

The European species of the *Eubazus aliochinoi*-group (Hymenoptera: Braconidae: Helconinae: Brachistini)

C. van Achterberg

Achterberg, C. van. The European species of the *Eubazus aliochinoi*-group (Hymenoptera: Braconidae: Helconinae: Brachistini).

Zool. Med. Leiden 74 (20), 29.xii.2000: 339-357, figs 1-58.— ISSN 0024-0672.

C. van Achterberg, Afdeling Entomologie (Hymenoptera), Nationaal Natuurhistorisch Museum, Postbus 9517, 2300 RA Leiden, The Netherlands (e-mail: achterberg@naturalis.nnm.nl).

Key words: Hymenoptera; Braconidae; Helconinae; Brachistini; *Eubazus*; *Eubazus aliochinoi*-group; *Allodorus*; Palaearctic; Europe; key; Coleoptera; Curculionidae; Pissodinae; *Magdalis*.

Five new European species of the subgenus *Allodorus* Foerster s.l. belonging to the *Eubazus aliochinoi*-group (Braconidae: Helconinae: Brachistini) are described and illustrated: *E. shishiniovae* spec. nov. from Bulgaria, *E. zelinensis* spec. nov. from Bulgaria, *E. tricoloripes* spec. nov. from The Netherlands and England, *E. glabriclypealis* spec. nov. from Switzerland, France and Bulgaria, and *E. convexope* spec. nov. from Scotland. A key to the European species of the *Eubazus aliochinoi*-group is added. *Eubazus rufithorax* (Tobias, 1986) (not *Eubazus rufithorax* Abdinbekova, 1969) is renamed as *E. (Aliolus) regularis* nom. nov. *Eubazus denticlypealis* (Tobias, 1986) is a new combination, and *E. corrugatus* (Ruthe, 1867) is a new synonym of *E. rugosus* (Ratzeburg, 1848).

Introduction

The genus *Eubazus* Nees, 1814 (Braconidae: Helconinae: Brachistini) is rather large with a world-wide distribution, but most diverse in the northern hemisphere and South America (van Achterberg & Kenis, 2000). The taxonomic situation is complicated because of the misinterpretation of available names, and the subtle differences between the species. The resulting confusion has continued up to now (e.g., Tobias, 1986; Belokobylskij, 1998), augmented by the use of several genera for the group of closely related species involved (mainly *Eubadizon* Nees, 1834, *Eubazus* Nees, 1814, *Brachistes* Wesmael, 1835, and *Allodorus* Foerster, 1862), which in fact all belong to one genus: *Eubazus* Nees, 1814 (van Achterberg, 1990a). In this paper the European species belonging to the subgenus *Allodorus* Foerster, with acute submedial lobe or tooth on their tarsal claws (*E. aliochinoi*-group) are revised. In Europe the group is represented by five new species, which are described below. Through the kindness of Dr S.A. Belokobylskij (St. Petersburg) the types of the other known (East Palaearctic) species of the group could be examined: *Eubazus aliochinoi* Belokobylskij, 1998, *E. sancha* Belokobylskij, 1998, and *E. terminalis* Belokobylskij, 1998.

Eubazus species are ovo-larval koinobiont endoparasitoids of predominantly Curculionidae larvae. At least part of the species lay their eggs in eggs of the host or very young larvae, develop internally when the host larva is full-grown and have a final ectoparasitic phase (Haeselbarth, 1962; Alauzet, 1987). The biology of the members of the *E. aliochinoi*-group is hardly known. In this paper one species (*E. convexope* spec. nov.) is reported having been reared from *Betula* twigs infested by *Magdalis carbonarius* (Linnaeus, 1758) (Coleoptera: Curculionidae: Pissodinae). Less certainly, Tobias (1986) gives under "*Aliolus semirugosus*" (= *E. shishiniovae* spec. nov.) as hosts *Rhytisma quercus* (Linnaeus, 1758), and *Pissodes* species (both Coleoptera: Curculionidae). The latter record may be the result of the confusion of this species with species

of *Allodorus* s.s. (sensu van Achterberg & Kenis, 2000) on Pissodinae in coniferous trees, which lack the additional tooth of the tarsal claws (van Achterberg & Kenis, 2000).

For the recognition of the subfamily Helconinae, the tribe Brachistini and the genus *Eubazus* Nees, see van Achterberg (1990b, 1993, 1997), for the subgenus *Allodorus* Foerster, see van Achterberg & Kenis (2000) and for the terminology used in this paper, see van Achterberg (1988).

