isizuki. 9.6. 1950, I. Ito 1♀; Japan No. Honshiu, Mori-Oka 1934 T. Kato 1♀ (all specimens in Washington).

Diagnosis: General coloration reddish brown to almost dark brown. Head dark, flagellomeres brown to dark brown, scape and pedicel light brown. Wings with normal macrotrichia, very slightly infuscated. Pterostigma lightbrown, centre not darker than wing membrane. Faintly indicated clouds on fork R_1-R_s and on vein R-M. Male aedeagal complex relatively large, aedeagus sharply pointed. Dististyle pointed, bearing nine dark, stout spines. Female cerci strongly upcurved, sharply pointed.

Male. Head dark brown, flagellomeres elongated, pubescent. Verticils longer or as long as respective segment. Third antennal segment width/length ratio is not measured.

Thorax reddish brown, somewhat darker dorsally than laterally, coxae and trochanters yellowish brown. Legs unicolorous, light brown. Wings with normal macrotrichia, membrane very slightly brown tinged. Pterostigma light brown, median part not darker that wing membrane. Faintly indicated clouds on fork R1-Rs and on vein R-M. Wing length 6.5-6.6 mm.

Abdomen brown. Hypopygium (Figure 13). Male aedeagal complex (Figure 14) relatively elongated, longer than gonocoxite and gonostylus together. Aedeagus long and thin, sharply pointed. Gonostylus pointed, bearing nine dark, stout spines (Figure 15).

Female. External characters like in the male. Third

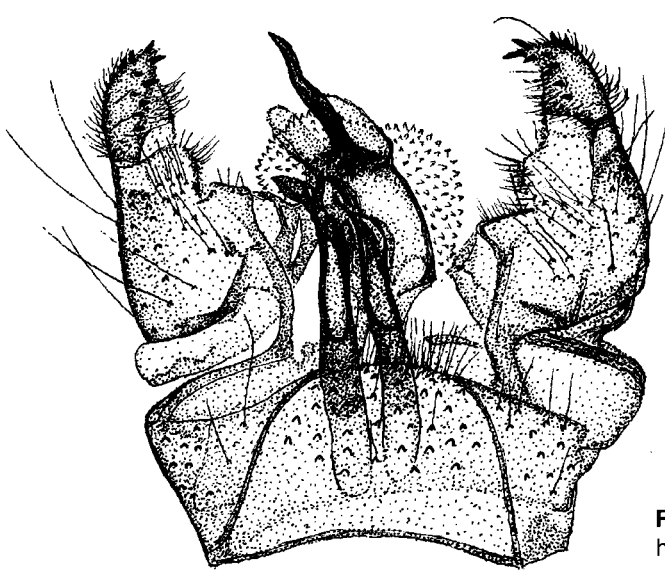


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Figure 13. *Ula cincta* Alexander, male hypopygium, dorsal view (Japan).

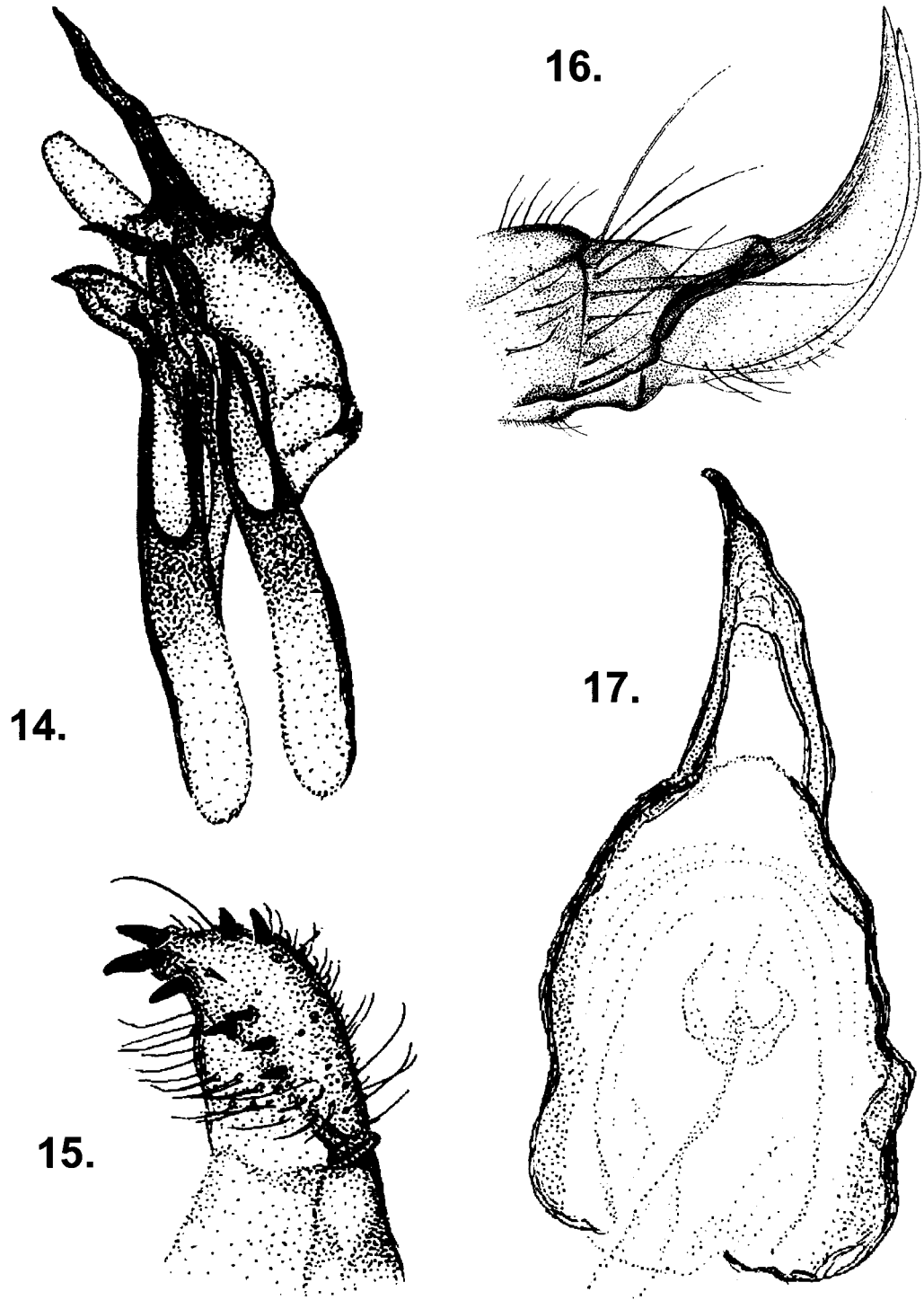

Figure 14-17. *Ula cincta* Alexander: 14. Male aedeagal complex, dorsal view (Japan); 15. Male gonostylus (Japan); 16. Female cerci, lateral view (Japan); 17. Female vaginal apodeme, dorsal view (Japan).

antennal segment width/length ratio 0.29. Wing length 6.7-7.2 mm. Cerci (Figure 16) strongly upcurved, tip rather thin and sharply pointed. Vaginal apodeme (Figure 17).

Distribution: Japan (records from Russian Far East need confirmation).

Discussion: The type material, two females, of *U. cincta* is examined and diagnostic characters are figured for the first time. An additional female from Alexander's collection was dissected, too, and found identical with the type material. In addition, Alexander (1954) reported *U. cincta* from Omogo Valley, Japan. We have studied the specimen (1♀) and it most probably belongs to *U. succincta* (the females of *U. succincta* and *U. mollisima* are very similar and practically inseparable; we assume that the latter species does not occur in the East Palaearctic). The male examined and figured here is externally very similar to the females of *U. cincta* (a pinned specimen; head, wing and terminalia slide mounted by C. P. Alexander). It is, however, somewhat uncertain weather the male actually does belong to *U. cincta*, and hence, one should be careful in the identification of Japanese specimens. In order to be sure about the identity of the male figured here, additional material and further studies are needed to find out real female-male associations of the species in question.

There are, actually, three insufficently known Japanese *Ula* species: *U. fungicola* Nobuchi 1954, *U. shiitakea* Nobuchi 1954 and *U. longicellata* Ishida 1954 (Tokunaga et al. 1954). *Ula fungicola* was redescribed by Savchenko (1983: p. 32, Fig. 3), but the figure of the species presents some other species [(J. Salmela, unpublished) The type of *U. fungicola*, a male, is slide mounted and in a rather poor condition, and it is not redescribed in this connection. The type of *U. fungicola* is deposited in the Laboratory of Entomology, Dept. of Agriculture, Kyoto Pref. University, Shimogamo, Kyoto; other type specimens, *U. shiitakea* and *U. longicellata*, are missing (H. Takada, pers.comm.)]. Hence, it would be extremely important to see more material from Japan and Russian Far East to solve the remaining taxonomic problems of the Palaearctic *Ula*.

Ula elegans Osten Sacken

Figures 18, 19, 20, 21, 22

Osten Sacken 1869: 276; Alexander 1966: 343; Alexander 1967: 89.

Material examined: Canada. Ont., Bells Corners 45°17'N, 75°48'W 3.6.1972 F. Brodo, 1♂ 1♀ (in

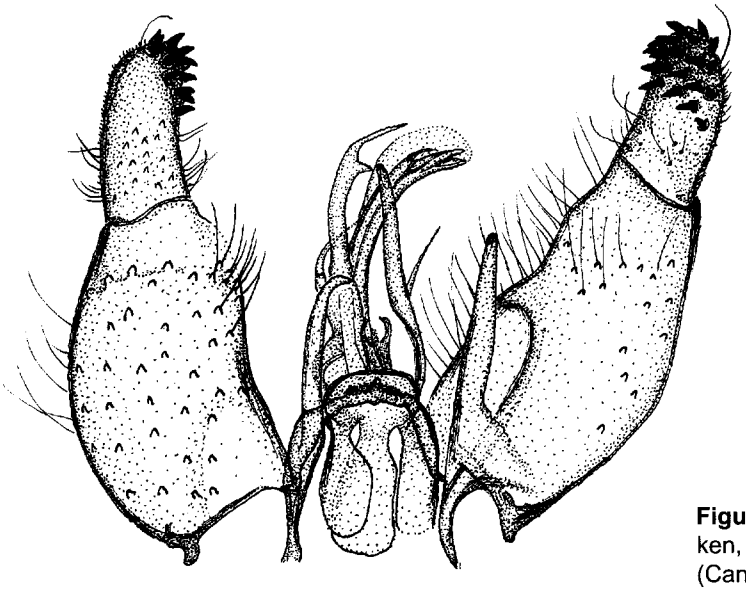

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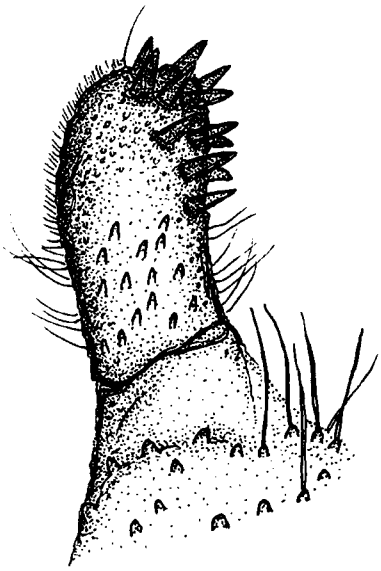
Figure 18. *Ula elegans* Osten Sacken, male hypopygium, dorsal view (Canada).



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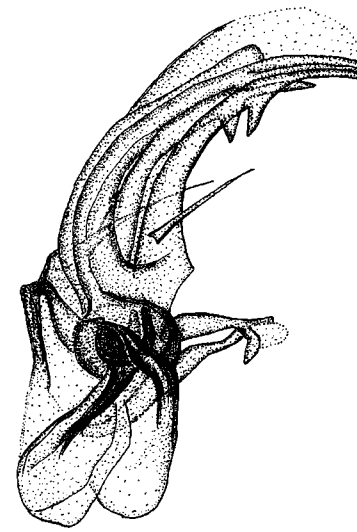

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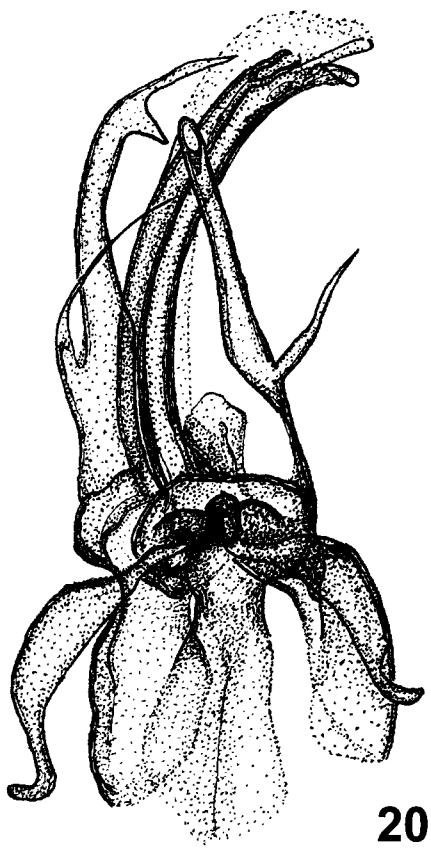

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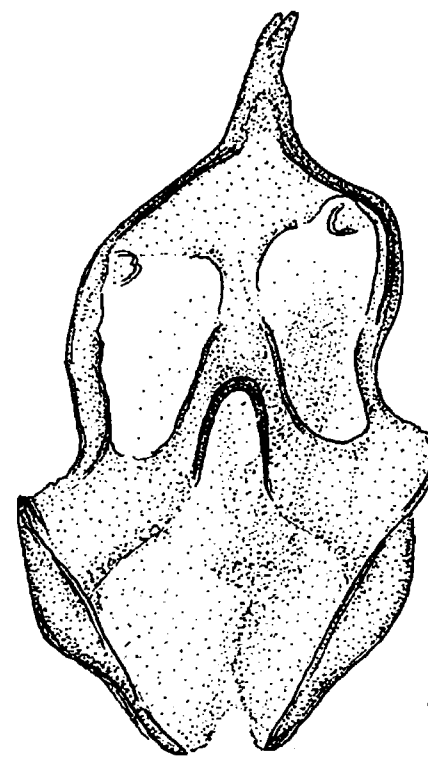

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Figure 19-22. *Ula elegans* Osten Sacken: 19. Male gonostylus (Canada); 20: Male aedeagal complex, dorsal view (Canada). 21. Male aedeagal complex, ventral view (USA); 22. Female vaginal apodeme, dorsal view (Canada).

Ottawa); P.Q. Gatineau, Pk. Meach L. stream 20.8.2000 F. Brodo, 2♀♀ (in Ottawa); ON Algonquin Pk. 17.8.1996 F. Brodo, 2♂♂ (in Ottawa); Laniel, Que. Cage # 70 25.7.1933, 1♀ (In Ottawa); Curry, Alaska 28.VI. 1952 W.R. Mason, 1♀ (in Ottawa). USA. Pennsylvania, Philadelphia Co.; Fairmount Park, 8.vi.1998; J.K. Gelhaus & W. Bouchard, 4♂♂ 3♀♀ (in Philadelphia). Ithaca, 1912, 1♀ (in Philadelphia); Hazleton, Pa. Dr Dietz coll. 25.5.1912, 1♂ (in Philadelphia); Hazleton, Pa. Dr Dietz coll. 29.9.1919, 1♂ (in Philadelphia); Hazleton, Pa. Dr Dietz coll. 11.9.1920, 1♂ (in Philadelphia); Forest Hill, NJ, May, 3♂♂ 1♀ (in Philadelphia); Rosslyn, Va, 25.8.1912, 1♂ (in Washington); Beaver Creek, Mont. 6300 ft. S.J. Hunter, August 1913, 1♀ (in Washington); Sacandaga Park, N.Y. Alexander, 1♀ (in Washington); Cayuga Lake, Ithaca N.Y. V.7-12, 1♂ (in Washington); Wilmington N.Y. VI.13.27 C.P. Alexander, 1♂ (in Washington).

Diagnosis: General coloration yellowish brown to dark brown. Antennae with scape and pedicel pale, flagellomeres dark. Wings covered by normal macrotrichia. Membrane only moderately infuscated, vague clouds on fork R_1-R_s, veins R-M (continuos to pt), M-M and M-Cu. Centre of pterostigma not darker than wing membrane. Male terminalia with aedeagus arcuated, dististyle rounded, with numerous dark, stout spines. Female cerci less pronouncedly upcurved.

Male. Head brown with grey pruinosity, flagellomeres relatively short (eg. compared to *U. sylvatica*), verticils longer than respective segment. Scape and pedicel yellowish brown, flagellomeres dark brown, pubescent. Third flagellomere width/length ratio 0.4.

Thorax generally brown to dark brown, laterally paler than dorsally. Halteres pale yellowish, knobs infuscated. Wings with normal macrotrichia on wing membrane; membrane only moderately infuscated. Pterostigma not darker than membrane, but darkened at either end. More or less dark clouds on fork R_1-R_s, veins R-M (continuos to pt), M-M and M-Cu. Wing length 6.5-6.7 mm Coxae and trochanters yellowish brown, legs brown to dark brown, darkening towards tarsi.

Abdomen brown, ventrally paler than dorsally. Caudal margin of sternite 9 with a flap like projection. Caudal margin of tergite 9 straight, with a number of fine hairs. Hypopygium (Figure 18). Aedeagus arcuated (Figure 20, 21), dististylus rounded, bearing 16-17 dark, stout spines (Figure 19).

Female. External characters like in the male. Third flagellomere width/length ratio 0.4. Wing length 7.4-8.4 mm. Cerci less pronouncedly upcurved. Vaginal apodeme (Figure 22).

Distribution: Nearctic.

Discussion: *Ula elegans* is easily separated from the other Nearctic species, namely *U. sylvatica:* the former species has rounded dististyle bearing 16-17 spines and the latter species pointed gonostyle bearing 7-11 spines. The vaginal apodeme of *U. elegans* is unipartite and moderately sclerotized, while the vaginal apodeme of *U. sylvatica* is bipartite and strongly sclerotized. The wing pattern is, however, very variable: some specimens have a clearly indicated dark pattern and some specimens may resemble *U. sylvatica*. For example, Dietz (specimens in Philadelphia) had misidentified some *U. elegans* specimens as *U. sylvatica* (see Discussion in *Ula sylvatica*). *Ula elegans* is closely related to *U. bolitophila*, a Palaearctic species, and for a comparison the male hypopygium (Figure 26) and dististylus (Figure 27) of the latter species are figured here.

Ula succincta Alexander

Alexander 1933a: 400; Tokunaga, Ishida & Nobuchi1954: 4.

Ula cincta Alexander; Nobuchi (in Tokunaga, Ishida & Nobuchi 1954): 4 (misidentification).

Ula ciscuncta Stary; Stary 1996: 235. syn.nov.

Material examined: holotype, ♂ dissected on a slide: «Ula/ succincta Al./ ♂ Japan,/ Mitake, Honshiu,/ May 10, '31/ (B. Oda) # 87/ The Alexander Collection/ of Crane-Flies/ HOLOTYPE 5220» (in Washington) (white card on a slide; a wing, a leg, hypopygium and a part of an antenna are mounted on the slide; other parts of the specimen are probably lost). Other material: Japan, Kyushu, Kunimiake 1200-1500 m V-29.52

Ito-Issiki 1♂ (in Washington); Sapporo, Japan Nov 9 '35 Okada 3♂♂ 3♀♀ (in Washington DC).

Diagnosis and description: see StarΩ (1996).

Distribution: Palaearctic: Japan, Slovakia.

Discussion: The species was described by Alexander (1933a) from Japan. Nobuchi in Tokunaga et al. (1954) redescribed *Ula cincta* Alexander, but the species in question must be *Ula succincta*. In the key constructed for male genitalia (Tokunaga et al. 1954, p. 3) *Ula succincta* and *U. cincta* are separated on a basis of lobes on the 9th segment: «Caudal margin of nineth tergite with a pair of small dorsal median lobes...*succincta* Alex. Caudal margin of nineth tergite without dorsal lobes, but with a pair of similar lobes on ventral side...*cincta* Alex». However, as we have seen the type of *Ula succincta*, the notion held by Tokunaga et al. (1954) was erraneous: *U. succincta* has small median lobes (or «sternite 9 with deep U-shaped median notch between two well-pronounced lobes» sensu Stary 1996) on the ventral side (sternite 9), not on the dorsal side. Stary (1996) in his description of *U. ciscuncta* suggested that the two species may well be conspecific. Unfortunately, the type of *U. succincta* was not located at that time and Stary (1996) preferred to describe a new species.

Ula comes Alexander

Figures 2, 23

Alexander 1935: 552.

Material examined: Holotype, pinned ♀: «WeiChow65 mi/ NWChengtu/ 5000ft 1933» (white card, partly handwritten, 5000ft overlined). «SzcehwanChina/ DCGraham/ VII-15-21T/ 9000 - 12500 ft» (white card, partly handwritten) «HOLOTYPE/ Ula/ comes/ C. P. Alexander» (red card, species name handwritten). Fore and hind legs missing. Abdomen is dissected on a slide by the present authors.

Diagnosis and description: see Alexander (1935).

Vaginal apodeme (Figure 23) and wing pattern (Figure 2).

Discussion. The species is known from the type specimen (a female) only. Male is unknown. Vaginal apodeme is here illustrated for the first time. The shape of the apodeme is quite characteristic and there should be no problems to associate male specimens to the females.

Ula provecta Alexander

Figures 24, 25

Alexander 1936: 243.