Subfamily Helconinae Foerster, 1862

Tribe Brachistini Foerster, 1862

Genus *Eubazus* Nees, 1814

Eubazus Nees, 1814: 214; Shenefelt, 1970: 230; van Achterberg, 1990a: 4-5. Type species (designated by Viereck, 1914): *Eubazus pallipes* Nees, 1814 [lost]. For synonyms, see van Achterberg & Kenis, 2000: 430.

Subgenus *Allodorus* Foerster, 1862

Allodorus Foerster, 1862: 242; Shenefelt, 1970: 229; van Achterberg, 1990a: 5. Type species (by monotypy): *Eubazus semirugosus* Nees, 1814.

***Eubazus aliochinoi*-group**

Diagnosis.— As given by van Achterberg & Kenis (2000) for the subgenus *Allodorus*, but tarsal claws with small submedial acute lobe or tooth (figs 9, 20, 32, 46, 57), which may be obsolescent; clypeus straight or protruding medio-apically, not upcurved (figs 2, 36, 49); posterior half of hind coxa largely smooth, only with a few striae (fig. 10); hind tibia largely dark or fuzzy brown dorsally (except basally; figs 10, 56); second and third metasomal tergites partly or nearly completely finely sculptured, or completely smooth (figs 11, 19, 30); second tergite with or without sharp lateral crease (figs 6, 28).

Distribution.— Palaearctic, but likely to be Holarctic because it is represented in the Northeast Palaearctic region. Three East Palaearctic species and the five European species described below are known so far.

Biology.— Probably ovo-larval endoparasitoids of Curculionidae associated with non-coniferous trees, but only one species has been reared.

Key to European species of the *Eubazus aliochinoi*-group

- 1. Tarsal claws with small protuberance medio-ventrally (figs 9, 20, 32, 46, 57), if sometimes obsolescent, and tarsal claws comparatively wide medially, then hind coxa finely obliquely striate (fig. 10) and second metasomal tergite sculptured; hind tibia (except basally) usually largely dark or fuzzy brown dorsally 2
- Tarsal claws simple, usually rather slender medially; hind tibia usually completely reddish- or yellowish-brown or nearly so; hind coxa largely smooth, usually with a ruga, if coarsely obliquely striate then second tergite smooth others species-groups

2. Posterior half of hind coxa finely obliquely striate; clypeus somewhat concave medio-apically and somewhat upcurved *E. (Brachistes) vagus*-group
- Posterior half of hind coxa largely smooth, only with a few striae (fig. 10); clypeus straight or protruding medio-apically, not upcurved (figs 2, 36, 49); (*E. aliochinoi*-group) 3
3. Malar space ventrally and area between clypeus and eye smooth (figs 2, 6, 14, 15), or nearly so; clypeus flattened dorsally (fig. 6); third metasomal tergite with sharp lateral crease (figs 6, 15); medio-ventral tooth of clypeus present (figs 2, 14), rarely obsolescent 4
- Malar space ventrally and area between clypeus and eye finely striate (figs 25, 28, 36, 37); clypeus distinctly convex dorsally (figs 28, 37); third tergite without sharp lateral crease (figs 28, 37, 52); medio-ventral tooth of clypeus absent (figs 36, 49), but small tooth present in *E. zelinensis* (fig. 25) 5
4. At least basal half of third metasomal tergite distinctly sculptured (fig. 11); frons distinctly rugose medio-anteriorly (fig. 3); median length of third metasomal tergite about equal to median length of second tergite (fig. 6); clypeus punctate (fig. 2); fourth-seventh tergites largely retracted (fig. 6); hind femur largely smooth; scapus yellowish ventrally; vein cu-a of fore wing about as long as vein 1-CU1 (fig. 1) *E. shishiniovae* spec. nov.
- Basal half of third tergite smooth or nearly so (fig. 18); frons largely smooth medio-anteriorly (fig. 17); median length of third tergite 0.8-0.9 times median length of second tergite (fig. 15); clypeus largely smooth, only punctulate (fig. 14); fourth-seventh tergites distinctly exposed (fig. 15); hind femur coarsely punctate; scapus dark brown ventrally; vein cu-a of fore wing distinctly longer than vein 1-CU1 (fig. 13) *E. glabriclypealis* spec. nov.
5. Scapus yellowish ventrally; vein r of fore wing comparatively long (fig. 24); clypeus with small medio-ventral tooth (fig. 25); temples comparatively wide (fig. 26), length of eye in dorsal view about 0.9 times temple *E. zelinensis* spec. nov.
- Scapus dark brown ventrally; vein r of fore wing medium-sized (figs 35, 48); clypeus without medio-ventral tooth (figs 36, 49); temples narrower (figs 39, 50), length of eye in dorsal view about 1.3 times temple 6
6. Precoxal sulcus smooth (fig. 37), at most with some weak sculpture anteriorly; area above precoxal sulcus smooth; third metasomal tergite comparatively transverse (fig. 40); palpi brown; hind femur fuzzy brown; hind tibia (except basally) often brown or yellowish-brown dorsally, rarely dark brown; hind femur coarsely punctate; pronope medium sized and anteriorly with comparatively large and strongly shiny and smooth convexity (fig. 42), rarely reduced (fig. 43); vein SR1 of fore wing usually pale yellowish, contrasting with dark brown vein r; marginal cell of fore wing comparatively slender (fig. 35) *E. convexope* spec. nov.
- Precoxal sulcus sculptured anteriorly and medially (fig. 52); area above precoxal sulcus often distinctly punctate; third metasomal tergite less transverse (fig. 53); palpi pale yellowish; hind femur brownish-yellow; hind tibia (except basally) dark brown dorsally; hind femur largely smooth; pronope small and slightly convex (fig. 55); vein SR1 of fore wing dark brown as vein r; marginal cell of fore wing comparatively robust (fig. 48) *E. tricoloripes* spec. nov.