Material examined: Holotype, pinned ♀:»Mt Omei, W. China/ alt 5500 - 11000 ft/ aug. 16-20 1934/ Graham». (white card, partly handwritten) «HOLOTYPE/ Ula/ provecta/ C. P. Alexander» (red card, species name hand written). Left fore and middle legs left, other legs missing; right antennae missing. Abdomen is dissected on a slide by the present authors.

Diagnosis and description, see Alexander (1936).

Vaginal apodeme (Figure 25) and cerci (Figure 24).

Discussion. The species is known from the type

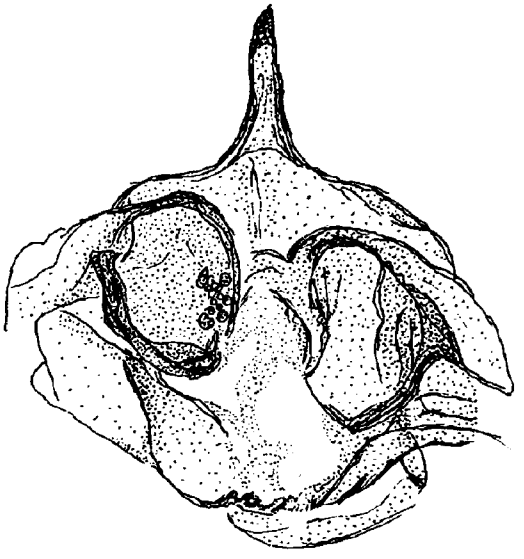

Figure 23. *Ula comes* Alexander, female vaginal apodeme, dorsal view (holotype).

specimen (a female) only. Vaginal apodeme is here illustrated for the first time. The shape of the apodeme (and the cerci; both ventral and dorsal edges serrated) is quite characteristic and there should be no problems to associate male specimens to the females.

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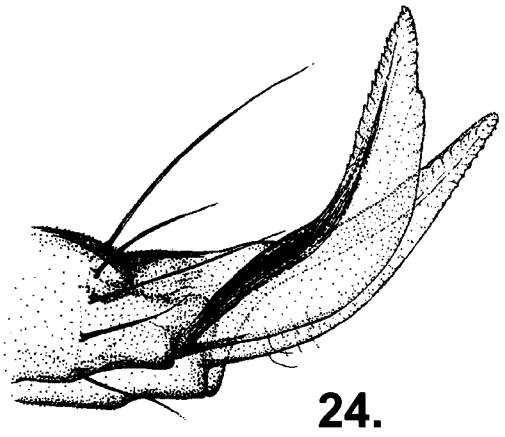

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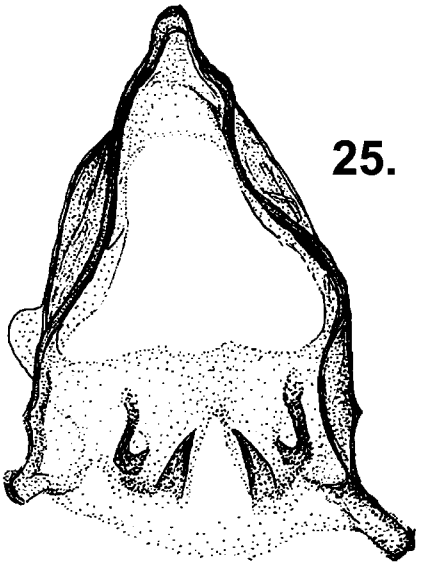

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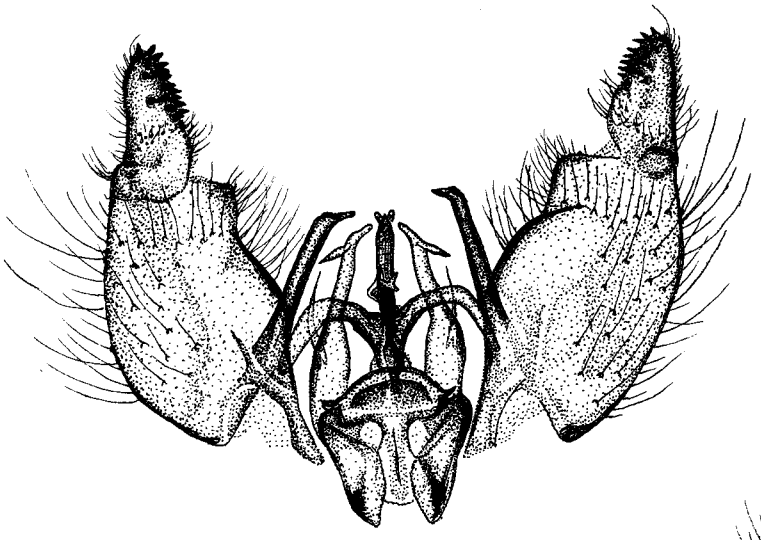
Figure 24-25. *Ula provecta* Alexander, 24: Female cerci, lateral view (holotype); 25. Female vaginal apodeme, dorsal view (holotype).



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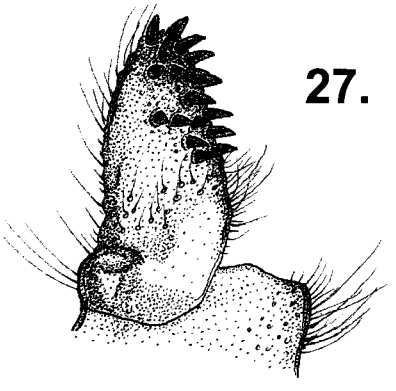

27.

Figure 26-27. *Ula bolitophila* Loew: 26. Male hypopygium, dorsal view (Finland); 27. Male gonostylus (Finland).

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Revision of six northern species of the *Isotoma viridis* Bourlet, 1839 complex (Collembola, Isotomidae)

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Fjellberg, A. 2003. Revision of six northern species of the *Isotoma viridis* Bourlet, 1839 complex (Collembola, Isotomidae). Norw. J. Entomol. 50, 91-98.

New diagnostic characters and an identification key is given to *Isotoma viridis* Bourlet, 1839, *I. riparia* (Nicolet, 1842), *I. caerulea* Bourlet, 1839, *I. anglicana* Lubbock, 1873, *I. mackenziana* (Hammer, 1953) n. comb., *I. arctica* Schött, 1893. Main groups may be recognised by sensillary and manubrial chaetotaxy in the 1st.instar juvenile.

Key words: Collembola, *Isotoma viridis*-complex, taxonomy, identification key.

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INTRODUCTION

Members of the *Isotoma viridis* complex are among the most widespread and common species of Collembola on the northern hemisphere. Their large size, up to about 5 mm, and strong colour make them conspicious, even to the unexperienced collector. They are often observed on snow in winter and are abundant in man-made habitats like gardens and farmlands. The standard handbook on European Collembola, Gisin's (1960) «Collembolenfauna Europas», lists only *viridis* as the single valid species, but also refers to five named colour varieties and 15 more or less reasonable synonyms. In his monumental work, Stach (1947) lists more than 30 synonyms. Since Palissa (1960) and Yosii (1963) pointed to structural differences in the manubrial teeth, it has been custom to treat the taxon *Isotoma anglicana* Lubbock, 1862 as a separate species (Fjellberg 1980). Simonsen et al. (1999) provided biochemical, ecological and morphological evidences for giving species status to *viridis*, *anglicana* and the characteristically coloured *riparia* Nicolet, 1841.

Simonsen et al. (1999) found indications of two biochemical forms of *anglicana*. The present paper reports further studies of *anglicana*, including observations of the first instar juveniles and unpublished characters (differentiation in dorsal manubrial macrochaetae). The new evidence clearly demonstrates that there are indeed two different species covered by the present consept of «*anglicana*». An additional third species of the *anglicana* group was found when the odd North American species *Proisotoma mackenziana* Hammer, 1953 was re-examined, giving support to Christiansen & Bellinger's (1980 p. 571) statement: «This unique form probably does not belong in the genus *Proisotoma*». Finally Schött's (1893) *arctica*, originally published as a variety of *viridis*, is given species status, following Potapov (2001).

The purpose of the present paper is to present new morphological characters which discriminates the species most often seen by European workers, and to give a platform for future revisions of the *viridis*-group.

The material for the present study was accumulated during many years of collecting activity in the Holarctic Region and also generated from collegial exchange of samples.

MORPHODIAGNOSTIC CHARACTERS

Colour pattern

The described colour «varieties» of *viridis* are numerous and the taxonomic status of most of them are still unclear. Since the discovery of Carapelli et al. (1995) that colour forms of *Isotomurus* are indeed good genetic species, it is reason to believe that the same will be true also for colour forms of *Isotoma* species. In the present work only *riparia* has a well marked colour pattern which alone may identify the species (Figure 8). In general colour pattern and intensity of pigmentation develop during the growth of the individual. The colour referes to specimens which have been stored in alcohol for some time.

The labral papillae

The differentiation of the labral papillae has been used to separate *viridis* and *anglicana* (Fjellberg 1980, Simonsen et al. 1999, Potapov 2001). In the present study the variation proved to be so large that the diagnostic value of the carater becomes doubtful.

The shape of claws

All members of the *viridis*-group have two inner teeth on unguis and one corner tooth on unguiculus. The shape of the claws develops during growth of the individual, and specific differences are best observed in adult specimens. In the presently treated species only *riparia* and *arctica* have claw characteristics which are clear enough to be of diagnostic value.

Manubrial ventroapical teeth

The «double» teeth of the manubrial thickening (Figure 2) of certain species is a good diagnostic character. Adults should be examined as small juveniles (in particular the 1st. instar) are atypical.

Manubrial dorsal macrochaetae

The differentiation of the dorsal macrochaetae on manubrium is a prime diagnostic character which is already evident in the 1.instar juvenile. Two patterns exist: Either the inner proximal macrochaeta (A) is longer than the outer (B), or the other way around. Also the relative positions of the two setae are different (Figures 3-4). The first pattern is displayed by *anglicana* and *mackenziana*, while the other species show the second pattern.

Manubrial ventroapical setae of 1st. instar juvenile

Two patterns exist: Either the 1st. instar juvenile has 1+1 setae (Figure 6) or none. The first condition is displayed by most species, while only *anglicana* and *mackenziana* are devoid of setae. The 2.instar of both groups have many pairs of setae (i.e. *anglicana/mackenziana* never display 1+1).

The diagnostic evidence of the character is also supported by observations from the related genus *Isotomurus*: Most species of the *palustris*-complex have no ventroapicals in the 1.instar juvenile. Only the odd species *fucicolus* has 1+1.

Dental dorsobasal macrochaetae

Yosii (1963) was the first to show that the presence of three dorsobasal macrochaetae on dens was a diagnostic character of *anglicana* (Figure 3). The present study shows that *mackenziana* also has three macrochaetae, while other species have two.

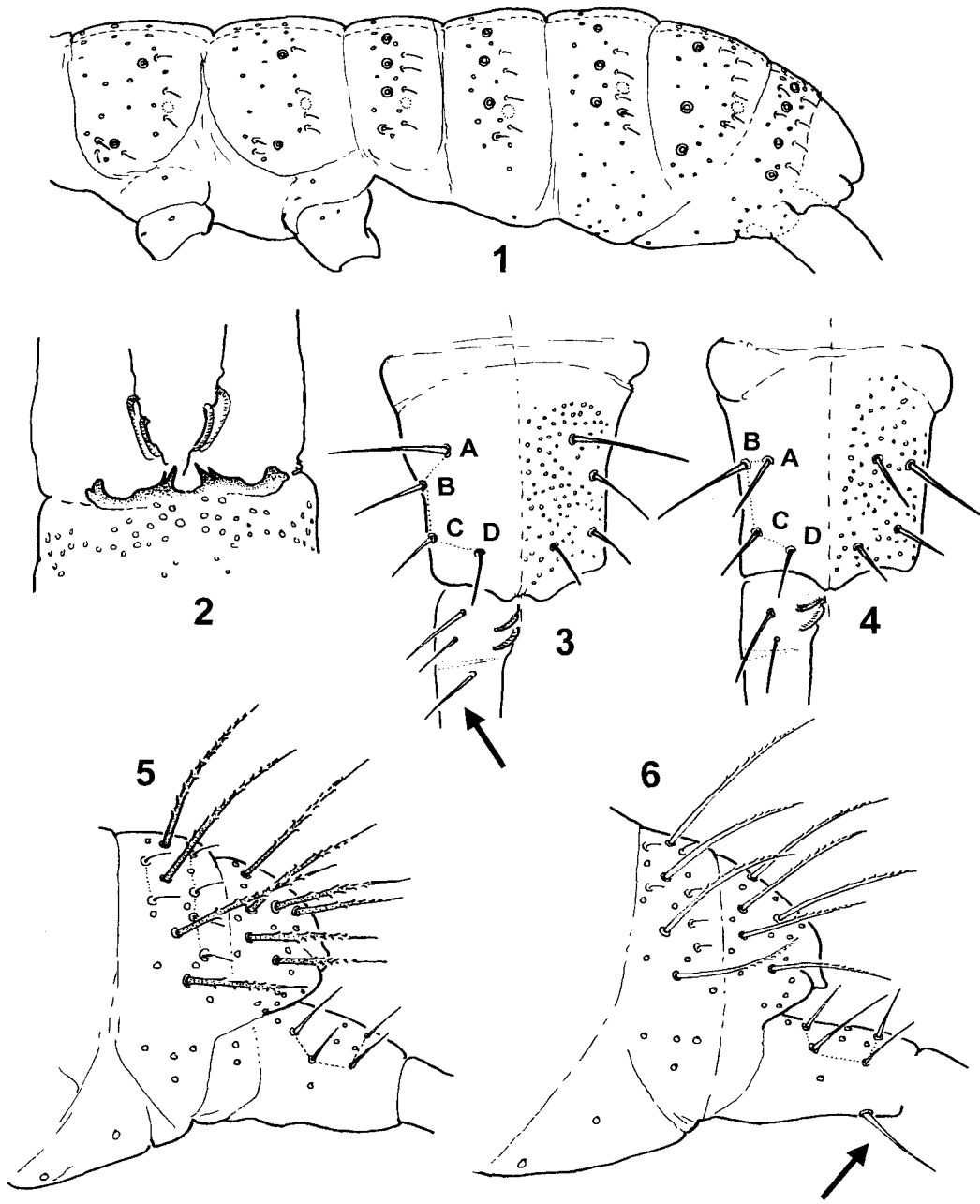
Sensilla of the tergites

The number and position of sensilla on the tergites is a character of high diagnostic value in Isotomidae (Potapov 1989). In the *viridis*-group two patters exist: The North American species *mackenziana* and *arctica* show a distribution on Th.2-Abd.3 like 77/666 (including the spine-like microsensilla), while other species have 66/555 (Figure 1). The patterns are most easily observed in the 1.instar juvenile. In adults the abundant cover of normal setae makes observation difficult. Number of sensilla on Abd.4-5 is more irregular and tends to increase in large individuals.

DIAGNOSIS OF THE SPECIES

Members of the *viridis*-group share the following characteristics:

Size up to 3-4 mm or larger, no significant differences between species. Body with long, serrated macrochaetae. Base of setae glandular. Ocelli 8+8.



Figures 1-6. Morphology of *Isotoma* species. **1.** *anglicana*, sensillary chaetotaxy of 1st. instar juvenile (dotted circles indicate position of additional sensilla in *mackenziana/arctica*); **2.** *anglicana*, ventroapical part of manubrium with bispinose teeth; **3.** *anglicana*, primary macrochaeta (A-D) on dorsal side of manubrium, arrow points to the 3rd. dorsobasal macrochaeta on dens; **4.** *caerulea*, ditto; **5.** *anglicana*, chaetotaxy of Abd.5-6 in 1st. instar juvenile; **6.** *caerulea*, ditto, note presence of ventroapical seta on manubrium (arrow).

PAO roundish, smaller than nearest ocellus. Maxillae with short lamellae which have no long marginal cilia. Maxillary palp bifurcate. Claws with two inner teeth on unguis. Tibiotarsi with 8 apical setae (A_{1-7}, T_1), sometimes more in large individuals. Mucro with 3 subequal teeth, a minute fourth tooth often present on the ventral edge. Manubrium with many strong, almost spine-like, smooth setae in ventroapical field. Males generally present.

Isotoma viridis Bourlet, 1839

Bourlet 1839: 401.

Figure 13.

Type locality: Europe (not specified).

Colour variable from uniformly green or yellowish to dark brown or red. Posterior edges of tergites often darkened. Labrum with 4 apical folds, lateral pair usually much larger than median. The 1.instar juvenile with 1+1 ventroapical manubrial setae, sensilla of Th.2-Abd.3 as 66/555. Teeth of manubrial thickening simple. Manubrial macrochaeta A<B. Dens with two dorsobasal macrochaetae.

As defined above, *viridis* becomes a «residual taxon» without peculiar characteristics. Small juveniles with weak pigmentation and premature manubrial teeth can hardly be separated from juveniles of *riparia* and *caerulea*.

The reported distribution of the species is worldwide, but future work may well conclude that several species are involved. Potapov (2001) gives a review of the distribution and biology of the species.

Isotoma riparia (Nicolet, 1842)

Desoria riparia Nicolet, 1842: 62.

Figure 8.

Type locality: France/Switzerland.

Typically pigmented specimens with broad middorsal longitudinal band and large lateral spots on thorax and abdomen (Figure 8). Large individuals with almost confluent pattern. In some populations the dark colour is poorly developed and only traces of the pattern is visible. Small individuals often with middorsal band only, lateral marks not developed. Lateral pair of labral folds much larger than median. The 1st. instar juvenile with 1+1 ventroapical setae on manubrium, sensilla of Th.2-Abd.3 as 66/555. Manubrial teeth simply pointed. Manubrial macrochaeta A<B. Dens with two dorsobasal macrochaetae. Claws in large individuals with lateral lamellae broadly expanded towards base (Figure 12).

Apart from colour pattern, the species is very similar to *viridis*. Simonsen et al. (1999) found sharp differences in isozyme composition of *viridis* and *riparia*, giving support to the species status of the taxa. *I. riparia* is more hygrophilous than other species of the group, being frequent in wet meadows along seashores and in other wetland, never found in warm and dry sites. The expanded claws may be an adaptation to wet surface, like the pilosity of dens which appears stiffer than in related species.

Distribution is incompletely know, but the species appears to be most common in northern Europe (Potapov 2001).

Isotoma caerulea Bourlet, 1839

Bourlet 1839: 401

Figure 6.

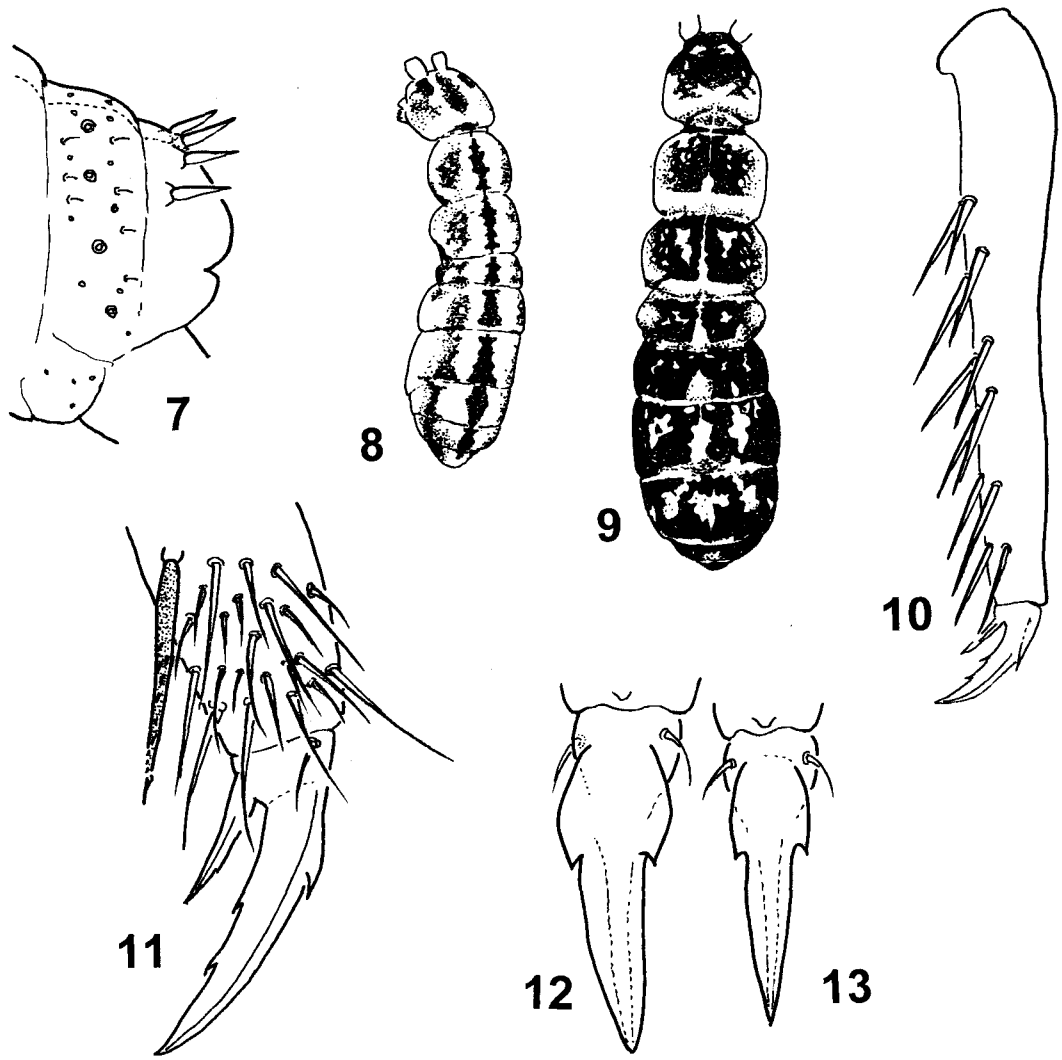
Type locality: Europe (not specified).

Colour variable, fullgrown specimens bluish or brownish red. Specimens of medium size (1.0 mm) grayish green. Labral folds variable, laterals usually not much larger than medians. The 1.instar juvenile with 1+1 ventroapical setae on manubrium, sensilla of Th.2-Abd.3 as 66/555. Manubrial teeth bispinose (Figure 2), indistinct in small juveniles. Manubrial macrochaeta A<B. Dens with two dorsobasal macrochaetae.

Apart from the bispinose manubrial teeth, almost inseparable from *viridis*. The labral folds are not reliable as diagnostic character. Until now *caerulea* has been regarded as a synonym of *anglicana*.

The latter species, however, differs from other European species by a set of unique characters (see below).

Due to the taxonomic confusion the distribution of *caerulea* is incompletely know, but apparently covers a wide range. I have seen specimens from most of Western Europe (Norway, Sweden, Denmark, Latvia, Germany, England, Ireland, Belgium) and also from Greenland and USA (Utah, Vermont, Alaska). Norwegian records indicate a preference for dry, sandy meadows along seashores.



Figures 7-13. Morphology of *Isotoma* species. **7.** *mackenziana*, Abd.5-6 of 1st. instar juvenile; **8.** *riparia*, colour pattern of specimen from S.Norway; **9.** *arctica*, colour pattern of large specimen (4.5 mm) from interior Alaska (E of Cantwell); **10.** *arctica*, 3rd. leg with enlarged setae on inners side of tibiotarsus; **11.** *arctica*, claw and apical part of tibiotarsus; **12.** *riparia*, claw; **13.** *viridis*, claw.

Isotoma anglicana Lubbock, 1873

Lubbock 1873: 596.

Figures 1-3, 5.

Type locality: England.

Colour variable, usually uniformly blue or violet of variable intensity. Halfgrown individuals (1.0 mm) with distinct bluish pigmentation. Labral papilla variable, laterals often only slightly larger than medians. The 1st. instar juvenile without ventroapical setae on manubrium, dorsal sensilla of Th.2-Abd.3 as 66/555 (Figure 1). Sensilla of abdominal tergites slender, setaceous, apart from the lateral pair which are thickened, spine-like. Manubrial teeth bispinose (Figure 2). Manubrium with macrochaeta A>B (Figure 3). Dens with three macrochaeta in dorsobasal part (Figure 3). Small juveniles (1st. instar) with stiff, strongly serrated macrochaeta on tip of abdomen (Figure 5).

The absence of manubrial setae in the 1st. instar juvenile and the presence of three dorsobasal macrochaetae on dens are unique characters among the European members of the *viridis* group. The extraordinary spike-like macrochaetae on tip of abdomen in the juvenile (Figure 5) is probably a «pseudoecomorphic» trait indicating genetic affinity to the N.American *mackenziana* and unknown European species reported by Potapov (2001).

The distribution of *anglicana* is incompletely known, but the species apparently penetrates further to the north than related species. In Spitsbergen it is the only representative of *Isotoma* s.str., and it is also common in Greenland (Fjellberg unpubl.). Specimens have otherwise been seen from Norway, Denmark, Russia (Moscow), Germany and England. Norwegian records indicate a preference for humus-rich soils, both in forest and in open land, often in farmland and other cultivated ground. It seems to avoid the dry, sandy habitats of *caerulea* (see above).

Isotoma mackenziana (Hammer, 1953) n. comb.

Proisotoma mackenziana Hammer, 1953: 50.

Figure 7.

Type locality: Canada (Mackenzie River delta).

Colour of adults bluish red, juveniles paler. Labral papillae unequal, laterals slightly larger than medians. The 1st. instar juvenile without ventroapical setae on manubrium, Abd.6 with 4 stright spine-like setae (transformed macrochaetae, Figure 7). Sensilla of Th.2-Abd.3 as 66/777. Upper sensilla of the abdominal tergites spine-like, not setaceous. Manubrial teeth bispinose (Figure 2). Manubrium with macrochaeta A>B. Dens with three dorsobasal macrochaetae.

The species was originally described from Northern Canada by Hammer (1953) as a *Proisotoma*. Christiansen & Bellinger (1980) stated that the single type specimen was immature and probably not a *Proisotoma*. In 1996 I had a sample from Igloolik (Canada), collected ultimo August (K. Niwranski leg.), which contained numerous 1st. instar juveniles fitting the description of *mackenziana*. Specimens in ecdysis from 1st. to 2nd. instar proved that the spines became normal macrochaetae after the moult. Adults and halfgrown specimens in the same sample clearly indicated that *mackenziana* was almost identical to *anglicana*, differing only by presence of the Abd.6 spines and one more sensillum on the tergites of Th.2-Abd.3. Possibly also the spine-like sensilla of adult *mackenziana* is a diagnostic character.

Distribution of the species is unclear due to taxonomic confusion. Apart from Canada and Alaska, Christiansen & Bellinger (1980) give a record from Iowa. In my collection I have adult «*anglicana*» from Indiana and Pennsylvania which may actually be *mackenziana* or related forms. The basic sensillary chaetotaxy can only be clearly seen in small juveniles which are absent in the samples.

Note: Potapov (2001: 283) reports juvenile specimens of the *viridis* group from S. Russia which have spines on Abd.6 and no ventral manubrial

setae. They are probably identical to *Tetracanthura mirabilis* Martynova, 1971. Also other species of *Tetracanthura* are probably juvenile *Isotoma* related to *anglicana/mackenziana*. The same applies to juvenile *viridis* s.lat. bearing 4 spines on Abd.6, reported from Greece by Najt (1982).

Isotoma arctica Schött, 1893

Isotoma viridis var. *arctica* Schött, 1893: 61.

Figures 9-11.

Type locality: Port Clarence, Alaska.

Body with a characteristic pattern of dark (black) spots and unpigmented fields (Figure 9). Median line of Th.2-3 and anterior abdominal segments unpigmented, in very dark specimens only as a narrow white line. Lateral papillae of labrum much large than medians. The 1.instar juvenile with 1+1 ventroapical setae on manubrium. Sensilla of Th.2-Abd.3 as 66/777. Manubrium with simple ventroapical teeth, dorsal macrochaeta A<B. Dens with two dorsobasal macrochaetae. Inner side of tibiotarsi with enlarged, spine-like serrated setae. In large specimens these are almost as thick as the very narrow unguiculus (Figures 10-11).

Potapov (2001) gave species rank to the old «variety» *arctica*, stressing the diagnostic value of the narrow unguiculus and the enlarged inner tibiotarsal setae. Small specimens with diffuse colour pattern may be hard to distinguish from *viridis*. The 1st. instar juvenile is recognised by increased number of sensilla.

Specimens have been recorded from tundra habitats on both sides of the Bering Strait. On the Alaskan side also in forest taiga near Fairbanks, extending south to Talkeetna and Paxon (alpine tundra).

Acknowledgements. The diagnostic significance of the dorsal manubrial macrochaetae in the *viridis* group was reported to me several years ago by Michail Potapov, Moscow. It was never published, however, and I am much in debt to Mischa for letting me introduce the character now. Also I want to thank Peter G. Kevan, Guelph, for sending specimens of *mackenziana* from Igloolik.

Key to species

1. Ventroapical manubrial teeth bispinose (Figure 2) 2
- Manubrial teeth simply pointed 4

2. Manubrial seta A>B, dens with 3 dorsobasal macrochaetae (Figure 3) 3
- Manubrial seta A<B, dens with 2 dorsobasal macrochaetae (Figure 4) ..... *caerulea*

3. Sensilla of Th.2-Abd.3 as 66/555 (Figure 1), 1st. instar juvenile without spine-like setae on Abd.6 ..... *anglicana*
- Sensilla of Th.2-Abd.3 as 77/666. 1st. instar juvenile with 4 spines on Abd.6 (Figure 7) . *mackenziana*

4. Body with 3-striped pattern (Figure 8), claws expanded at base (Figure 12) ..... *riparia*
- Body uniformly coloured or with different pattern. Claws normal (Figure 13) 5

5. Sensilla of Th.2-Abd.3 as 66/555. Inner side of tibiotarsi without enlarged setae. Unguiculus broad ..... *viridis*
- Sensilla of Th.2-Abd.3 as 77/555. Inner side of tibiotarsi with enlarged setae (Figure 10). Claws with very narrow unguiculus (Figure 11) ..... *arctica*

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Description of *Eupeodes biciki* spec. nov. (Diptera, Syrphidae) from northern Norway

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Nielsen, T.R. 2003. Description of *Eupeodes biciki* spec. nov. (Diptera, Syrphidae) from northern Norway. Norw. J. Entomol. 50, 99-103.

Eupeodes biciki spec.nov. is described from Fløyfjell, Tromsø, northern Norway. The species is figured and compared with the related species *E. lundbecki* (Soot-Ryen, 1946) and *E. nielseni* (Du√ek & Láska, 1976).

Key words: Diptera, Syrphidae, *Eupeodes*, new species, Norway.

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INTRODUCTION

The European species of genus *Eupeodes* Osten Sacken (previously *Metasyrphus* Matsumura) has recently been revised by Mazánek & al. (1998, 1999 a,b,c), including also a critical study of the Norwegian fauna, with a key to the twelve species. The new species, described here, is a result from this revision.

METHODS

Measurements were made by using ocular micrometer in a Carl Zeiss Jena Citoval 2 microscope. The width of face was measured at midpoint between antennae and facial tubercle. The length and width of clypeus were measured in middle lines. The length of the third antennal segment was measured on the inner side, from its apex to the mid-apex of the second antennal segment. The male terminalia were figured by using a demonstration tube on a Carl Zeiss Jena Laboval 3 microscope.

THE SPECIES

Eupeodes biciki spec. nov.

Type: Male dated «Tromsø, Fløyfjell 1.7.1982, A. Fjellberg». Fløyfjell is a nearly 700 m high mountain east of Tromsø city. Most of the Fløyfjell area is situated in the low alpine zone. The coordinates are 69°38'N, 19°0'E.

The terminalia have been dissected and are stored in glycerol in a plastic microvial on the same pin. The specimen is deposited in the collections of Tromsø Museum, University of Tromsø.

Diagnosis: The holotype is medium sized, about the size of *E. corollae* (Fabricius, 1794). Face and frons broad, eye angle about 110°. Scutum and scutellum with yellowish white hairs. Wing membrane covered by microtrichia on apical two thirds, alula with a large bare area in the middle. Tergite 5 yellow with only a black spot in the middle, leaving the lateral margins yellow.

Description

Male

Head: Figure 1A, B. Angle of approximation of eyes about 110°. Eye contiguity rather long, shortest distance between anterior ocellus and posterior point of frontal triangle 0.38 mm. Frons yellow with light greyish dusting, the hairs brownish black. Antennae (Figure 1C) brownish black, 3rd joint narrowly reddish brown below, a little longer than wide (0.38 mm/0.35 mm) and distinctly longer than 1st and 2nd segment together (0.29

mm). Face very broad, about 55 % of width of head, shiny yellow, yellow haired, with a brownish black median stripe. This colour continues along the mouth-edge. Genae is also brownish black. Clypeus about twice as long as wide. Postocular orbit with greyish yellow dusting, all yellow haired, near vertex a little narrower than half of its maximal width. Vertical triangle blackish, brown haired.

Thorax: Scutum shining bluish black with very light brown dusting. The hairs pale yellow. Scutellum dirty yellow, the basal corners bluish black, the hairs pale yellow, about 0.35 – 0.4 mm long on disc, on margins on scutellum almost two times longer and tortuous in their apical parts. Pleurae shining metallic black with bluish and brassy reflections, the hairs yellow white. Wings: wing membrane covered by microtrichiae, except for about the basal 1/3. About 2/3 of 2nd basal cell bare and alula with a large central area without microtrichiae. Halters pale yellow. Legs yellow, except for about basal 40% of femora which is black. The long hairs behind on fore and middle femora mainly black, but there are some yellow hairs towards base, and the hairs distinctly (almost two times) longer than width of femora (Figure 2A).

Abdomen: Figure 2B. Yellow spots on tergites 3 and 4 separated in mid-line and from lateral margins of tergites. Tergite 4 narrowly yellow on posterior margin. Tergite 5 yellow except for a dark spot in the middle. Sternites yellow, sternite 2-4 with a subrectangular blackish spot in the middle. Terminalia (Figure 3A-D) small, with a very high and dorsally angular base of aedeagus, and with reduced distal lobes of hypandrium over the paramere connection. Paramere with very small teeth at base, about 0.012 mm. Hypandrium without lingula.

Size: body length (from frons till tip of abdomen) 8.8 mm, wing length 7.3 mm.

Female

Unknown.

Etymology

The species is named after professor, RNDr. Vitězslav Bičík, Ph.D., Olomouc, Czech Republic, for his generous support and participation in the revision of European *Eupeodes*.

DISCUSSION

The present new species is described on the basis of one male only, which might be disputable. The type specimen of *E. biciki* differs, however, clearly from similar species in the following way: the male has a very wide frons and may be confused only with *E. lundbecki* (Soot-Ryen, 1946) and *E. nielseni* (Dušek & Láska, 1976).

When compared with *E. lundbecki*, *E. biciki* has a greater part of the wing covered by microtrichiae (less than 40% in *lundbecki*), and in *biciki* the eye facets are of about the same size (upper half of the eye has an area of enlarged facets in *lundbecki*). *E. biciki* separates from *E. nielseni* in the yellow hairs of scutellum and postocular orbit, and in the broad yellow lateral margins of tergite 5. In *E. nielseni* the majority or all hairs on scutellum are black, postocular orbit with a row of long black hairs near vertex, and also the lateral margins of tergite 5 are black.

The male terminalia of *E. biciki* has great similarity to those of *E. nielseni*, but separates in a very high and angular base of aedeagus and reduced lobes of hypandrium over the paramere connection.

Furthermore, *E. biciki* differs from other species of the genus in the presence of very long, predominantly black hairs on the hind side of the femora, and in all yellow hairs on the scutellum. That combination is unique within *Eupeodes* (Mazánek pers. comm.).

The female of *E. biciki* sp.n. is expected to have a broad face and a long clypeus. Only the female of *E. tirolensis* (Dušek & Láska, 1973) has similar features on the head, but the obliquity of the spots on tergite 3 and 4 of that species will be different. The presence or absence of dust spots on frons cannot be predicted.

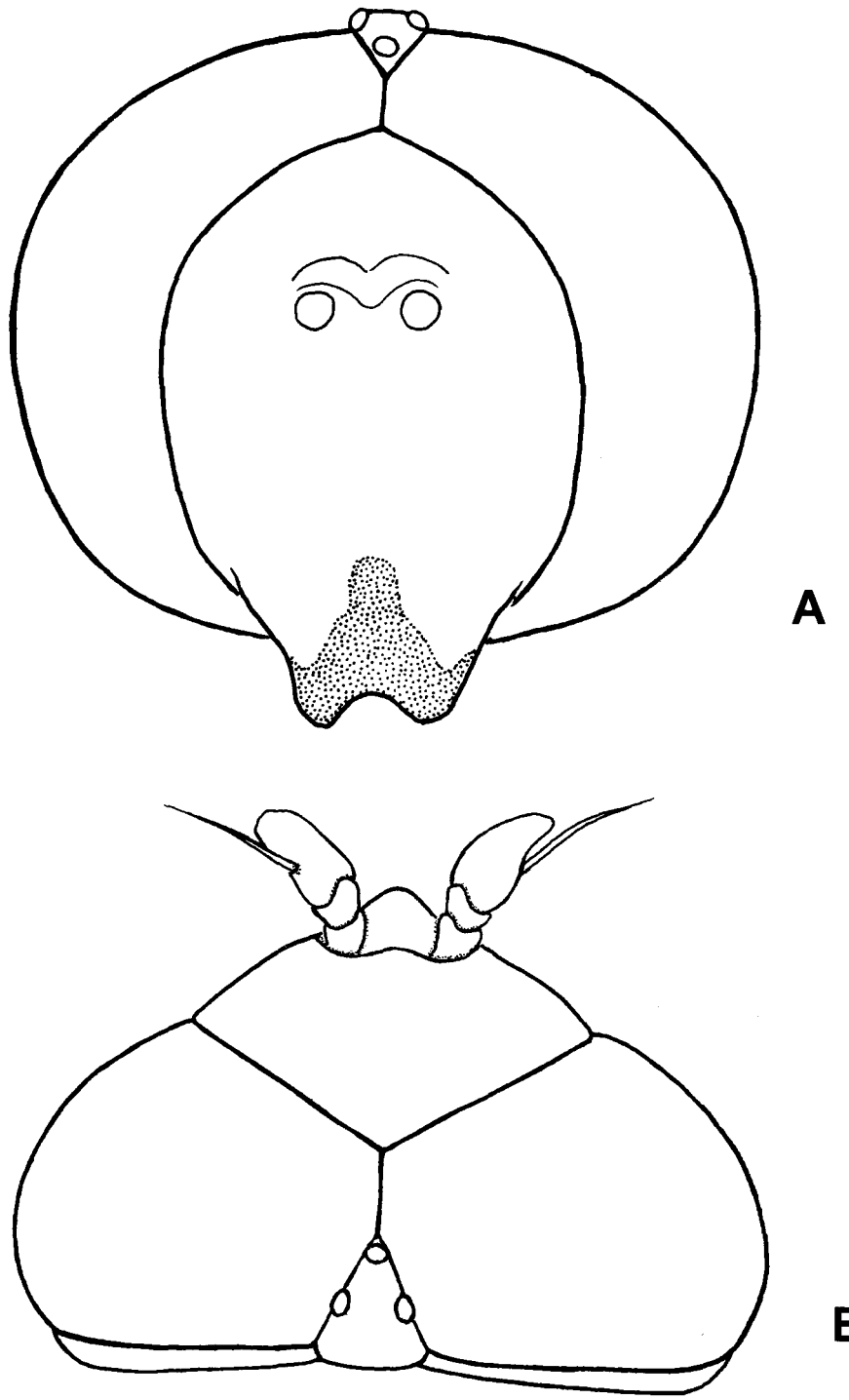


Figure 1A-B. *Eupeodes biciki* spec. nov. A: head in frontal view; B: head in dorsal view.

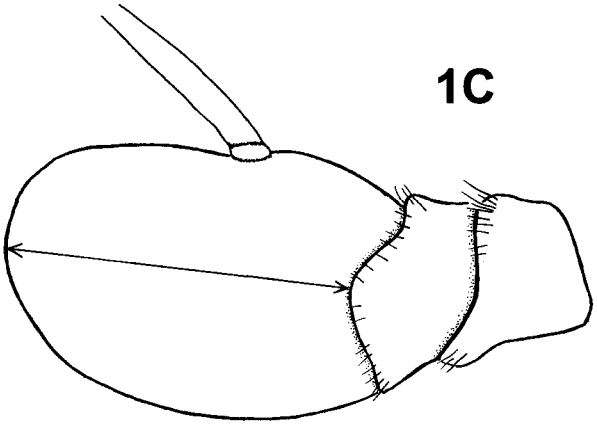
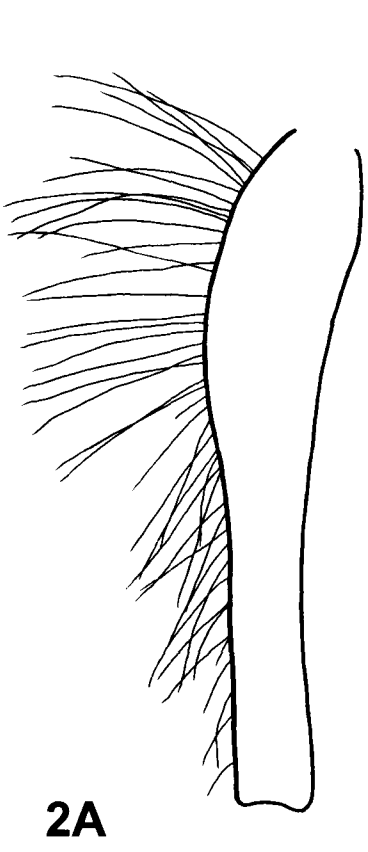


Figure 1C. *Eupeodes biciki* spec. nov.: antenna, with length measurement of 3rd segment.



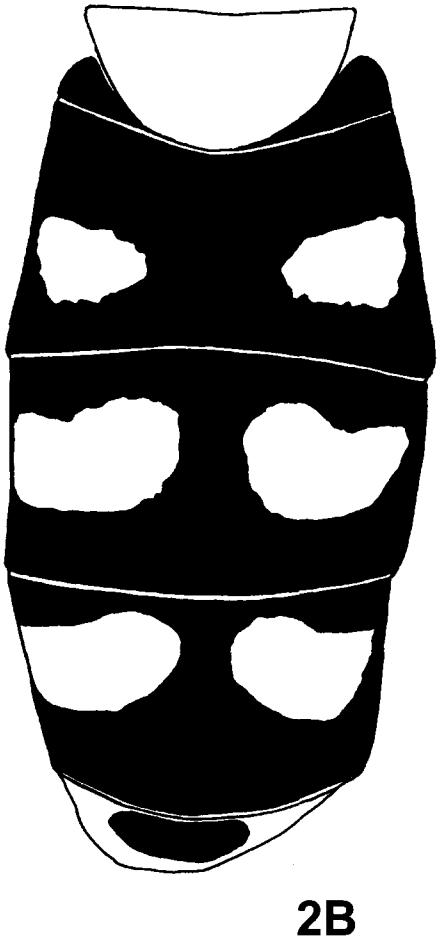


Figure 2. *Eupeodes biciki* spec. nov. A: right fore femur; B: abdomen.