Eubazus (Alldorus) convexope spec. nov.
(figs 35-47)

Material.— Holotype, ♀ (NMS), “[Scotland], Kincaig, Inverness, NH 843064, ex twigs [of] *Betula* with *Magdalis carbonaria*, coll. v.[19]95, em[erged] vi/vii.[19]95, A.P. Fowles”. Paratypes (2 ♀♀ + 5 ♂♂): 1 ♀ (RMNH), id.; 4 ♂♂ (NMS, RMNH), id., but emerged v.1995; 1 ♀ + 1 ♂ (NMS), “[Scotland], Beinn Eighe NNR, W[ester] Ross, NH 015634, Mal. tr. in birchwood, 12.v-21.vi.[19]92, P.W. Brown, NMSZ 1992.169”.

Holotype, ♀, length of body 3.9 mm, of fore wing 3.6 mm, of ovipositor sheath 1.7 mm.

Head.— Antenna densely bristly setose, with 31 segments, third segment as long as fourth segment (fig. 47), length of third, fourth and penultimate segments 3.0, 3.0 and 1.1 times their width, respectively, subapical segments moniliform, petiolate (fig. 44); scapus distinctly punctate, long setose ventrally; length of maxillary palp 1.2 times height of head; OOL:diameter of posterior ocellus:POL = 9:4:11; distance between anterior and posterior ocelli 1.2 times diameter of ocellus (fig. 39); stemmaticum distinctly wider posteriorly than laterally (fig. 39); occipital carina complete, distinct and weakly arched medio-dorsally; frons shallowly concave medially and smooth anteriorly, laterally convex, punctulate and with medium-sized setae; length of eye in dorsal view 1.6 times temple; vertex convex, punctulate; temples directly narrowed behind eyes (fig. 39); face distinctly higher than clypeus, distance between tentorial pit and eye 1.3 times distance between pits (fig. 36), face densely setose and punctulate; clypeus distinctly convex, coarsely rugose, medio-ventrally without tooth (fig. 36); length of malar space 0.9 times basal width of mandible, striate ventrally; mandible rather slender, largely smooth except some dorsal rugae, only apically distinctly twisted; occipital flange medium-sized, somewhat protruding (fig. 36).

Mesosoma.— Length of mesosoma 1.4 times its height; pronope deep and small, because of large shiny convexity in front of it (fig. 41); side of pronotum smooth dorsally, crenulate medially and rugose ventrally (fig. 37); mesosternal suture deep and coarsely crenulate; epicnemial area densely rugulose dorsally and crenulate anteriorly; prepectal carina complete, rather weak ventrally; precoxal sulcus smooth, absent (except shallow depression posteriorly); remainder of mesopleuron smooth; mesopleural sulcus evenly and coarsely crenulate dorsally (more so than usually in other species); metapleuron largely coarsely reticulate-rugose (fig. 37); notauli complete, finely crenulate and rather narrow (fig. 41); mesoscutal lobes rather flat and largely smooth, densely setose; scutellar sulcus deep, wide and with one long carina and some rugosity; scutellum rather convex and smooth; surface of propodeum smooth anteriorly, remainder reticulate-rugose, its median carina rather weak and short, areola complete and moderately wide, anterior transverse carina weakly developed similar to other sculpture (fig. 41); propodeal tubercle medium-sized (fig. 37).