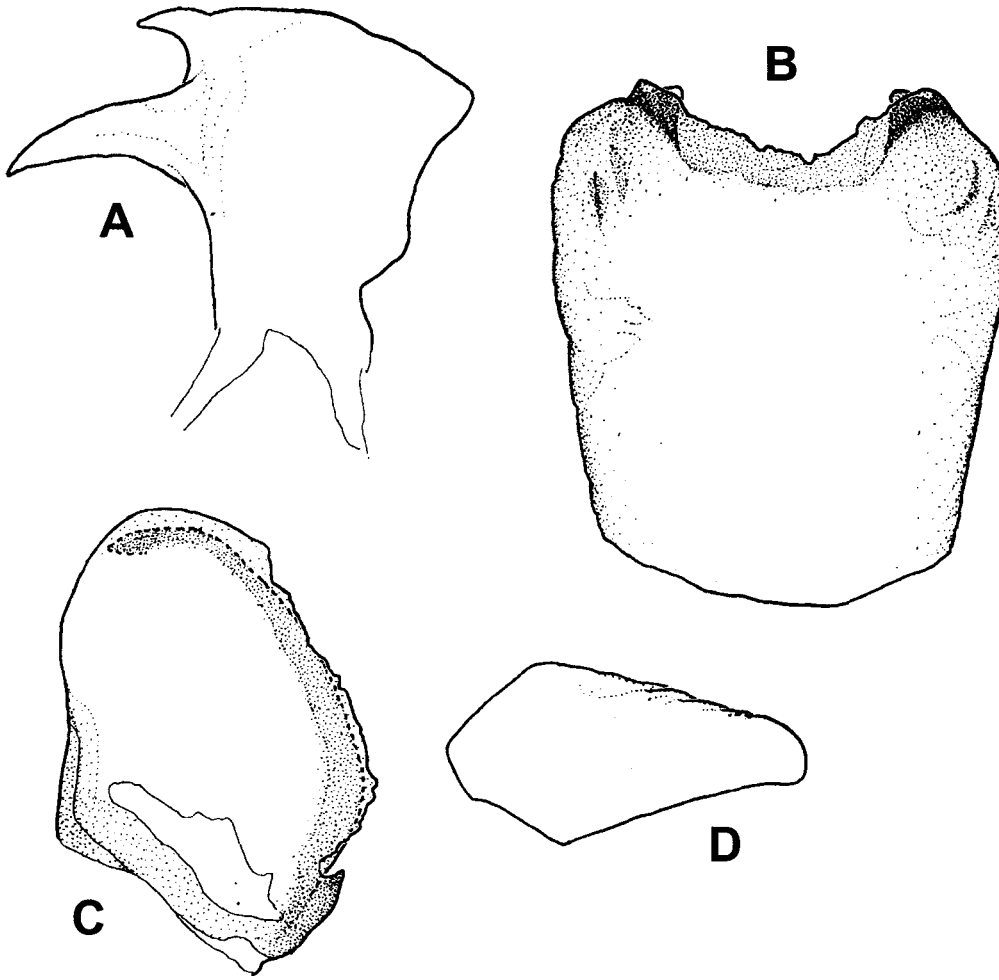


Figure 3. *Eupeodes biciki* spec. nov., terminalia. A: aedeagus; B: hypandrium; C: paramere; D: surstylus.

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Two introduced species of spiders (Araneae) new to Norway and the first record of *Uloborus plumipes* Lucas (Uloboridae) from the Faroes

Kjetil Aakra & Kjell Magne Olsen

Aakra, K & Olsen, K. M. 2003. Two introduced species of spiders (Araneae) new to Norway and the first record of *Uloborus plumipes* Lucas (Uloboridae) from the Faroes. Norw. J. Entomol. 48, 104.

The spiders *Ostearius melanopygius* (O.P.-Cambridge, 1879) (Linyphiidae) and *Uloborus plumipes* Lucas, 1846 (Uloboridae) are reported for the first time from Norway and the latter for the first time from the Faroes islands. Both are human introductions, *O. melanopygius* has been found in two sites near Oslo while *U. plumipes* has been reported from florist shops in Oslo, Akerhus, Aust-Agder and Hordaland as well as Torshavn in the Faroes islands.

Key Words: *Ostearius melanopygius, Uloborus plumipes,* Norway, the Faroes.

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Introduced species of spiders in Norway have received comparatively little attention. The second author has recently discovered two such species which are here reported for the first time from Norway.

Ostearius melanopygius (O.P.-Cambridge, 1879) is a well-known cosmopolitan species. The Norwegian finds are from **BØ** Hurum: Tofte factory (29 Sept. 2001) and **Ø** Fredrikstad: Øra (17 Sept. 2001). Both places are heavily influenced by human activities, and an anthropogenic mode of dispersal is highly likely. In Sweden this species is known from Skåne and Upland (L. Jonsson pers. comm.) while it has not been found in Finland (Palmgren 1977).

Uloborus plumipes Lucas,1846 has been found in a comparatively large number of sites. Known localities are: **AAI** Evje & Hornes: Evje centre (EIS 5) (14 April 2001); **AAY**: Arendal: Stoa (EIS 6) (7 April 1998), Krøgenes (EIS 6 (21 July 2001); Grimstad: Berge (EIS 6) (9 July 1999); **AK** Oslo: Veitvetsenteret (EIS 28) (1 June 1999), Alna (EIS 28) (17 April 1999), Linderudsenteret (EIS 28) (22 Aug. 2000 & 3 February 2001), Ullevål (EIS 28) (21 Jan. 2001), Økern (EIS 28) (3 Feb. 2001), Storosenteret (EIS 28) (17 April 2001), Oslo S (EIS 28) (10 May 2001), Aker sykehus (EIS 28) (1 Feb. 2002), IKEA Furuset (EIS28) (10 March 2003); Skedsmo: Strømmen (EIS 29) (24 July 1999), Hellerudsletta (EIS 28) (22 April 2001); Bærum: Sandvika (EIS 28) (1 Oct. 2000); Lørenskog: Lørenskog Storsenter (EIS 28) (22 Aug. 2000); Aurskog-Høland: Bjørkelangen (EIS 29) (2 Nov. 2001); Nes: Oasen Vormsund (EIS 37) (23 Sept. 2002). **HOI** Etne: Skånevik (EIS 23) (19 July 1999), Jondal: Jondal (EIS 31) (17 July 1999).

All finds are from human habitations and consist of both females and males (25 specimens collected, large numbers observed in total). In several cases eggsacs were seen. In suitable habitats (i.e. large greenhouses and florist shops) the species is probably able to reproduce and thrive. *U. plumipes* is currently an expansive species (Jonsson 1998) and it is expected to increase its range in Norway in the near future. In Sweden the species is known north to Uppland (Jonsson 1998). The species has not been recorded from Finland (Palmgren 1977).

In addition to the Norwegian records, the second author has one previously unpublished record from the Faroe Islands (Blomuhandilin Fipan, Torshavn, 05 August 2000).

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First record of *Dendrocerus bifoveatus* (Kieffer, 1907) (Hymenoptera: Ceraphronoidea) from Svalbard

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Hodkinson, I.D., Buhl, P.N., Coulson, S.J. & Webb, N.R. 2003. First record of *Dendrocerus bifoveatus* (Kieffer, 1907) (Hymenoptera: Ceraphronoidea) from Svalbard. Norw. J. Entomol. 50, 105-106.

The ceraphronid parasitoid *Dendrocerus bifoveatus* (Kieffer, 1907) (Megaspilidae) is reported for the first time from Svalbard. This represents the first Norwegian record for *D. bifoveatus*.

Key words: Spitsbergen, Arctic, water trap, *Dendrocerus bifoveatus*, aphid, *Acyrthosiphon svalbardicum*, *Alloxysta*.

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INTRODUCTION AND RECORDS

During a study of invertebrate colonisation of proglacial areas adjacent to Ny-Ålesund, Kongsfjord, W. Spitsbergen during 2000, a species of Megaspilidae, *Dendrocerus bifoveatus* (Kieffer 1907), was commonly found in water traps at several sites, including the islands of Storholmen, Midtholmen, and Midtre Lovénbre site 7, as described in Hodkinson et al. (2003) and Coulson et al. (2003). This represents a new record for Svalbard and Norway. *D. bifoveatus* was invariably associated with the aphid *Acyrthosiphon svalbardicum* and a cynipid parasitoid (*Alloxysta* species) on sites with relatively mature vegetation. *A. svalbardicum* itself has a restricted distribution within the broader range of its host plant *Dryas octopetala* and occurs only at well-established marginally warmer sites on Kongsfjord (Strathdee & Bale 1995).

DISCUSSION

Dendrocerus species are known hyperparasitoids of aphids, including several *Acyrthosiphon* species, and have previously been found in association with *Alloxysta* species (Stary 1977, Ferguson 1980, Walker & Cameron 1981, Volkl et al., 1995, Chow 2000, Senoo et al. 2002). *Dendrocerus bifoveatus* is formerly known from Iceland, Greenland, Sweden, France, and Russia (Dessart 1972, Kozlov 1978). It has been reared from an *Aphis* sp. on creeping thistle (*Cirsium arvense*).

SPECIES DIAGNOSIS

Female antennal segments 2-4 of almost equal length, preapical antennal segments almost twice as long as wide; flagellar segments of male cylindrical, 2.3-3.3 x as long as wide; pterostigma 2.0-2.2 x as long as wide. Mesopleuron smooth.

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Homoneura consobrina (Zetterstedt, 1847) and *Lauxania albomaculata* Strobl, 1909 (Diptera, Lauxaniidae) in Norway

Lita Greve & Bernhard Merz

Greve, L. & Merz, B. 2003. *Homoneura consobrina* (Zetterstedt, 1847) and *Lauxania albomaculata* (Diptera, Lauxaniidae) in Norway. Norw. J. Entomol. 50, 107-108.

Homoneura consobrina (Zetterstedt, 1847) is recorded as a new species to Norway from Hovedøya, Oslo, Akershus (AK) and Porsgrunn, Porsgrunn, outer Telemark (TEY), both South Norway. *Lauxania albomaculata* Strobl, 1909 is recorded new from Fennoscandia and Denmark from Aamodtdammen, Lørenskog (AK).

Key words: *Homoneura consobrina*, *Lauxania albomaculata*, Diptera, Lauxaniidae, Fennoscandia and Denmark.

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INTRODUCTION

The Diptera family Lauxaniidae includes two subfamilies in NW Europe (Papp & Shatalkin 1998), the Homoneurinae and the Lauxaniinae. In the subfamily Homoneurinae the small, thick, black setulae along the costa are extending to vein R4+5, while they stop well before vein R4+5 in the Lauxaniidae. The Homoneurinae are poorly represented in NW Europe with only one species, *Homoneura tenera* (Loew, 1846) hitherto reported from Norway (Greve 2000). Three species of the genus *Homoneura* are recorded from Denmark (Merz et al. 2001), four from Finland (Hackman 1980) and three from Sweden (H. Andersson pers.comm.).

On the other hand, the Lauxaniinae are quite diverse in Scandinavia. So far, 37 species of the subfamily are recorded from Norway (Greve 2000, 2002a, b), 45 species from Denmark (Merz et al. 2001) and 38 species from Finland (Hackman 1980), although this list needs to be updated. No checklist from Sweden is available.

Two new species for Norway of Lauxaniidae could be identified while studying several samples of material from various localities in Southern Norway. They are both rarely collected, and the present paper allows to get a better idea of their distribution. The material is deposited in the Zoological Museum, University of Bergen.

Subfamily Homoneurinae

Homoneura consobrina (Zetterstedt, 1847)

AK Oslo: Hovedøya (EIS 28), 18 July 1989, 1 ♂, leg. A. Fjeldså. **TEY** Porsgrunn: Porsgrunn (EIS 18), 9 July 1986, 1 ♂, leg. A. Fjeldså.

H. consobrina, described from specimens collected in Southern Sweden, is widely distributed in Europe from Scandinavia south to Italy. It is, however, fairly rare Merz (2002). *H. consobrina* is closely related to *H. thalhammeri* Papp, 1978, and a revision of the *H. consobrina* species group is in progress (Merz, pers. comm.).

Subfamily Lauxaniinae

Lauxania albomaculata Strobl, 1909

AK Lørenskog: Aamodtdammen (EIS 29), Collision trap, Late May - 21 June 1991, 1 ♀, leg. B. Økland.

The locality is an old, natural spruce *(Picea abies* L.) forest with moderate densities of decaying wood. *L. albomaculata* is a small, dark fly, and the first flagellomere is not lengthened. The halters are black, the legs are entirely black, and the parafacials dusted with silver between the antennal bases and the epistomal margin.

L. albomaculata is a rare species which in Europe is recorded only from Austria, Switzerland and the Czech Republic. It is further known from the East Palaearctic, more precisely from Sakhalin and Primorskiy Kray (Shatalkin 1995). The present record is the first for Fennoscandia and Denmark. *L. albomaculata* was earlier placed in *Calliopum* (Papp 1984), but Shatalkin (2000) proposed the new subgenus *Czernushka* in *Lauxania* for this species based on its white, short, plumose arista. Further studies, however, are needed to prove whether this new combination is justified.

Acknowledgements. We wish to express our sincerest thanks to Dr. Bjørn Økland, SKOGFORSK, Ås who put material from the programme «Forest ecology and multiple use» at our disposal.

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Checklist of Norwegian spiders (Arachnida: Araneae), including Svalbard and Jan Mayen

Kjetil Aakra & Erling Hauge

Aakra, K. & Hauge, E. 2003. Checklist of Norwegian spiders (Arachnida: Araneae), including Svalbard and Jan Mayen. Norw. J. Entomol. 50, 109–129.

A new checklist of Norwegian spiders, including the Svalbard archipelago and the island of Jan Mayen, is presented along with taxonomic amendments and updates to the previous checklist. A total of 562 species are currently known from the Norwegian Mainland, 17 from Svalbard and five from Jan Mayen.

Keywords: Araneae, Checklist, Norway.

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INTRODUCTION

Since the publication of the last Norwegian checklist (Hauge 1989), there has been tremendous changes in the systematics and taxonomy of spiders. Also, many new species of spiders have been reported from Norway since then. A preliminary updated checklist with distribution maps has been available on the Internet (Aakra & Hauge 2002) and a new and updated checklist based upon the net presentation is given below. Separate checklists of spiders from the Svalbard archipelago and the remote Mid-Atlantic island of Jan Mayen are also included.

In addition to the checklists a bibliography of literature of Norwegian spiders is given, again separately for the Norwegian Mainland and the Svalbard archipelago/Jan Mayen. These bibliographies contain all known papers where records of species from the respective regions are provided.

METHODS

The present list follow Platnick (2003) in regard to taxonomy and nomenclature, with one noteable exception. We agree with Saaristo (1973) and Saaristo & Koponen (1998) in that *Meioneta* Hull, 1920 is a junior synonym of *Agyneta* Hull, 1911. Although this has been accepted by several authors the former genus continues to be used in the aforementioned catalogue. Accepting the arguments of Saaristo (1973) and Roberts (1987), all members of «*Meioneta*» are here listed under *Agyneta*.

Several other taxonomic changes have been incorporated into this new checklist compared to Hauge (1989). The most important are,

- *Meta* and *Metellina* transferred to the Tetragnathidae (Metidae not recognised).
- *Zygiella* transferred to the Araneidae (Piel & Nutt 1997, Scharff & Coddington 1997).
- *Lepthyphantes* split into several new genera (Saaristo & Tanasevitch 1996, 1999).
- *Argyroneta aquatica* transferred to the Cybaeidae (Grothendieck & Kraus 1994, also see Platnick 2003).
- *Cheiracanthium* spp. transferred to the Miturgidae (Ramírez et al. 1997).
- *Cicurina cicur* (Fabricius, 1793) and *Masti-*

gusa arietina (Thorell, 1871) transferred from the Agelenidae to the Dictynidae (see Lethinen 1967 and Platnick 2003).

- *Cryphoeca silvicola* transferred from the Agelenidae to the Hahniidae (see Platnick 2003).
- The family name Eusparassidae (and Heteropodidae) has been changed to Sparassidae (Jäger 1999).

The first author has recently revised some of the numerous linyphiid species described by Embrik Strand (see Aakra 2002) that were included in the previous checklist (Hauge 1989). The following taxonomic changes have been made,

- *Ceratinella oculatissima* Strand, 1901 = *C. wideri* (Thorell, 1871) (first and only record of this species in Norway)
- *Cnephalocotes dentiger* Strand, 1902 = *Silometopus reussi* (Thoprell, 1871)
- *Cnephalocotes opthalmicus* Strand, 1901 = *Silometopus ambiguus* (O.P.-Cambridge, 1905) (older name suppressed for lack of usage)
- *Pseudogonatium fuscomarginatum* Strand, 1901 = *Zornella cultrigera* (L. Koch. 1879).

Other synonyms now included in the list are,

Araneidae

- *Araneus sinister* (Thorell, 1873) = *A. saevus* (L. Koch, 1872) (see Tullgren, 1952).

Gnaphosidae

- *Gnaphosa intermedia* Holm, 1939 = *G. sticta* Kulczyn'ski, 1908 (Ovtsharenko & Marusik 1988).
- *Zelotes serotinus* (L. Koch, 1866) = *Z. longipes* (L. Koch, 1866) (see Tullgren 1946).

Linyphiidae

- *Centromerus granulosus* (L. Koch, 1879) = *Macrargus multesimus* (O. P.-Cambridge, 1875) (see Holm, 1945).
- *Certainopsis pectinata* (Tullgren, 1955) = *Troxochrota scabra* Kulczynski, 1894 (see Lethinen et al. 1979).
- *Diplocentria replicata* Holm, 1950 = *Wabasso quaestio* (Chamberlin, 1948) (see Millidge 1984).
- *Diplostyla colletti* (Strand, 1899) = *Kaestneria pullata* (O. P.-Cambridge, 1863) (see Eskov & Marusik 1994).
- *Lepthyphantes zebrinus (Menge, 1866)* = *Improphantes decolor* (Westring, 1861) (see Kronestedt 1975).
- *Meioneta beata* (O. P-Cambridge, 1906) = *Agyneta affinis* (Kulczynski, 1898) (see Wunderlich 1973).
- *Oedothorax recurvus* (Strand, 1901) = *Zornella cultrigera* (L. Koch, 1879) (see Holm, 1944).
- *Silometopus laesus* (L. Koch, 1879) = *S. reussi* (Thorell, 1871) (see Denis 1949).

Lycosidae

- *Pirata piccolo* Dahl, 1908 = *P. insularis* Emerton, 1885 (see Hackman 1954).

Thomisidae

- *Xysticus augur* Strand, 1900 = *X. cristatus* (Clerck, 1757) (Tambs-Lyche 1942).
- *Xysticus austerus* L. Koch, 1879 = *X. obscurus* Collett, 1877 (Holm 1973).
- *Xysticus norvegicus* Strand, 1900 = *X. bifasciatus* C. L. Koch, 1837 (see Tambs-Lyche 1942).
- *Xysticus sexangulatus* Strand, 1900 = *X. cristatus* (Clerck, 1757) (Tambs-Lyche 1942).

Salticidae

- *Attulus cinereus* (Westring, 1861) = *Sitticus distinguendus* (Simon, 1868) (see Platnick 2003)
- *Ballus depressus* (Walckenaer, 1802) = *Ballus chalybeius* (Walckenaer, 1802) (see Platnick 2003).

Strand (1900, 1904) described a comparatively large number of *Gnaphosa* spp. (*G. porrecta, G. pseudolapponica, G. limbata, G. nordlandica* and

G. norvegica) that were also included in the previous checklist. Preliminary examination of the types of these by the first author have revealed that they all belong to common and widespread species, or in the case of *G. limbata* (the type of which is lost) must be considered a nomen dubium (Aakra in prep.). They are therefore omitted from the present list. Formal synonymization will be provided in a forthcomming paper.

The Norwegian record of *Dysdera crocota* Cl. L. kloch, 1835 (Dysderidae) mentioned by Bristowe (1939) is highly unlikely and the species has been omitted from the checklist.

The species *Theridion melanurum* Hahn, 1831 has also been removed from the list. Although specimen(s) could not be located in Norwegian collections it is highly likely that this species has been confused with the similar *T. mystaceum* L. Koch, 1870 which has been found in Norway (see Aakra 2000).

The lycosid *Pardosa arenicola* (O.P.-Cambridge, 1875) has been removed from the current checklist. This name probably refers to the subspecies *P. agrestis purbeckensis* F. O. P.-Cambridge, 1895, the taxonomic status of which is rather uncertain. It probably warrants species status (T. Blick pers. comm.). Specimens resembling *P. a. purbeckensis* has been found in both the Oslojord area and in the vicinity of Trondheim (Aakra unpub. data) but the status of this taxon will have to await further study. For the time being only the subspecies is listed from Norway.

Also omitted is *Pardosa thorelli* (Collett, 1876), even if a specimen has not been found and examined. Given the paucity of material since the original description we find it best to treat this species as a nomen dubium until the type is located. However, surviving original drawings of the epigyne of the Holotype indicates that *P. thorelli* belongs to a species of *Acantholycosa*, as also mentioned by Tambs-Lyche (1940) and Holm (1950). A formal synonymization will be presented in a later paper.

Kronestedt (1990) split the species *Alopecosa aculeata* (Clerck 1757) into two distinct species, i.e. the parent species *A. aculeata* and the long overlooked *A. taeniata* (C. L. Koch, 1835). The latter was reported from Norway by Kronestedt (1990) and has since been found in other Norwegian material (Hauge unpub. data).

Diplocephalus semiglobosus (Westring, 1861) is a junior synonym (T. Kronestedt pers. comm.) and has been deleted from the present list.

The salticid *Neon reticulatus* (Blackwall, 1853) was inadevertendly omitted from the last checklist.

The latest addition to the list is by Aakra & Olsen (2003) which reported *Ostearius melanopygius* (O.P.-Cambridge, 1879) (Linyphiidae) and *Uloborus plumipes* Lucas, 1846 (Uloboridae).

Other details regarding nomenclatorial changes (transfers to other genera, etc.) compared to Hauge (1989) are given in the checklist where relevant. All families and species are presented in alphabetical order. New species discovered since the previous checklist are marked with *.

The total number and number of species from each family recorded from Norway is shown in table 1.

Table 1. Total number of species and number of species in each family.

Family	No. of species	Family	No. of species	Family	No. of species	Family	No. of species
Agelenidae	4	Hahniidae	7	Oxyopidae	1	Theridiidae	37
Amaurobiidae	3	Linyphiidae	248	Philodromidae	16	Thomisidae	20
Anyphaenidae	1	Liocranidae	10	Pholcidae	2	Titanoecidae	1
Araneidae	33	Lycosidae	50	Pisauridae	2	Uloboridae	2
Clubionidae	18	Mimetidae	1	Salticidae	30	Zoridae	2
Cybaeidae	1	Miturgidae	3	Segestriidae	1	**Total species:**	**562**
Dictynidae	8	Nesticidae	1	Sparassidae	1		
Gnaphosidae	45	Oonopidae	1	Tetragnathidae	13		

CHECKLIST-NORWEGIAN MAINLAND

Agelenidae

Agelena labyrinthica (Clerck, 1757)

Tegenaria atrica C. L. Koch, 1843

T. domestica (Clerck, 1757)

Textrix denticulata (Olivier, 1789)

Amaurobiidae

Amaurobius fenestralis (Stroem, 1768)

A. similis (Blackwall, 1861)

Arctobius agelenoides Emerton, 1919*

Anyphaenidae

Anyphaena accentuata (Walckenaer, 1802)

Araneidae

Aculepeira ceropegia (Walckenaer, 1802)

Agelenatea redii (Scopoli, 1763)

Araneus alsine (Walckenaer, 1802)

A. angulatus Clerck, 1757

A. diadematus Clerck, 1757

A. marmoreus Clerck, 1757

A. nordmanni (Thorell, 1870)

A. quadratus Clerck, 1757

A. saevus (L. Koch, 1872)

A. sturmi (Hahn, 1833)-Formerly *Atea s.* (see Levi 1991)

Araniella alpica (L. Koch, 1869)

A. cucurbitina (Clerck, 1757)

A. displicata (Hentz, 1847)

A. opisthographa (Kulczynski, 1905)

Cercidia prominens (Westring, 1851)

Cyclosa conica (Pallas, 1772)

Gibbaranea bituberculata (Walckenaer, 1802)

G. omoeda (Thorell, 1870)

Hypsosinga albovittata (Westring, 1851)

H. pygmaea (Sundevall, 1831)

H. sanguinea (C. L. Koch, 1844)

Larinioides cornutus (Clerck, 1757)

L. patagiatus (Clerck 1757)

L. sclopetarius (Clerk, 1757)

Mangora acalypha (Walckenaer 1802)

Neoscona adianta (Walckenaer, 1802)

Nuctenea silvicultrix (C. L. Koch, 1844)-Formerly *Araneus s.*

N. umbratica (Clerck, 1757)

Singa hamata (Clerck, 1757)

S. nitidula C. L. Koch, 1844*

Zygiella atrica (C. L. Koch, 1845)

Z. stroemi (Thorell, 1870)

Z. x-notata (Clerck, 1757)

Clubionidae

Clubiona brevipes Blackwall, 1841

C. caerulescens L. Koch, 1867

C. comta C. L. Koch, 1839

C. diversa O. P.-Cambridge, 1862

C. frisia Wunderlich & Schuett, 1995*-Norwegian specimens previoiusly reported as *C. similis* L. Koch, 1867 belong to this species (Aakra unpub. data, also see Wunderlich & Schuett 1995).

C. frutetorum L. Koch, 1866

C. germanica Thorell, 1871

C. kulczynskii Lessert, 1905

C. lutescens Westring, 1851

C. neglecta O. P.-Cambridge, 1862

C. norvegica Strand, 1900

C. pallidula (Clerck, 1757)

C. phragmitis C. L. Koch, 1843

C. reclusa O. P.-Cambridge, 1863

C. stagnatilis Kulczynski, 1897

C. subsultans Thorell, 1875

C. terrestris Westring, 1851

C. trivialis L. Koch, 1843

Cybaeidae

Argyroneta aquatica (Clerck, 1757)

Dictynidae

Archaeodictyna consecuta (O. P.-Cambridge, 1872)-Formerly *Dictyna c.* (see Lethtinen 1967).

Argenna subnigra (O. P.-Cambridge, 1861)
Cicurina cicur (Fabricius, 1793)
Dictyna arundinacea (Linnaeus, 1758)
D. latens (Fabricius, 1775)
D. pusilla Thorell, 1856
D. uncinata Thorell, 1856
Mastigusa arietina (Thorell, 1871)

Gnaphosidae

Callilepis nocturna (Linnaeus, 1758)
Drassodes cupreus (Blackwall, 1834)
D. lapidosus (Walckenaer, 1802)
D. pubescens (Thorell, 1856)
D. villosus (Thorell, 1856)
Drassyllus lutetianus (L. Koch, 1866)
D. praeficus (L. Koch, 1866)
D. pumilus (C. L. Koch, 1839)
D. pusillus (C. L. Koch, 1833)
Echemus angustifrons (Westring, 1861)*
Gnaphosa bicolor (Hahn, 1833)
G. lapponum (L. Koch, 1866)
G. leporina (L. Koch, 1866)
G. lucifuga (Walckenaer, 1802)
G. microps Holm, 1939
G. montana (L. Koch, 1866)
G. muscorum (L. Koch, 1866)
G. orites Chamberlin, 1922
G. sticta Holm, 1939
G. intermedia Holm, 1939
Haplodrassus cognatus (Westring, 1861)
H. minor (O. P.-Cambridge, 1879)
H. moderatus (Kulczynski, 1897)
H. signifer (C. L. Koch, 1839)
H. soerenseni (Strand, 1900)
H. sylvestris (Blackwall, 1833)
H. umbratilis (L. Koch, 1866)
Micaria aenea Thorell, 1871
M. alpina L. Koch, 1872
M. formicaria (Sundevall, 1832)
M. fulgens (Walckenaer, 1802)
M. nivosa L. Koch, 1866
M. pulicaria (Sundevall, 1832)
M. silesiaca L. Koch, 1875
M. subopaca Westring, 1861
Poecilochroa variana (C. L. Koch, 1839)
Scotophaeus blackwalli (Thorell, 1873)
S. quadripunctatus (Linnaeus, 1758)
Zelotes clivicola (L. Koch, 1870)
Z. electus (C. L. Koch, 1839)
Z. latreillei (Simon, 1878)
Z. longipes (L. Koch, 1866)
Z. petrensis (C. L. Koch, 1839)
Z. puritanus Chamberlin, 1922*
Z. subterraneus (C. L. Koch, 1833)

Hahniidae

Antistea elegans (Blackwall, 1841)
Cryphoeca silvicola (C. L. Koch, 1834)
Hahnia helveola Simon, 1875
H. montana (Blackwall, 1841)
H. nava (Blackwall, 1841)
H. ononidum Simon, 1875
H. pusilla C. L. Koch, 1841

Linyphiidae

Abacoproeces saltuum (L. Koch, 1872)
Abiskoa abiskoensis (Holm, 1945)*
Agnyphantes expunctus (O.P.-Cambridge, 1875)- Formerly *Lepthyphantes e.* (see Saaristo & Tanasevitch 1996 and Platnick 2003).
Agyneta affinis (Kulczynski, 1898)
A. cauta (O. P.-Cambridge, 1902)
A. conigera (O. P.-Cambridge, 1863)
A. decora (O. P.-Cambridge, 1870)
A. fuscipalpus (C.L.Koch, 1836)
A. gulosa (L.Koch, 1869)
A. innotabilis (O.P.-Cambridge, 1863)
A. mossica (Schikora 1993)*
A. nigripes (Simon, 1884)
A. olivacea (Emerton, 1882)
A. ramosa Jackson, 1912

A. rurestris (C.L.Koch, 1836)

A. saxatilis (Blackwall, 1844)

A. similis (Kulczynski, 1926)

A. subtilis (O. P-Cambridge, 1863)

A. suecica Holm, 1950-Probably a synonym of *A. arietans* (O.P.-Cambridge, 1872) (Palmgren 1975).

Allomengea scopigera (Grube, 1859)

A. vidua (L.Koch, 1879)*

Anguliphantes angulipalpis (Westring, 1851)-Formerly *Lepthyphantes a.* (Saaristo & Tanasevitch 1996).

Araeoncus crassiceps (Westring, 1861)

Asthenargus paganus (Simon, 1884)

Baryphyma trifrons (O. P.-Cambridge, 1863)-Transferred to *Minyrioloides by* Tanasevitch (1990), but not accepted by Platnick (2003).

Bathyphantes approximatus (O.P.-Cambridge, 1871)

B. gracilis (Blackwall, 1841)

B. nigrinus (Westring, 1851)

B. parvulus (Westring, 1851)

B. setiger F.O. P-Cambridge, 1894

B. similis Kulczynski, 1894-Formerly *B. norvegicus* Strand, 1902 (Holm 1987, contra Holm 1944 (?), see Hauge 1989)

Bolephthyphantes index (Thorell, 1856)-Formerly *Bolyphantes i.* (see Saaristo & Tanasevitch 1996, 2000 and Platnick 2003)

Bolyphantes alticeps (Sundevall, 1833)

B. luteolus (Blackwall, 1833)

Caviphantes saxetorum (Hull, 1916)*

Centromerita bicolor (Blackwall, 1833)-Transfer to *Centromerus* (Saaristo & Tanasevitch 1996) not accepted by Platnick (2003).

C. concinna (Thorell, 1875)-Transfer to *Centromerus* (Saaristo & Tanasevitch 1996) not accepted by Platnick (2003).

Centromerus brevivulvatus Dahl, 1912-Formerly C. *aequalis* (C. L. Koch, 1841)(see Platnick 2003)

C. arcanus (O.P.-Cambridge, 1873)

C. dilutus (O. P-Cambridge, 1875)

C. incillium (L.Koch, 1881)

C. pabulator (O. P-Cambridge, 1875)

C. prudens (O. P-Cambridge, 1873)

C. sylvaticus (Blackwall, 1841)

Ceratinella brevipes (Westring, 1851)

C. brevis (Wider, 1834)

C. scabrosa (O. P-Cambridge, 1871)

Ceratinella wideri (Thorell, 1871)*-Formerly *C. oculatissima* (Strand, 1901) (see Palmgren 1976 and Aakra 2002).

Cnephalocotes obscurus (Blackwall, 1834)

Collinsia holmgreni (Thorell, 1871)

C. inerrans (L.Koch, 1879)-Formerly *Milleriana i.* (O.P.-Cambridge, 1885) (see Marusik et al. 1993 and Platnick 2003).

C. spetsbergensis (Thorell, 1871)

Decipiphantes decipiens (L.Koch, 1879)-Formerly *Lepthytphantes d.* (see Saaristo & Tanasevtich 1996).

Dicymbium nigrum (Blackwall 1834)-Specimens have not been checked for *D. n. brevisetosum* Locket, 1962.

D. tibiale (Blackwall, 1836)

Diplocentria bidentata (Emerton, 1882)

D. rectangulata (Emerton, 1915)-Formerly *Microcentria pusilla* (Schenkel, 1925)

Diplocephalus cristatus (Blackwall, 1833)

D. latifrons (O.P.-Cambridge, 1863)

D. permixtus (O.P.-Cambridge, 1871)

D. picinus (Blackwall, 1841)

Diplostyla concolor (Wider, 1834)

Dismodicus bifrons (Blackwall, 1841)

D. elevatus (C.L.Koch, 1838)

Drapetisca socialis (Sundevall, 1833)

Drepanotylus uncatus (O.P.-Cambridge, 1873)

Entelecara acuminata (Wider, 1834)

E. congenera (O.P.-Cambridge, 1879)

E. erythropus (Westring, 1851)

E. flavipes (Blackwall, 1834)*

E. media Kulczynski, 1887

Erigone arctica (White, 1852)

E. atra Blackwall, 1833

E. dentigera O.P.-Cambridge, 1874-Formerly *E. capra* Simon, 1884 (see Eskov 1994).

E. dentipalpis (Wider, 1834)

E. longipalpis (Sundevall, 1830)

E. promiscua (O.P.-Cambridge, 1872)

E. psychrophila Thorell, 1872

E. tirolensis L.Koch, 1872

Erigonella hiemalis (Blackwall, 1841)

E. ignobilis (O.P.-Cambridge, 1871)

Evansia merens O.P.-Cambridge, 1900

Floronia bucculenta (Clerck, 1757)

Gnathonarium dentatum (Wider, 1834)

Gonatium paradoxum (L.Koch, 1869)

G. rubellum (Blackwall, 1841)

G. rubens (Blackwall, 1833)

Gongylidiellum latebricola (O.P.-Cambridge, 1871)

G. murcidum Simon, 1884

G. vivum (O.P.-Cambridge, 1875)

Gongylidium rufipes (Linnaeus, 1758)

Halorates reprobus (O.P.-Cambridge, 1879)

Helophora insignis (Blackwall, 1841)

Hilaira excisa (O.P.-Cambridge, 1871)

H. frigida (Thorell, 1872)

H. herniosa (Thorell, 1875)

H. nubigena Hull, 1911

H. pervicax Hull, 1908

Hypomma bituberculatum (Wider, 1834)

H. cornutum (Blackwall, 1833)

Hypselistes jacksoni (O.P.-Cambridge, 1902)

Improphantes complicatus (Emerton, 1882)-Formerly *Lepthyphantes c.* (see Saaristo & Tanasevitch 1996).

I. decolor (Westring, 1861)-Formerly *Lepthyphantes d.* (Saaristo & Tanasevitch 1996).

Incestophantes crucifer (Menge, 1866)-Transferred from *Bolyphantes* to *Lepthyphantes* by Thaler et al. (1994), tranferred to *Incetophantes* by Saaristo & Tanasevitch (2000).

I. kochiellus (Strand, 1900)-Formerly *Lepthyphantes k.* (see Saaristo & Tanasevitch 1996).

Jacksonella falconeri (Jackson, 1908)

Kaestneria dorsalis (Wider, 1834)

K. pullata (O.P.-Cambridge, 1863)

Labulla thoracica (Wider, 1834)

Lasiargus hirsutus (Menge, 1869)

Lepthyphantes antroniensis Schenkel, 1933

L. ericaeus (Blackwall, 1853)

L. leprosus (Ohlert, 1867)

L. minutus (Blackwall, 1833)

L. pallidus (O.P.-Cambridge, 1871)

Leptorhoptrum robustum (Westring, 1851)

Leptothrix hardyi (Blackwall, 1850)

Linyphia hortensis Sundevall, 1830

L. tenuipalpis Simon, 1884*

L triangularis (Clerck, 1757)

Lophomma punctatum (Blackwall, 1841)

Macrargus boreus Holm, 1968

M. carpenteri (O.P.-Cambridge, 1894)

M. multesimus (O.P.-Cambridge, 1875)

M. rufus (Wider, 1834)

Maro lehtineni Saaristo, 1971

M. lepidus Casemir, 1961*

M. minutus O.P.-Cambridge, 1906

M. sublestus Falconer, 1915

Maso sundevalli (Westring, 1851)

Mecynargus borealis (Jackson, 1930)

M. monticola (Holm, 1943)

M. morulus (O.P.-Cambridge, 1873)

M. paetulus (O.P.-Cambridge, 1875)

M. sphagnicola (Holm, 1939)

Megalepthyphantes nebulosus (Sundevall, 1830)-Formerly *Lepthyphantes n.* (Saaristoa & Tanasevitch 1996).

Metopobactrus prominulus (O. P.-Cambridge, 1872)

Micrargus apertus (O. P.-Cambridge, 1871)

M. herbigradus (Blackwall, 1854)

M. subaequalis (Westring, 1851)

Microctenonyx subitaneus (O.P.-Cambridge, 1875)

Microlinyphia pusilla (Sundevall, 1830)

Microneta viaria (Blackwall, 1841)

Minicia marginella (Wider, 1834)

Minyriolus pusillus (Wider, 1834)

Mioxena blanda (Simon, 1884)

Moebelia penicillata (Westring, 1851)

Monocephalus castaneipes (Simon, 1884)

Mughiphantes suffusus (Strand, 1901)-Formerly *Lepthyphantes s.* (Saaristo & Tanasevitch 1999).

M. whymperi (F.O.P.-Cambridge, 1894)-Formerly *Lepthyphantes w.* (Saaristo & Tanasevitch 1996)

Neriene clathrata (Sundevall, 1830)

N. montana (Clerck, 1757)

N. peltata (Wider, 1834)

N. radiata (Walckenaer, 1841)

Notioscopus sarcinatus (O.P.-Cambridge, 1872)

Obscuriphantes obscurus (Blackwall, 1841)-Formerly *Lepthyphantes o.* (Saaristo & Tanasevitch 2000).

Oedothorax agrestis (Blackwall, 1853)

O. apicatus (Blackwall, 1850)

O. fuscus (Blackwall, 1834)

O. gibbosus (Blackwall, 1841)

O. retusus (Westring, 1851)

Oreonetides vaginatus (Thorell, 1872)

Oryphantes angulatus (O.P.-Cambridge, 1881)-Formerly *Lepthyphantes a.*(Saaristo & Tanasevitch 1996)

Ostearius melanopygius (O..-Cambridge, 1879)-Synantropic

Panamomops mengei Simon, 1926

Parapelecopsis nemoralis (Blackwall, 1841)-Formerly *Pelecopsis n.* (Wunderlich 1992).

Pelecopsis elongata (Wider, 1834)

P. mengei (Simon, 1884)

P. parallela (Wider, 1834)

P. radicicola (L.Koch, 1872)

Peponocranium ludicrum (O.P.-Cambridge, 1861)

Pityohyphantes phrygianus (C.L.Koch, 1836)

Pocadicnemis pumila (Blackwall, 1841)

Poeciloneta variegata (Blackwall, 1841)-Formerly *P. globosa* (Wider, 1834).

Porrhomma campbelli F.O.P.-Cambridge, 1894

P. convexum (Westring, 1851)

P. lativelum Tretzel, 1956

P. microphthalmum (O.P.-Cambridge, 1871)*

P. montanum Jackson, 1913

P. oblitum (O. P.-Cxambridge, 1871)

P. pallidum Jackson, 1913

P. pygmaeum (Blackwall, 1834)

Satilatlas britteni (Jackson, 1913)

Saaristoa abnormis (Blackwall, 1841)

S. firma (O.P.-Cambridge, 1905)*

Savignia frontata Blackwall, 1833

Scandichrestus tenuis (Holm, 1943)-Formerly *Typhochrestus t.* (Wunderlich 1995).

Scotinotylus clavatus (Schenkel, 1927)-Probably senior synonym of *S. sacer* (Crosby, 1929) (see Thaler 1970).

S. evansi (O.P.-Cambridge, 1894)

Semljicola angulatus (Holm, 1963)-Formerly *Eboria a.* (see Eskov & Marusik 1994).

S. faustus (O.P.-Cambridge, 1900)-Formerly *Latithorax f.* (see Saaristo & Eskov 1996).

S. latus (Holm, 1939)-Formerly *Latthorax l.* (see Saaristo & Eskov 1996).

S. lapponicus (Holm, 1939)*

Silometopus ambiguus (O.P.-Cambridge, 1905)

S. elegans (O.P.-Cambridge, 1872)

S. incurvatus (O.P.-Cambridge, 1873)

S. reussi (Thorell, 1871)

Sintula corniger (Blackwall, 1856)

Sisicus apertus (Holm, 1939)

Stemonyphantes lineatus (Linnaeus, 1758)

Styloctetor stativus (Simon, 1881)-Formerly

Ceratinopsis s. (see Wunderlich 1970 and Marusik & Tanasevitch 1998).

Syedra gracilis (Menge, 1869)

Tallusia experta (O.P.-Cambridge, 1871)

Tapinocyba insecta (L.Koch, 1869)

T. pallens (O.P.-Cambridge, 1872)

Tapinocyboides pygmaeus (Menge, 1869)

Tapinopa longidens (Wider, 1834)

Taranucnus setosus (O.P.-Cambridge, 1863)

Tenuiphantes alacris (Blackwall, 1853)-Formerly *Lepthyphantes a.* (Saaristo & Tanasevitch 1996).

T. cristatus (Menge, 1866)-Formerly *Lepthyphantes c.* (see Saaristo & Tanasevitch 1996).

T. flavipes (Blackwall, 1854)-Formerly *Lepthyphantes f.* (see Sdaaristo & Tanasevitch 1996).

T. mengei (Kulczynski, 1887)-Formerly *Lepthyphantes m.* (Saaristo & Tanasevitch 1996).

T. nigriventris (L.Koch, 1879)-Formerly *Lepthyphantes n.* (Saaristo & Tanasevitch 1996).

T. tenebricola (Wider, 1834)-Formerly *Lepthyphantes t.* (see Saaristo & Tanasevitch 1996).

T. tenuis (Blackwall, 1852)-Formerly *Lepthyphantes t.* (Saaristo & Tanasevitch 1996).

T. zimmermanni (Bertkau, 1890)-Formerly *Lepthyphantes z.* (Saaristo & Tanasevitch 1996).

Thyreosthenius biovatus (O.P.-Cambridge, 1875)

T. parasiticus (Westring, 1851)

Tiso aestivus (L.Koch, 1872)

T. vagans (Blackwall, 1834)

Tmeticus affinis (Blackwall, 1855)

T. nigriceps (Kulczynski, 1916)

Trichoncus vasconicus Denis, 1944

Troxochrota scabra Kulczynski, 1894

Troxochrus nasutus Schenkel, 1925

T. scabriculus (Westring, 1851)

Typhochrestus digitatus (O.P.-Cambridge, 1872)

T. sylviae Hauge, 1968

Wabasso quaestio (Chamberlin, 1948)

Walckenaeria acuminata Blackwall, 1833

W. antica (Wider, 1834)

W. atrotibialis (O.P.-Cambridge, 1878)

W. capito (Westring, 1861)

W. clavicornis (Emerton, 1882)

W. cucullata (C.L.Koch, 1836)

W. cuspidata (Blackwall, 1833)

W. dysderoides (Wider, 1834)

W. inflexa (Westring, 1861) (?)-Doubtful species (L. J. Jonsson pers. comm.), but accepted by Platnick (2003).

W. karpinskii (O.P.-Cambridge, 1873)

W. kochi (O. P.-Cambridge, 1872)

W. mitrata (Menge, 1868)

W. monoceros (Wider, 1834)

W. nodosa O. P.-Cambridge, 1873

W. nudipalpis (Westring, 1851)

W. obtusa Blackwall, 1836

W. unicornis O. P.-Cambridge, 1861

W. vigilax (Blackwall, 1853)

Zornella cultrigera (L.Koch, 1879)

Liocranidae

Agroeca brunnea *(Blackwall, 1833)*

A. cuprea Menge, 1873*

A. proxima (O. P.-Cambridge, 1871)

Apostenus fuscus Westring, 1851

Liocranum rupicola (Walckenaer, 1830)

Phrurolithus festivus (C. L. Koch, 1835)

P. minimus C. L. Koch, 1839

Scotina celans (Blackwall, 1841)

S. gracilipes (Blackwall, 1859)

S. palliardi (L. Koch, 1881)

Lycosidae

Acantholycosa lignaria (Clerck, 1757)

Acantholycosa norvegica (Thorell, 1872)

Alopecosa aculeata (Clerck, 1757)

A. barbipes (Sundevall, 1833)

A. cuneata (Clerck, 1757)

A. fabrilis (Clerck, 1757)

A. inquilina (Clerck, 1757)

A. pinetorum (Thorell, 1856)

A. pulverulenta (Clerck, 1757)

A. taeniata (C. L. Koch, 1835)*

A. trabalis (Clerck, 1757)

Arctosa alpigena (Doleschall, 1852)-Formerly *Tricca a.* (see Dondale & Redner 1983).

A. cinerea (Fabricius, 1777)

A. leopardus (Sundevall, 1833)

A. lutetiana (Simon, 1876)*

A. perita (Latreille, 1799)

A. stigmosa (Thorell, 1875)*

Hygrolycosa rubrofasciata (Ohlert, 1865)

Pardosa agrestis (O. P.-Cambridge, 1875)

P. agrestis purbeckensis F. O. P.-Cambridge, 1895*-Formerly *P. arenicola* (O. P.-Cambridge, 1875)

P. agricola (Thorell, 1856)

P. amentata (Clerck, 1757)

P. atrata (Thorell, 1873)

P. eiseni (Thorell, 1875)

P. fulvipes (Collett, 1876)

P. hyperborea (Thorell, 1872)

P. lapponica (Thorell, 1872)

P. lasciva L. Koch, 1879*

P. lugubris (Walckenaer, 1802) senso lato-Material has not yet been checked for specimens of *P. alacris* (C. L. Koch, 1833) or *P. saltans* Töpfer-Hofman , 2000 (see Töpfer-Hofman et al. 2000).

P. monticola (Clerck, 1757)

P. nigriceps (Thorell, 1856)-Material has not yet been checked for specimens of *P. maisa* Hippa & Mannila, 1982 (see Hippa & Manilla 1982).

P. paludicola (Clerck, 1757)

P. palustris (Linnaeus, 1758)

P. prativaga (C. L. Koch, 1870)

P. pullata (Clerck, 1757)

P. riparia (C. L. Koch, 1833)

P. schenkeli Lessert, 1904

P. septentrionalis (Westring, 1861)

P. sphagnicola (Dahl, 1908)

P. trailli (O. P.-Cambridge, 1873)

Pirata hygrophilus Thorell, 1872

P. insularis Emerton, 1885

P. piraticus (Clerck, 1757)

P. piscatorius (Clerck, 1757)

P. uliginosus (Thorell, 1856)

Trochosa ruricola (De Geer, 1778)

T. spinipalpis (F. O. P.-Cambridge, 1895)

T. terricola Thorell, 1856.

Xerolycosa miniata (C. L. Koch, 1834).

X. nemoralis (Westring, 1861)

Mimetidae

Ero furcata (Villers, 1789)

Miturgidae

Cheiracanthium erraticum (Walckenaer, 1802)

C. oncognathum Thorell, 1871

C. virescens (Sundevall, 1833)

Nesticidae

Nesticus cellulanus (Clerck, 1757)

Oonopidae

Oonops pulcher Templeton, 1835

Oxyopidae

Oxyopes ramosus (Martini & Goeze, 1879)*-Doubtful record, only reported by Collett (1876), specimen(s) apparently lost.

Philodromidae

Philodromus aureolus (Clerck, 1757)

P. cespitum (Walckenaer, 1802)

P. collinus C. L. Koch, 1835

P. dispar Walckenaer, 1826

P. emarginatus (Schrank, 1803)

P. fuscomarginatus De Geer, 1778

P. histrio (Latreille, 1819)*

P. margaritatus (Clerck, 1757)

P. rufus Walckenaer, 1825

Thanatus arcticus Thorell, 1872
T. arenarius Thorell, 1872
T. atratus Simon, 1875
T. formicinus (Clerck, 1757)
T. striatus C. L. Koch, 1845
Tibellus maritimus (Menge, 1875)
T. oblongus (Walckenaer, 1802)

Pholcidae

Psilochorus simoni (Berland, 1911)

Pisauridae

Dolomedes fimbriatus (Clerck, 1757)
Pisaura mirabilis (Clerck, 1757)

Salticidae

Aelurillus v-insignitus (Clerck, 1757)
Ballus chalybeius (Walckenaer, 1802)
Bianor aurocinctus (Ohlert, 1865)
Dendryphantes hastatus (Clerck, 1757)
D. rudis (Sundevall, 1832)
Euophrys frontalis (Walckenaer, 1802)*
Evarcha arcuata (Clerck, 1757)
E. falcata (Clerck, 1757)
Heliophanus cupreus (Walckenaer, 1802)
H. dampfi Schenkel, 1923
H. dubius C. L. Koch, 1835
H. flavipes (Hahn, 1832)
Marpissa muscosa (Clerck, 1757)
Myrmarachne formicaria (De Geer, 1778)*
Neon reticulatus (Blackwall, 1853)
Pellenes tripuncatus (Walckenaer, 1802)
Phlegra fasciata (Hahn, 1826)
Pseudoeuophrys erratica (Walckenaer, 1826)-Formerly *Euophrys e.* (see Zabka 1997)
Salticus cingulatus (Panzer, 1797)
S. scenicus (Clerck, 1757)
S. zebraneus (C. L. Koch, 1837)
Sitticus distinguendus (Simon, 1868)
S. floricola (C. L. Koch, 1837)
S. inexpectus Logunov & Kronestedt, 1997* -specimens previously reported as *S. rupicola* (C. L. Koch, 1837) probably belong to this species (see Kronestedt & Logunov 1997).
S. pubescens (Fabricus, 1775)
S. saltator (Simon, 1868)-Formerly *Attulus s.* (see Platnick 2003)
S. terebratus (Clerck, 1757)
Talavera aequipes (O. P.-Cambridge, 1871)* -Formerly *Euophrys a.* (see Logunov 1992)
T. petrensis (C. L. Koch, 1837)
T. thorelli (Kulczynski, 1891)*

Segestriidae

Segestria senoculata (Linnaeus, 1758)

Sparassidae

Micrommata virescens (Clerck, 1757)

Tetragnathidae

Meta menardi (Latreille, 1804)
Metellina mengei (Blackwall, 1869)
M. merianae (Scopoli, 1763)
M. segmentata (Clerck, 1757)
Pachygnatha clercki Sundevall, 1823
P. degeeri Sundevall, 1830
P. listeri Sundevall, 1830
Tetragnatha dearmata Thorell, 1873
T. extensa (Linnaeus, 1758)
T. montana Simon, 1874
T. obtusa C. L. Koch, 1837
T. pinicola L. Koch, 1870
T. striata L. Koch, 1862

Theridiidae

Achaearanea lunata (Clerck, 1757)
A. ohlerti Thorell, 1870-Formerly *Theridion o.* (see Heimer & Nentwig 1991).
Achaearanea riparia (Blackwall, 1834)*
A. tepidariorum (C. L. Koch, 1841)-Probably synanthropic
Anelosimus vittatus (C. L. Koch, 1836)

Crustulina guttata (Wider, 1834)
Dipoena inornata (O. P.-Cambridge, 1861)
D. melanogaster (C. L. Koch, 1837)
D. torva (Thorell, 1871)*
Enoplognatha ovata (Clerck, 1757)
E. thoracica (Hahn, 1833)
Episinus angulatus (Blackwall, 1853)
E. truncatus Latreille, 1809
Euryopis flavomaculata (C. L. Koch, 1836)
Lasaeola tristis (Hahn, 1833)-Formerly *Dipoena t.*
Neottiura bimaculata (Linnaeus, 1767)-Formerly *Theridion bimaculatum* (see Platnick 2003)
Paidiscura pallens (Blackwall, 1834)-Formerly *Theridion p.* (see Wunderlich 1987)
Pholcomma gibbum (Westring, 1851)
Robertus arundineti (O. P.-Cambridge, 1871)
R. lividus (Blackwall, 1836)
R. lyrifer Holm, 1939
R. neglectus (O. P.-Cambridge, 1871)
R. scoticus Jackson, 1914
Rugathodes bellicosus (Simon, 1873)-Formerly *Theridion b.* (see Kronestedt 1993).
Simitidion simile (C. L. Koch, 1836)*-Formerly *Theridion s.* (see Wunderlich 1992).
Steatoda albomaculata (De Geer, 1778)
S. bipuncata (Linnaeus, 1758)
S. phalerata (Panzer, 1801)
Theonoe minutissima (O. P.-Cambridge, 1879)
Theridion impressum L. Koch, 1881
T. montanum Emerton, 1882
T. mystaceum L. Koch, 1870*-Previously listed as *T. melanurum* Hahn, 1831 (see Aakra 2000).
T. pictum (Walckenaer, 1802)
T. pinastri L. Koch, 1862*
T. sisyphium (Clerck, 1757)
T. tinctum (Walckenaer, 1802)
T. varians Hahn, 1833

Thomisidae

Coriarachne depressa (C. L. Koch, 1837)
Diaea dorsata (Fabricius, 1777).
Misumena vatia (Clerck, 1757)
Ozyptila arctica Kulczynski, 1908
O. atomaria (Panzer, 1801)
O. praticola (C. L. Koch, 1837)
O. rauda Simon, 1875
O. trux (Blackwall, 1846)
Xysticus albidus Greese, 1909
X. audax (Schrank, 1803)
X. bifasciatus C. L. Koch, 1837
X. cristatus (Clerck, 1757)
X. erraticus (Blackwall, 1834)
X. kochi Thorell, 1872
X. lanio C. L. Koch, 1835
X. lineatus (Westring, 1851)
X. luctuosus (Blakcwall, 1836)
X. obscurus Collett, 1876
X. sabulosus (Hahn, 1832)
X. ulmi (Hahn, 1832)

Titanoecidae

Titanoeca nivalis Simon, 1874

Uloboridae

Hyptiotes paradoxsus (C. L. Koch, 1834)
Uloborus plumipes Lucas, 1846* -Synantropic

Zoridae

Zora nemoralis (Blackwall, 1861)
Z. spinimana (Sundevall, 1833)

CHECKLIST-SVALBARD ARCHIPELAGO

Gnaphosidae

Micaria eltoni (Jackson 1922)

Hahniidae

Hahnia helveola Simon, 1875-Probably synanthropic

Linyphiidae

Agyneta nigripes (Simon, 1884)-Formerly *Meioneta n.* (see Saaristo & Tanasevitch 1996).

Collinsia holmgreni (Thorell, 1871)

C. spetsbergensis (Thorell, 1872)

C. thulensis (Jackon, 1934)

Erigone arctica palaearctica Braendegaard, 1934

E. psychrophila Thorell, 1872

E. tirolensis L.Koch, 1872

Hilaira glacialis (Thorell, 1871)

Improphantes complicatus (Emerton, 1882)-Formerly *Lepthyphantes c.* (Saaristo & Tanasevitch 1996).

Mecynargus borealis (Jackson, 1930)

Mughiphantes sobrius (Thorell, 1872)-Formerly *Lepthyphantes s.* (Saaristo & Tanasevitch 1996).

Oreonetides vaginatus (Thorell, 1872)

Tapinocyba insecta (L.Koch, 1869)-Probably synanthropic

Walckenaeria karpinskii (O.P.-Cambridge, 1873)

Philodromidae

Thanatus formicinus (Clerck, 1757)*-Synanthropic.

CHECKLIST-JAN MAYEN

Linyphiidae

Agyneta nigripes (Simon, 1884)-Formerly *Meioneta n.* (see Saaristo & Tanasevitch 1996).

Collinsia holmgreni (Thorell, 1871)

Erigone tirolensis L.Koch, 1872

Hilaira frigida (Thorell, 1872)

Walckenaeria clavicornis (Emerton, 1882)

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Aspistes berolinensis Meigen, 1818 (Diptera, Scatopsidae) rediscovered in Norway

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Hansen, L.O. 2003. *Aspistes berolinensis* Meigen, 1818 (Diptera, Scatopsidae) rediscovered in Norway. Norw. J. Entomol. 50, 130.

A new record of *Aspistes berolinensis* Meigen, 1818 is reported from Norway. A ♀ was captured in a malaise-trap at Ørekroken on the island Kirkøy (Ø Hvaler), in 2003. This species is previously recorded once in Norway, from HES Elverum: Grundset in 1870. Both records are from sandy areas, which is in accordance with the known biology of the species.

Key words: *Aspistes berolinensis*, Diptera, Scatopsidae, Norway, sandy areas.

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The genus *Aspistes* is a distinctive and easily recognizable genus in the family Scatopsidae. The genus forms the small subfamily Aspistinae together with the genus *Arthria* in the Holarctic (Cook 1981, Haenni 1997). The subfamily is easily recognized by an elevated u-shaped ridge on scutum (illusterated in Cook 1981, p. 315). The generae may be seaparated by the antennal flagomers, i.e. *Aspistes* has six or more, *Arthria* never more than five.

Aspistinae is very poor in species in the Palaearctic, and only represented with one species in *Arthria,* and two in *Aspistes* (Haenni 1997). One species in each genus are present in Norway (Siebke 1877, Haenni & Greve 1995). Several Norwegian records are present of *Arthria analis* Kirby, 1837, but *Aspistes berolinensis* has hitherto only been recorded once in Norway from **HES** Elverum: Grundset (EIS 55), 1♀ 8 August 1870 leg. J.H.S. Siebke (see Siebke 1877, Haenni & Greve 1995). The specimen is deposited in the Zoological Museum, University of Oslo.

A single ♀ was captured in a malaise-trap at **Ø** Hvaler: Kirkøy, Ørekroken (UTM WGS84 32V PL 153 454; EIS 12) 20 June - 16 July 2003, leg. LOH. The trap was situated close to a stream running through an open, sandy, shore area scattered with pines (*Pinus sylvestris*). The specimen is deposited in the Zoological Museum, University of Oslo.

A. berolinensis is widely distributed in Europa and eastwards into European Russia and Ukraina (Krivosheina & Haenni 1986). The species is associated with sandy areas (Haenni & Greve 1995), and both the norwegian records are from sandy areas.

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Contribution to the knowledge of Norwegian Coleoptera

Stefan Olberg & Johan Andersen

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Microlestes minutulus (Goeze, 1777), *Gyrophaena joyioides* Wüsthoff, 1937 and *Isorhipis marmottani* Bonvouloir, 1871 are reported for the first time in Norway. *Bledius crassicollis* Lacordaire, 1835 is replaced by *Bledius occidentalis* Bondroit, 1907. New provincial records are reported for 12 rare species. Some faunistic and autecological aspects are briefly discussed.

Key words: Coleoptera, distribution, Norway.

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INTRODUCTION

This paper presents records of species not previously published from Norway, or new provincial records of other noteworthy, mostly rare and red listed species from the southern and central parts of the country. Two of the species that we report as new to Norway are mentioned in Muona (1995) and Direktoratet for Naturforvaltning (1999), but without specification of provinces or localities and other details. The collected material is deposited at the Department of Ecology/Zoology, University of Tromsø or in the first author's private collection. The nomenclature of beetles follows Lundberg (1995), that of polypores Ryvarden & Gilbertson (1993, 1994) and that of plants Mossberg et al. (1995).

The following abbreviations are used in the text:

FØ: Frode Ødegaard

JA: Johan Andersen

SO: Stefan Olberg

*: species new to Norway

+: species on the Norwegian red list (Direktoratet for Naturforvaltning 1999).

LIST OF SPECIES

Carabidae

Microlestes minutulus (Goeze, 1777)

AK Oslo: Sognsvann (EIS 28) July 1999. One specimen in a pitfall trap situated close to an arable field (leg. & coll. JA). The soil at the place is dry, silt-mixed sand covered by low, but rather dense vegetation of e.g. *Rumex acetosella, Cerastium arvense, Sedum telephium, Potentilla argentea, Linaria vulgaris, Hypericum perforatum, Knautia arvensis, Achillea millefolium* and different species of grasses (Poaceae). The carabid beetle fauna also indicates dry conditions with such species as *Notiophilus aestuans* Motschulsky, 1864, *Amara aenea* (De Geer, 1774), *A. convexior* Stephens, 1828, *Harpalus luteicornis* (Duftschmid, 1812) and *H. rubripes* (Duftschmid, 1812). *M. minutulus* is common in open, dry habitats in South Sweden, e.g. on Øland and Gotland (JA personal observation). The species seems to have expanded north- and westwards in Sweden in recent time, among others to Vr, which is the province most adjacent to South-East Norway (Lindroth 1986). The occurrence in **AK** was therefore not unexpected. However, despite that the place has been thoroughly investigated after 1999, no further specimens have been collected. It is uncertain,

therefore, whether the species has established within the area.

Staphylinidae

Bledius occidentalis Bondroit, 1907

The material from Sweden and Denmark that previously had been determined to *Bledius crassicollis* Lacordaire, 1835 belongs to *B. occidentalis* (Palm & Lundberg 1993). In Norway *B. crassicollis* has been published from **AK** Oslo: Bogstavann and **STI** Trondheim: Strinda (now Trondheim) (Strand 1961, Andersen 1962). The material from **STI** has been re-examined and according to the key in Freude et al. (1964), the specimens are undoubtedly *B. occidentalis* (see also Tømmerås & Breistein 1995). We have not seen the single specimen from **AK** Oslo, but it is reasonable to believe that it also belongs to *B. occidentalis*. Thus, *B. occidentalis* should be added, and *B. crassicollis* omitted from the Norwegian list of Coleoptera. *B. occidentalis* previously occurred in numerous quantities on clayish soil at the locality in **STI** Trondheim: Trondheim (Andersen 1962). The area is now completely changed, but there are still some small patches with virgin soil where the species is rather abundant (observed May 2000).

Habrocerus capillaricornis (Gravenhorst, 1806) +

VE Larvik: Kjerringberget (EIS 19) 23 June 2000. One specimen was sifted from dead plant material surrounding a dead birch (*Betula pendula*) (leg. & coll. SO). In Norway previously reported from **AK** Oslo: Røa (Lindroth 1960). *H. capillaricornis* is a forest species occurring under dead leaves or twigs or under bark (Palm 1966).

**Gyrophaena joyioides* Wüsthoff, 1937 +

AK Oslo: Sognsvann (EIS 28) 9 July 1999. >250 specimens in a sporocarp of a mushroom growing on a rotten stub of a deciduous tree in moist deciduous forest near a brook (leg. JA, coll. SO and JA); 11 August 2001. 6 specimens in mushrooms (leg. & coll. FØ). **VE** Larvik: Kjerringberget (EIS 19) 5 June 1999. One ♂ on a living sporocarp of the polypore *Fomes fomentarius* growing on a fallen log of birch (*B. pendula)* (leg. & coll. SO). **HES** Åsnes: Flisa (EIS 47) 13 July 2003. 1 specimen netted in the evening (leg. & coll. FØ). According to Palm (1968) *G. joyioides* has the same mode of life as *G. joyi* Windley, 1924, i.e. it lives in mushrooms growing on rotten wood in moist forest. On the other hand Hansen (1954) mentions that the species is very little fastidious regarding host selection, and it also occurs in mushrooms growing on the forest floor. *G. joyioides* is widely distributed in Sweden from Sk to Nb (Lundberg 1995).

Elateridae

Athous mutilatus Rosenhauer, 1847 +

AK Bærum: Haslum (EIS 28) 14 July 1999. A single specimen was caught on a sunny afternoon on a bark-free area of a standing, hollow *Fraxinus exelsior* (leg. & coll. SO). The species lives in moist, rotten fungus-infected wood of hollow trees, especially at places previously attacked by other insects. The larva should partly be xylophagous, partly carnivorous (Palm 1959, Koch 1989). *A. mutilatus* is typical of primeval forests and it seems to be rare at most places. However, the imaginal life span is short and it may be nocturnal (Hansen 1966). The species may therefore have been overlooked to some extent. The only other report of the species from Norway is **VE** Larvik: Bøkeskogen (Borgersen 1989).

Agriotes sputator (L., 1758) +

VE Larvik: Kjerringberget (EIS 19) 27 June 2000. One specimen was sweep netted on a blooming pine (*Pinus sylvestris*) together with several other species of Elateridae (leg. & coll. SO). The species has previously been recorded from **Ø** and **AK** (Vik 1991). The larvae are soil dwelling and live on plant roots, e.g. of *Trifolium* (Hansen 1966).

Eucnemidae

**Isorhipis marmottani* Bonvouloir, 1871 +

VE Larvik: Røysa (EIS 19) 6 July-20 August 1997. 1 specimen collected in a window trap (leg. A. Fjellberg, coll. FØ). 5 July 2000. 1 specimen was found on a large dead stem of aspen (*Populus tremula*) (leg. & coll. SO). The species has recently also been collected in window traps in **AAY** and **TEY** (S. Ligaard, pers. comm.). This xylophagous species is typical of primeval forest in Central Europe (France, former Czechoslovakia) where the main host should be *Carpinus betulus* (Koch 1989). This tree species does not occur naturally in Norway (Mossberg et al. 1995) and it is possible that aspen is the usual host in Norway. *I. marmottani* has recently also been found in Småland (Sm) in Sweden (Lundberg 2002) and in Estonia (Muona 1995), but it has, to our knowledge, not been recorded in any other countries in northern Europe.

Anobiidae

Anobium fulvicorne Sturm, 1837 +

VE Larvik: Kjerringberget (EIS 19) 11 July 1997. A single specimen was collected under bark of a deciduous tree in primeval, mixed forest (leg. & coll. SO). The only other Norwegian record is from **TEY** Kragerø: Jomfruland (Ødegaard 1994). The species lives in dry twigs of various deciduous trees (Koch 1989).

Melyridae

Nepachys cardiacae (L., 1761) +

VE Larvik: Kvelde (EIS 19) 5 July 2000. One specimen sweep netted in an old, mixed forest (leg. & coll. SO). The other Norwegian provinces where the species has been recorded are **Ø, AK, HEN** and **ON** (Vik 1991). As other members of the subfamily Malachiinae the imagines visit flowers. The larvae of the Malachiinae are generally carnivorous (Koch 1989) but little seems to be known about the ecology of the larvae of *N. cardiacae*.

Ciidae

Ropalodontus perforatus (Gyllenhal, 1813) +

VE Larvik: Kjerringberget (EIS 19) 18 May 1997. Some specimens were hatched from a sporocarp of the polypore *F. fomentarius* (leg. & coll. SO), which is the preferred host of the species (Palm 1959, Koch 1989, own observations). Previous Norwegian records of *R. perforatus* were from **AAY, HOY** and **AK** (Vik 1991, Thunes 1994, Hågvar 1999).

Ropalodontus strandi Lohse, 1969 +

ON Nord-Fron: Vinstra (EIS 62) 16 June 1994. More than 100 specimens were hatched from a dead sporocarp of *F. fomentarius* on a stub of *Betula pendula* (leg. & coll. JA). Contrary to the preceding species *R. strandi* has a northern distribution. It has previously been found in **HEN, TRY, TRI** and **FØ** (Vik 1991). The preferred host is *F. fomentarius* (Fossli & Andersen 1998).

Oedemeridae

Ischnomera caerulea (L., 1758) +

VE Larvik: Kjerringberget (EIS 19) 14 July 1996. A single specimen was found on a flower growing on a rocky beach (leg. & coll. SO). In Norway previously recorded from **AK, TEY** and **AAY** (Vik 1991). *I. caerulea* is xylophagous, but it does not seem to be specific regarding host selection. Thus *Quercus*, *Ulmus*, *Fagus* as well as *Acer* are reported as host of the species (Palm 1959, Koch 1989). The imagines visit flowers.

Aderidae

Pseudeuglenes pentatomus (Thomson, 1864) +

AK Nesodden: Berger (EIS 28) 2 July 1998. One specimen sweep netted on a tree (leg. & coll. SO). The other known province for this species in Norway is **TEY** (Lindroth 1960). In Sweden *P. pentatomus* has repeatedly been found on *Populus tremula*, in one case larvae occurred abundantly in a resupinate polypore on a fallen log (Palm 1959).

As stated by Larsson (1973) the larvae may therefore be mycetophagous.

Melandryidae

Orchesia luteipalpis Mulsant & Guillebeau, 1857 +

VE Larvik: Kjerringberget (EIS 19) 24 June 2000. One specimen hatched from a sporocarp of the polypore *Inonotus radiatus* (leg. & coll. SO). This very rare species has previously only been found in two provinces elsewhere in Fennoscandia: **VAY** in Norway and Bo in Sweden. The closest occurrences are in Latvia and northern Germany (Lindroth 1960, Lundberg 2002). The preferred host of this mycetophagous species should be *I. radiatus* (Koch 1989), which occurs particularly on *Alnus* (Ryvarden & Gilbertson 1993). According to Koch (1989), *O. luteipalpis* occurs in primeval forests in Central Europe.

Chrysomelidae

Crepidodera aurata (Marsham, 1802) +

AK Bærum: Dæhlivann (EIS 28) 6 July 2001. Two specimens were sweep netted in herbaceous vegetation (leg. & coll. SO). Previous Norwegian record was from **HES** (Vik 1991).

Curculionidae

Lymantor coryli (Perris, 1855)

AK Bærum: Hosle (EIS 28) 30 July 2002. One specimen in a twig of a deciduous tree (leg. & coll. SO). Previous Norwegian records were from **VE**, the south-west coast of Norway and **STI** (Andersen & Hanssen 1994). The species is polyphagous, but it prefers *Corylus avellana* and *Rhamnus cathalica* (Koch 1992).

DISCUSSION

A majority of the species reported here are from Vestfold county (VE). This province certainly has an appreciably higher number of species than known at present, since the sampling effort has been rather low. Contrary to this, Akershus (AK) is among the most thoroughly investigated Norwegian provinces. Nevertheless, a considerable number of new species has been reported in this province in recent time. In addition to the six species mentioned in the present paper an examination of literature (Økland & Hågvar 1994, Hansen & Sagvolden 1995, Sagvolden & Hansen 1996, 2001, Zachariassen 1996, Hågvar & Økland 1997, Hansen et al. 1998, Hågvar 1999, Ødegaard 1999, 2001, Ødegaard & Ligaard 2000, Sverdrup-Thygeson & Ims 2002) revealed that at least 53 species have been reported for the first time in AK in the period 1993-2002. These new species may be grouped in the following categories (number of species in brackets): saproxylic species (21 or 22), synanthropic species favoured by, or confined to anthropogenic habitats (10), phytophagous species on trees or herbs (8), aquatic or semi aquatic species (6), species in other habitats (6), species new as a result of revision of pairs of sibling species (7). The new synanthropic species, including *Microlestes minutulus*, are expanding species and they are no doubt of recent origin in our country (Ødegaard 2001). With increasing human transport and trade, as well as increasing availability and abundance of anthropogenic habitats, there is no reason to believe that the immigration of new species will stop (Ødegaard 1999). Furthermore, with the expected global warming (Schneider 1992) new, thermophilic Coleoptera are expected to invade and establish in Norway.

Contrary to this, the saproxylic species are supposed to be of old origin in the country. The fact that a majority of the species reported for the first time in AK in the last decade are saproxylic, is no coincidence. The probability of detection of many tree-living species is low due to e.g. a cryptic mode of life, low population density or a short imaginal activity period. High sampling effort and new collecting methods (especially window traps) have however, yielded many new species in AK and other provinces in recent time (see e.g. references above). For this reason we find it unlikely that *Isorhipis marmottani* should be an expanding species as suggested by Muona (1995). Thus, the species is restricted to primeval forests and most

of the new finds have been made in window traps. In the future, new species will therefore certainly be added to the list of beetle species occurring in AK and also in the remaining country.

Aspen is a tree harbouring an exclusive assemblage of saproxylic species (Siitonen & Martikainen 1994, Sverdrup-Thygeson & Ims 2002). Some of these species (mostly Buprestidae, Cerambycidae and Scolytidae) are comparatively host specific and seem to use aspen or at least *Populus* sp. as host within their whole distributional range (Koch 1992). Other species utilizing more decomposed wood are generally less host specific, but some of them seem to be restricted to, or prefer aspen, at least in Fennoscandia (Palm 1959, Koch 1989). *Pseudeuglenes pentatomus* may be one such species although we have no information about its host selection outside Scandinavia. It is also possible that *I. marmottani* may be added to this group, but the knowledge about its host selection in Scandinavia is almost absent.

I. marmottani and *Orchesia luteipalpis* seem to have isolated, northern occurrences in Scandinavia. There is a possibility that these populations represent remainders from the post glacial climatic optimum or from a more recent period when primeval forest in Europe had a much more continuous distribution. Hence, the two species may be regarded as relicts in Scandinavia. These two species, together with a considerable number of others, demonstrate that it is important to protect the few remaining areas with virgin, deciduous forest in the northernmost part of the nemoral and boreonemoral zones.

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Notiphila (Dichaeta) caudata Fallén, 1813 (Diptera, Ephydridae) in Norway

Lita Greve, Lars Ove Hansen & Knut Rognes

Greve, L., Hansen, L.O. & Rognes, K. 2003. *Notiphila (Dichaeta) caudata* Fallén, 1813 (Diptera, Ephydridae) in Norway. Norw. J. Entomol. 50, 137-138.

The norwegian material of *Notiphila (Dichaeta) caudata* Fallén, 1913 is revised, and records are present from the following norwegian localities: **AK** Oslo: Østensjøvannet (EIS 28) 1996, **RY** Sandnes: Espeland (EIS 7) 1988, and **HOI** Bergen: Åsane (EIS 40) 2003.

Key words: *Notiphila (Dichaeta) caudata,* Diptera, Ephydridae, Norway.

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INTRODUCTION

The family Ephydridae is well represented in Fennoscandia and Denmark. Hackman (1980) lists 105 species from Finland; Petersen (2001) records 86 species from Denmark and he indicates that several more are likely to occur. The family has not been surveyed in Norway recently, and Ottesen (1993) estimates only 50 species from the country.

The genus *Notiphila* can be recognised among other ephydrids on the three to four long, dorsal setae on the mid tibiae. *N. caudata* is a black fly, the arista with several distinct rays dorsally and the mouth-opening is large. It is placed in the subgenus *Dichaeta*, see Chandler (1998) and Petersen (2001), which differs externally from *Notiphila s.s.* in having two to three fairly short, robust facial setae on each side almost as stout as ocellars and verticals, while *Notiphila s.s.* has only several very fine setae. There is a distinct bend half way along the vein Radius 1. Males of *N. caudata* are at once distinguished by the very long, stout marginal setae on the fourth tergite, and the unusual upturned, conical fifth tergite (Dahl 1959, Drake 2001). The larvae are aquatic.

THE RECORDS

AK Oslo: Østensjøvannet, Nothern shore (EIS 28) 4 ♂♂ 1-31 July 1996 (malaise-trap); Østensjøvannet, Manglerud (EIS 28) 3 ♂♂ 1-31 July 1996 (malaise-trap), leg. L.O. Hansen & M. Falck, col.: Zoological museum, University of Oslo. **RY** Sandnes: Espeland (EIS 7), 2 ♂♂ 12 May 1988, leg. K. Rognes, col.: K. Rognes private collection. **HOY** Bergen (Åsane): South edge of Kråvatnet (EIS 40), 6 ♂♂ 8 ♀♀ netted on *Carex* sp. 29 August 2003, leg. L. Greve & G. Bakkerud, col.: Zoological museum, University of Bergen.

The malaise-trap run at the northern shore of lake Østensjøvann was situated only a few meters from the shore, while the trap at Manglerud was situated in a slope about 100 m from the edge. This part of lake Østensjøvann is a typical freshwater shore dominated by *Phragmites communis* together with other limnic shore plants (e.g. *Iris*, *Typhae*, *Juncus*), and some alder forest (*Alnus incana*) as well. The records were mentioned by Hansen & Falck (2000). More information about the biology at lake Østensjøvann is given by Hansen & Falck (2000).

Rognes (1996; p. 273) mentions *N. caudata* from Norway with the abbreviation «VL» = Vestlandet (i.e. W Norway), and this refers to the record from Sandnes.

The material from Bergen was collected in an insect survey along the Haukås river during the summer 2003. A malaise trap, opened in late April and closed in late September, was situated close to the river approximately 75 m east of the location where the flies were netted, but no additional specimens were caught.

There are also two dry-mounted specimens, one male and one female, of *N. caudata* in Zoological Museum, University of Oslo. Both have tiny square, black labels, but without any information. This material has been examined by the senior author and the specimens are correctly determined.

Acknowledgement. We wisk to thank Morten Falck, Oslo, for help during the field work at Østensjøvannet, and to Gudrun Bakkerud, Zoological Museum, University of Bergen, for her enthusiastic participating in all the field work during the Haukås-river insect survey. Furthermore thanks to Miljøvernavdelinga, Bergen kommune for financial support to the investigation in the Haukås-river, and to Østensjøvannets venner, Oslo, for financial support in the survey at lake Østensjøvann.

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Baranowskiella ehnstromi Sörensson, 1997 (Coleoptera, Ptiliidae), the smallest known beetle in Europe, recorded in Norway

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Andersen, J., Hanssen, O. & Ødegaard, F. 2003. *Baranowskiella ehnstromi* Sörensson, 1997 (Coleoptera, Ptiliidae), the smallest known beetle in Europe, recorded in Norway. Norw. J. Entomol., 50, 139-141.

Baranowskiella ehnstromi Sörensson, 1997 is reported for the first time from Norway where it has been found in some localities in the southern, western and central parts (**AK, MRI, STI**). The species was found in the tubes of the saproxylic polypore species *Phellinus conchatus* (Pers.: Fr.) Quél. and *P. punctatus* (Karst.) Pilát. The host choice, habitat selection and distribution of the species are discussed.

Key words: Coleoptera, Ptiliidae, *Baranowskiella ehnstromi*, Norway, host selection

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INTRODUCTION

The tribe Nanosellini within the family Ptiliidae comprises the smallest beetles in the world regarding length and especially volume (weight) since the species are extremely slender compared with other members of the family (Sörensson 1997). A new genus and species, *Baranowskiella ehnstromi* Sörensson, 1997, has recently been described from Europe and had until now only been reported from Sweden and Finland (Sörensson 1997). This species has now also been found at some places in Norway. In the following we give a short characterization of the species, present the Norwegian records and give new information about the ecology of this unique member of the European beetle fauna. The material collected by J. Andersen is deposited at the Department of Ecology/Zoology, University of Tromsø, whereas the material collected by O. Hanssen and F. Ødegaard is deposited in their private collections.

THE SPECIES

Baranowskiella ehnstromi can be distinguished from all other European Ptiliidae (and Coleoptera) on the following combination of characters: extremely small (length 0.49-0.56 mm) and slender (3.3-3.7 X longer than wide; All other European Ptiliidae are < 3.0 X longer than wide); body very pale but head more or less dark brown; antennae 10-segmented, 9-10 segments forming a club (in all other European Ptiliidae species the antennae have 11 segments) (information mainly from Sörensson 1997). The extremely slender body shape of this and the other species of Nanosellini is an adaptation to live in the tubes of fruiting bodies of fungi where they mainly seem to feed on spores. *B. ehnstromi* was until now exclusively reported from the fruiting bodies of the saproxylic (tree-inhabiting) polypore *Phellinus conchatus* (Pers.: Fr.) Quél (Hymenochaetaceae) (Sörensson 1997).

THE NORWEGIAN RECORDS

AK Oslo: Bygdøy (EIS 28) 14 October 2001. 5 imagines in the tubes of a living sporocarp of *Phellinus conchatus* growing on a stump of *Salix* sp. situated in rather shady, mixed forest (leg. and coll. J. Andersen); Smestad October 2002. 20 imagines in the tubes of a piece of *P. punctatus* (P. Karst.) Pilát. growing on a standing, dead stem of *Corylus avellana* situated in shady, deciduous forest close to a brook (leg. and coll. J. Andersen); Nannestad: Tømte (EIS 37) 4 June 1994 one specimen on *P. conchatus* (leg. and coll. F. Ødegaard, for fungus leg. O. Smith). **MRI** Nesset: Øvre Vike (Eikesdal) (EIS 78) 18 August 2000. Some imagines and larvae in dense forest dominated by *C. avellana* (leg. and coll. O. Hanssen). **STI** Trondheim: Skogstad (EIS 92) 25 August 2000 and 25 August 2001. Some imagines and larvae in rather exposed position at the edge of a somewhat moist arable field (leg. and coll. O. Hanssen and F. Ødegaard); Trondheim: Trondheim (EIS 92) 2 September 2002 and 23 July 2003. Several imagines in a slope with semiexposed deciduous forest (leg. and coll. O. Hanssen). All the specimens from **MRI** and **STI** were collected in the tubes of *P. conchatus* growing on *Salix caprea*.

DISCUSSION

Since all previous records of *Baranowskiella ehnstromi* has been made in the sporocarps of *Phellinus conchatus*, it was supposed to be restricted to that polypore species (Sörensson 1997). However, as is evident from our investigations *B. ehnstromi* is well able to establish in the resupinate polypore *Phellinus punctatus* which forms extensive, thick mats on standing, dead stems of various deciduous trees (Ryvarden & Gilbertson 1994, Olofsson 1996). It is likely that *B. ehnstromi* lives in other species of the genus as well. Thus, *P. punctatus* belongs to a group of closely related species (the *robustus*-complex) among which two (*P. robustus* (P. Karst.) Bourdot & Galzin and *P. hippophäecola* H. Jahn) also are present in Scandinavia. We find it less likely that *B. ehnstromi* discriminates between such closely related species of the genus since it seems to be unable to select distinctly between *P. punctatus* and *P. conchatus* which are less closely related to each other (Ryvarden & Gilbertson 1994). The pore size of the fruiting bodies could, perhaps, be one of the determining factors in the host selection of *B. ehnstromi*. However, a wide variety of *Phellinus* species (including some confined to coniferous trees) have a pore size within the limits of those of *P. conchatus* and *P. punctatus* (Ryvarden & Gilbertson 1994) and pore size alone therefore hardly delimit the host selection of the beetles much.

Our records of *B. ehnstromi* indicate that the species has a rather wide habitat amplitude since it has been collected both in dense, moist forest, in semiexposed forest stands and in rather open, although somewhat moist, terrain with single trees. *B. ehnstromi* was found in 2 of 8 investigated *Salix caprea* trees infected with *P. conchatus* in Trondheim, so only a comparatively small fraction of the hosts within an area may be infected with the beetle. Nevertheless, the occurrences at Smestad in Oslo and in Trondheim show that the species is able to establish in small forest stands in urbanized areas. One of the reasons for this may be that *B. ehnstromi* lives on long lasting resources. Thus, *P. conchatus* and *P. punctatus* are perennial and long lived species (e. g. Ryman & Holmåsen 1992) and fruit bodies may exist on the same unit (stem, stump) for many years. Low spreading capacity is mainly a feature of species living in stable habitats and on resources of long durability (e. g. Southwood 1977, Martin 1989). Sörensson (1997) also found several indications of some sort of reduction of the flight ability of *B. ehnstromi*, e. g. reduced number of alar trichia compared with in most other European Ptiliidae species. On the other hand, the capacity for flight of *B. ehnstromi* is not known and needs to be tested experimentally (Sörensson 1997). Our impression is that *B. ehnstromi* has a patchy distribution on a smaller scale. Accordingly, we have investigated several sporocarps of *Phellinus conchatus* within areas in **MRI** and **STI** without finding the beetle species whereas it partly was present in the vicinity.

The localities where *B. ehstromi* has been found in Norway, are situated in the boreonemoral and southern boreal zones (Moen 1999). In Sweden, the species has been found in several provinces

from the southernmost part (Sk) north to Nb. Sk is situated in the nemoral zone, most of Nb in the middle boreal zone (Moen 1999). Thus, the species is present in a majority of the vegetational zones in Central and North Europe.

At present, *B. ehnstromi* has only been found in Sweden, Finland (Ab, which is the southernmost province in the country) (Lundberg 2002) and Norway. However, we find it highly unlikely that a species dependent upon forest or at least trees should be a Fennoscandian endemism, considering the pre-history of the area (Andersen 1988). Due to its extremely small size, light colour and special mode of life the species has no doubt previously been completely overlooked, also in Fennoscandia. The species should be searched for not only in *Phellinus conchatus* and *P. punctatus*, but also in other species of the genus, including those confined to conifers. In fact, it can not be overlooked that *B. ehnstromi* also occurs in polypore species of other genera. Most likely such investigation will reveal a more extended distribution of *B. ehnstromi* than known at present. This is also indicated by the fact that the species occurs in a majority of the vegetational zones that are present in Central/North Europe and that the two known hosts have a wide distribution (Ryvarden & Gilbertson 1994).

Acknowledgement. We are greatly indepted to Leif Ryvarden for verification or identification of specimens of *Phellinus conchatus* and *P. punctatus*.

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Bokanmeldelser • book reviews

Geller-Grimm, F, 2003: Fotoatlas und Bestimmungsschlüssel der Raubfliegen Deutschlands. CD-Rom, Ampyx Verlag, Halle (Saale). ISBN 3-932795-18-0. Pris 25 Euro + frakt. Bestilles fra forlaget: Ampyx Verlag, Dr. Andreas Stark, Seebener Str. 190, D-06114 Halle (Saale), Deutschland (Germany), Email: ampyx@aol.com.

Rovfluene (Diptera: Asilidae) er store og iøynefallende dyr, og man skulle tro de omkring 25 norske artene var godt kartlagt. Men som med så mange tovinger: det finnes dårlig med tilgjengelig og oppdatert bestemmelseslitteratur, det som finnes er enten ufullstendig når det gjelder de norske artene – eller så kostbar at prisen gjør den utilgjengelig. Da vegrer mange seg for å gi seg i kast med en familie innen en orden som har ry for å være problematisk. Hittil har Lyneborgs behandling av rovfluene i serien «Danmarks Fauna» vært den mest tilgjengelige. Men den mangler viktige norske arter og referanser til norsk fauna. Det britiske entomologmiljøet har utviklet nøkler der tydelige tegninger illustrerer de avgjørende karakterene i hvert ledd. Og nå har den tyske rovflue-eksperten Fritz Geller-Grimm tatt CD-ROM-teknologien til hjelp for å utgi en nøkkel gjennomillustrert med fotografier. En CD er billig å produsere, har plass til mange bilder, og det er enkelt å hoppe fram og tilbake mellom helhet og detaljer, sammenligne nærstående arter, osv.

Den foreliggende CD-rom inneholder bestemmelsesnøkler på tysk og engelsk til alle de 81 Asilidearter som forekommer i Tyskland. Mer enn 1900 fotografier av både habitus og detaljer gjør det mulig å sammenligne. Viktige karakterer er vist – ofte avmerket med en rød pil eller farget rødt på bildet, slik at det skal være enkelt å arbeide seg gjennom nøklene, og være sikker i bestemmelsen. Ifølge forfatter og forlag skal den være brukbar til å bestemme alle rovflue-arter som finnes i Belgia, Danmark, Tyskland, Storbritannia, Nederland og Sverige.

Det høres lovende – for vi har ingen arter i norsk fauna som ikke finnes enten i Danmark eller Sverige. Altså må vi kunne bruke denne CD'en til å bestemme alle norske rovfluer?

La det først være sagt at teknikken er et stort framskritt. De mange fotografiene gjør det mulig å vise mange detaljer og sammenligne karakterer hos arter som ligner. Mens mange bestemmelsesnøkler konsentrerer seg om hannenes genitalier, omfatter disse nøklene også hunnenes eggleggingsrør, og har bilder som gjør det mulig å bestemme både hanner og hunner av de fleste arter med stor grad av sikkerhet. Nøklene er gjennomarbeidet og grundige, og i stor utstrekning nye i forhold til eldre litteratur. Noen slekter er fortsatt problematiske, og avgrensning og omfang fortsatt omstridt. Det gjelder vesentlig i underfamilien Asilinae.

Dessverre lover reklamen mer enn den holder. Geller-Grimm har måttet melde pass når det gjelder å skaffe bilder av den svenske arten *Cyrtopogon lapponicus*, og arten *Cyrtopogon luteicornis* er overhodet ikke omtalt. Enkelte ganger er de avgjørende karakterene vanskelige å se tydelig nok på fotografiene, fordi hårkledning og mangel på tredimensjonalitet i bildet gjør konturene diffuse. Kanskje har det med oppløsningen i bildene å gjøre – digitalkameraer har ofte en svakhet her i forhold til gammeldags film. Den enkleste løsningen hadde vært å komplettere med tydelige strektegninger.

Det finnes ingen publisert liste over norske rovfluer. Derfor kan man ikke klandre Geller-Grimm for at han ikke fører opp Norge under utbredelsesoversikten for alle de artene som finnes her. Dessverre angir han som norske fire arter som iall-

fall undertegnede aldri har sett noe norsk eksemplar av. Det kan naturligvis ikke utelukkes at tyske samlere har vært på ferie i Norge og at det står beleggsmateriale i en eller annen tysk samling, men det er ikke publisert i norske tidskrifter. For tre av disse artenes vedkommende er en sannsynlig kilde Soós & Papps katalog over Palearktiske Diptera. Men den inneholder feil innen mange grupper. En erfaren dipterolog burde ha sett det og kontrollert opplysningene.

Ikke desto mindre er dette den beste muligheten til å bestemme norske rovfluer. Mange av de problematiske artene finnes ikke i Norge, og dermed er vi spart for mange vanskeligheter. Det understreker kanskje behovet for en oversikt over de norske artene, men vil utvilsomt gjøre det lettere å utarbeide en egen bestemmelsesnøkkel for vårt område. CD-ROM'en anbefales varmt, tross de påpekte svakhetene. Den har også meget gode forklaringer til terminologi, og gode råd om innsamling og preparering. Men som Geller-Grimm påpeker i forordet: Den hjelper til med bestemmelsen, men sier lite om artenes utbredelse, og spennende biologi.

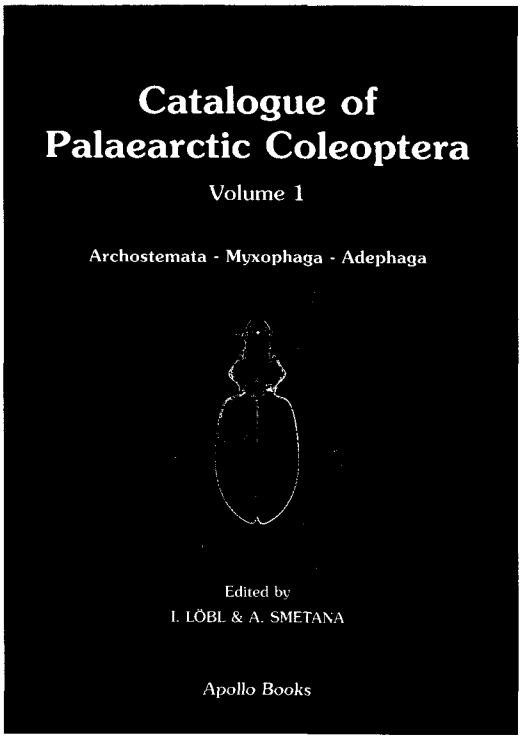
Morten Falck

Löbl, I. & Smetana, A. (Eds.) 2003. Catalogue of Palaearctic Coleoptera. Volume 1. Archostemata - Myxophaga - Adephaga. Apollo Books. 819 sider. ISBN 87-88757-73-0. DKK 900,- fra Apollo Books: apollobooks@vip.cybercity.dk.

Ytterligere en stor og ambisiøs katalogserie er startet, og denne gang er det de Palearktiske billene som skal behandles. Dette er første bind i en planlagt serie på totalt åtte bind. Formatet er hendig og boka er god å holde i. Innbindingen er solid og papirkvaliteten god, selv om arkene er noe tynne.

Et utrolig viktig arbeide, fordi her har det skjedd enormt mye de seneste årene, spesielt i de østlige deler av regionen. Mer enn 60 år må vi tilbake i tid for å finne den siste komplette Palearktiske billekatalogen. Den særdeles knappe «*Coleopterorum Catalogus Regionis Palaearctica*» til Albert Winkler kan sees på som den seneste separate oversikten. Arbeidet ble påbegynt i 1924 og ferdigstilt 1932. Åtte år seinere kom det siste bindet til W. Junk og S. Schenklings katalog over verdens biller «*Coleopterorum Catalogus*». Denne ble påbegynt allerede i 1910, og omfattet tilslutt 31 bind inkludert indeks-bindet. Dette var et meget omfattende arbeid, og betraktelig mer grundig enn Winklers katalog.

I de mystiske begrepene «Archostemata – Myxophaga» skjuler det seg kun noen eksotiske småfamilier som ikke er funnet hos oss. Adephaga derimot er betraktelig mer interessant, for her finner vi flere familier som vi også har i Norge. De mest kjente er Gyrinidae, Haliplidae, Dytiscidae, og sist men ikke minst Carabidae. Katalogdelen utgjør storparten av boka, nærmere bestemt 550 sider. De gyldige artene følger alfabetisk under hver slekt eller underslekt der det finnes. Under hver gyldig art er kjente synonymer angitt. Også utbredelsen for hver art er med. Palearktis strekker seg over tre verdensregioner, og inklu-



derer Europa, Nord-Afrika og store deler av Asia. Hele Kina inkluderes av praktiske årsaker forklart i innledninga, og deles enten i syv litt grovere områder eller 33 finere provinser der også Taiwan er med. Tilsvarende er også Bhutan, Nepal og hele den arabiske halvøy med av praktiske årsaker. Svalbard (Spitsbergen) er utskilt som separat del (SR).

Vi foretok et søk på «Carabidae + new species» i *Zoological records* database, og fikk godt over 2000 treff, mens «Carabidae + Palaearctic» gav mer enn 6700 treff. Mange nyere publikasjoner foreligger, faktisk flere hundre bare de tre siste årene. Særlig beskrives det mange nye arter fra Kina. I innledninga sier forfatterne at arbeidet strekker seg fram til 1. januar 2000, men iallfall tre arter publisert i 1999 var ikke kommet med. Dette kan skyldes tregheten i systemet før en artikkel registreres i *Zoological records*. Utover dette kontrollerte vi rundt tyve artikler med nybeskrivelser fra før 2000, og alle artene her var inkludert.

Registeret angir som sagt slekter og underslekter, men ikke arter. Dette gjør det litt vanskelig å finne fram i større slekter som foreksempel *Carabus*. Det holder ikke med at du kan binomenet, du må også vite hvilken underslekt arten tilhører. Man kan derfor bli sittende å bla ganske lenge før man finner den aktuelle arten man er på leting etter. En løpende topptekst kunnet hjulpet noe på dette. Boka hadde blitt betraktelig større skulle man satt opp hver enkel art med synonymer i registeret også.

En annen svakhet ved arbeidet, er at man ikke kan finne den originale stavemåten til et artsepitet. Hvis en art er flyttet fra en slekt til en annen og samtidig skiftet kjønn, så går ikke dette fram. Originalslekta angis i parentes, men ikke artsepitetet. Under slekta *Amara* finner vi arten *plebeja*. Denne er opprinnelig beskrevet i *Harpalus*, sannsynligvis som *plebejus*, men det oppgis ikke. I dette tilfellet kan man resonnere seg fram til den originale stavemåten, men for slekter som vi ikke umiddelbart kan se kjønnet til, blir dette vanskelig, noe som er særdeles uheldig for ustabile slekter.

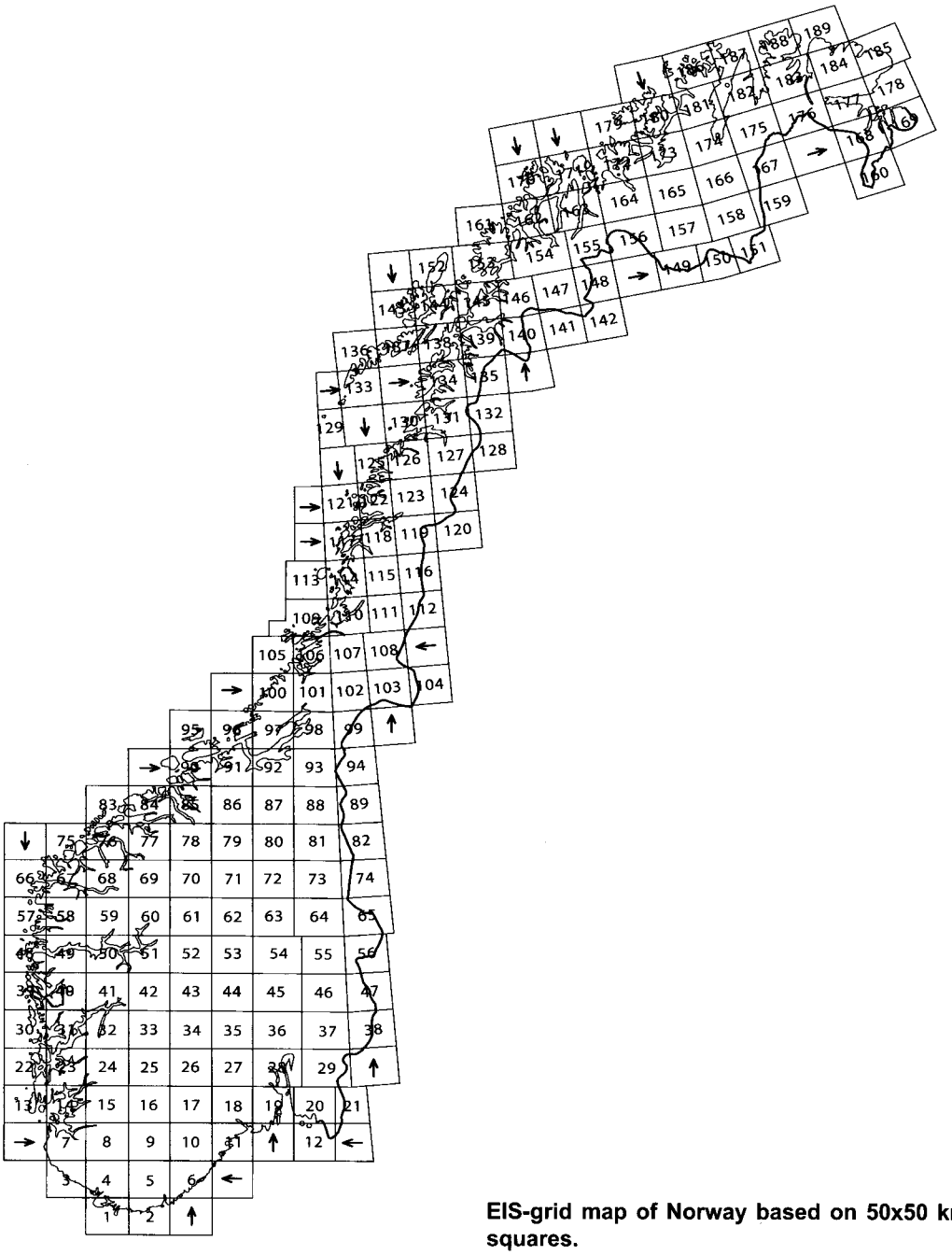
I et arbeid som dette er selvfølgelig den taksonomiske delen det grunnleggende elementet i arbeidet. Når man likevel ser på en slik milepel, bør også artenes utbredelse være akseptabelt angitt. Norge, som en del av Palaearktis, er selvfølgelig med i oversikten. De arter som er registrert fra Norge, er angitt med «NR». Så spør vi oss hvor informasjonen fra Norge er hentet fra, siden ingen norsk coleopterolog er oppført under «acknowledgement». Et standardverk i mange år var Lindroths katalog fra 1960 «*Catalogus Coleopterorum fennoscandiae et Daniae*», der Andreas Strand hadde ansvaret for den norske delen. Dette arbeidet er ikke oppført i referanselista. Et annet standardverk i denne sammenheng er Silfverbergs katalog fra 1992 «*Enumeratio Coleopterorum Fennoscandiae, Daniae et Baltiae*». Denne angir de nordeuropeiske landene med koder, og har samtidig vært angivende for nyere taxonomiske endringer. Men nei, denne er heller ikke med.

Vi har sjekket egne publikasjoner, samt nyere arbeider av andre norske coleopterologer, men få av de nyregistrerte artene fra Norge er ført opp med NR. Til og med en art som *Carabus monilis*, som opptrer som en særdeles interessant relikt hos oss, og kjent herfra i mer enn 50 år, er uteglemt fra Norge. Den framstår med en ren Mellom- og Sør-Europeisk utbredelse. Man burde ha funnet fram til en kontaktperson i hvert land som tok jobben med å sjekke de respektive artenes utbredelse. I et så ambisiøst verk bør slikt være et minimum.

Dette er utvilsomt en meget viktig milepel, og selv om det påpekes visse svakheter, må disse sees på som underordnede. Verket bør stå i hylla til enhver billesamler med respekt for seg sjøl. Utgiveren er igjen Apollo-books i Danmark. Ros til dem atter en gang, fordi vi tror ikke fortjenesten på slike arbeider er særlig stor.

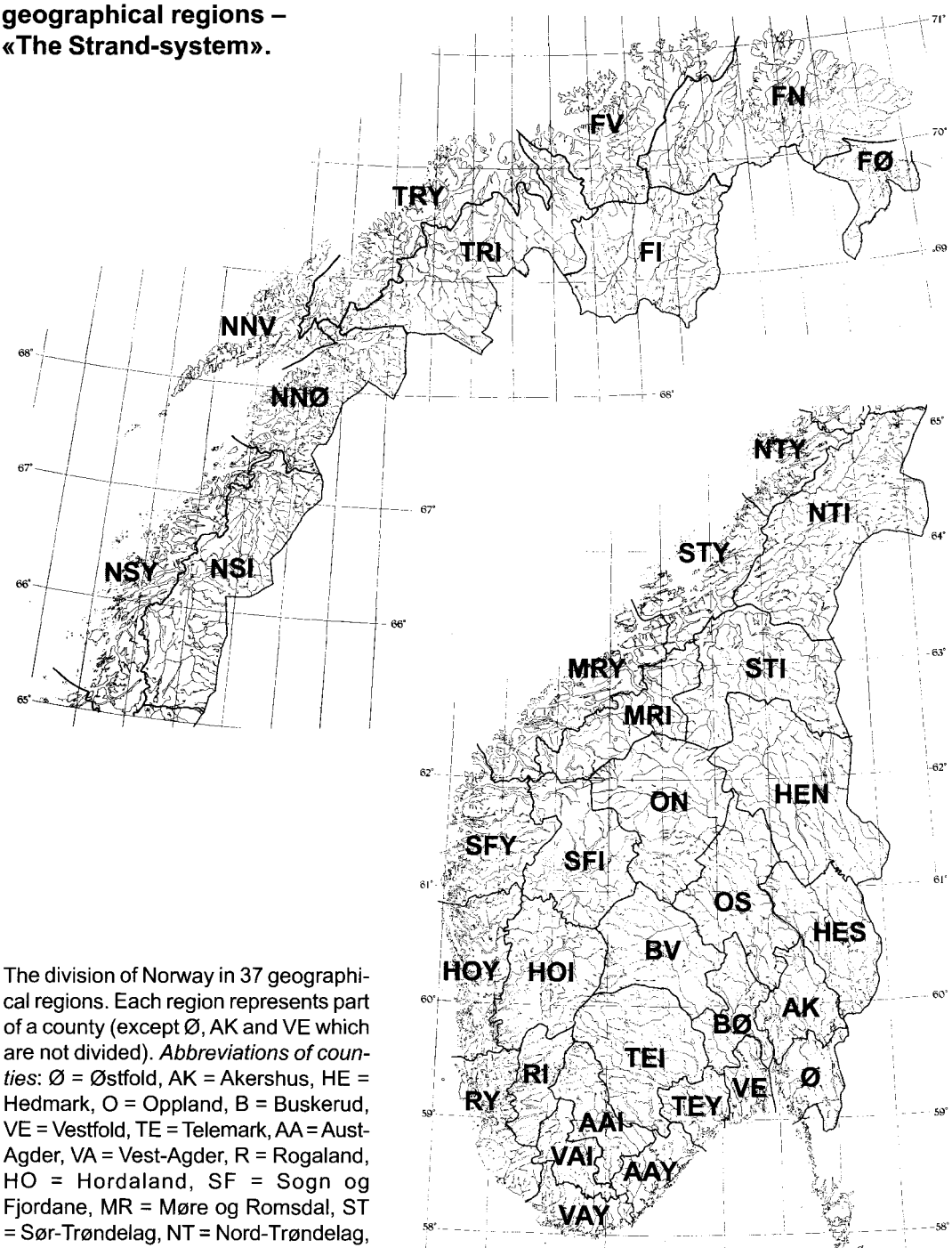
Lars Ove Hansen & Bjørn A. Sagvolden

The EIS-grid system of Norway



EIS-grid map of Norway based on 50x50 km squares.

The division of Norway in geographical regions – «The Strand-system».



The division of Norway in 37 geographical regions. Each region represents part of a county (except Ø, AK and VE which are not divided). *Abbreviations of counties*: Ø = Østfold, AK = Akershus, HE = Hedmark, O = Oppland, B = Buskerud, VE = Vestfold, TE = Telemark, AA = Aust-Agder, VA = Vest-Agder, R = Rogaland, HO = Hordaland, SF = Sogn og Fjordane, MR = Møre og Romsdal, ST = Sør-Trøndelag, NT = Nord-Trøndelag, N = Nordland, TR = Troms, F = Finnmark. *Abbreviations of subdivisions*: I = interior, Y = coastal, S = southern, N= northern, V= Western, Ø = eastern.

Norwegian Journal of Entomology

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with extended information on electronic submittance

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Running title. Please extract a running title from the original title. This will occur as a top text on each left page of the article.

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Baltic Institute of Coleopterology

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Fifth Symposium of Baltic Coleopterologists

Szklana Huta, Poland: 8–11 September 2004

The main subject of the Symposium will be:
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In according to tradition of former Symposia, all oral and poster presentations will be accepted on any topic related to Worlds Coleoptera

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The official language of the Symposium will be English

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EUR 60 late registration (EUR 40 students) including conference documentation (book of abstracts, etc.), coffee, light meals, excursions to bog reserve or xerophilic fields.

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Information

The present journal is a continuation of **Fauna norvegica Series B** (Norwegian Journal of Entomology). With Volume 45 (1998) the publication of this journal by the Foundation for Nature Research and Cultural Heritage Research (NINA-NIKU) has been discontinued. Starting with Volume 46, the journal is published as **Norwegian Journal of Entomology** by the Norwegian Entomological Society. Editor is Professor Lauritz Sømme, University of Oslo.