Wings.— Fore wing: distance from apex of marginal cell of fore wing to apex of wing 0.32 times vein 1-R1 (fig. 35); first discal cell distinctly truncate (fig. 35); r:3-SR+SR1:2-SR = 6:50:13; 1-SR+M nearly straight; SR1 evenly curved (fig. 35); cu-a oblique, not widened; 1-CU1:2-CU1 = 1:7; 1-CU1 slightly widened; m-cu distinctly antefurcal, straight and slightly converging to 1-M posteriorly; base of fore wing partly sparsely setose. Hind wing: 2-M slightly sinuate (fig. 35); 1-M about as long as 1r-

m; M+CU:1-M = 27:11; cu-a curved and distinctly inclivous; with 4 hamuli (most other species have 3 hamuli).

Legs.— Fore tibia without short spiny setae; hind coxa with some striae postero-dorsally and smooth antero-dorsally; tarsal claws rather robust, with distinct additional tooth, bristly setose (fig. 41); length of femur, tibia and basitarsus of hind leg 3.3, 7.2, and 5.2 times their width, respectively; outer face of hind femur coarsely punctate; hind tibia slightly narrowed apically, densely rugulose and setose; length of hind tibial spurs 0.35 and 0.40 times hind basitarsus.

Metasoma.— Length of first tergite 0.7 times its apical width, distinctly depressed and largely smooth medially, moderately rugose laterally (fig. 40), its dorsal carinae complete, dorsope absent, but somewhat developed because of high carinae; second tergite smooth, 1.1 times as long as third tergite (fig. 40); second suture distinct but narrow and rather shallow, smooth and somewhat curved medially; third tergite smooth, and comparatively transverse (as second tergite; fig. 40); length of ovipositor sheath 0.47 times fore wing, 1.5 times hind tibia, and 1.5 times length of three basal metasomal segments combined; hypopygium large, with narrow lamella posteriorly and apically truncate.

Colour.— Black (including middle and hind coxae and trochanters); antenna fuzzy brown basally, but scapus blackish-brown, contrasting with pedicellus; antenna medially and apically, pterostigma, veins (but SR1 pale brownish), part of metasoma ventrally, tegulae, fore coxa and telotarsi, dark brown; base of tibiae pale yellowish; remainder of legs and palpi fuzzy brown; wing membrane weakly infusate.

Variation.— Length of fore wing 3.2-3.7 mm, length of body 3.4-3.9 mm; length of ovipositor sheath 1.5-1.7 mm; antennal segments of ♀ 30(1), or 31(2), of ♂ 29(1), 30(1), or 31(3); length of first metasomal tergite 0.7-0.8 times its apical width; length of ovipositor sheath 0.41-0.47 times fore wing, and 1.4-1.5 times hind tibia; second tergite smooth or finely and narrowly rugulose anteriorly; pedicellus may be as dark brown as scapus; frequently veins of basal third of fore wing yellowish; hind femur, tibia and tarsus may be largely dark brown; female from Wester Ross has a comparatively small convexity in front of pronope (fig. 43) and vein SR1 of fore wing as dark brown as vein r.

Biology.— Reared from twigs of *Betula* species infested by *Magdalis carbonarius* (Linnaeus).

Distribution.— Scotland.

Notes.— Because of its colour, the reduced metasomal sculpture and the usually large convexity in front of the pronope, easy to recognize.

Eubazus (Allodorus) glabrichypealis spec. nov.
(figs 13-23)

Material.— Holotype, ♀ (RMNH), "Suisse: Vaud, Bonvillans, La Condre, 28.vi-10.vii.1991, J. Steffen", "Piège à cidre en sous-bois". Paratype: 1 ♀ (NMS), "France: Lot-et-Garonne, Bernac, 12.vi-14.vii. [19]97, Mal. tr., R.R. Askew".

Holotype, ♀, length of body 4.2 mm, of fore wing 3.5 mm, of ovipositor sheath 1.1 mm.

Head.— Antenna densely bristly setose, with 27 segments, third segment slightly

longer than fourth segment (fig. 23), length of third, fourth and penultimate segments 3.8, 3.6 and 1.5 times their width, respectively, subapical segments moniliform, petiolate (fig. 22); scapus only punctulate, long setose ventrally; length of maxillary palp 0.9 times height of head; OOL:diameter of posterior ocellus:POL = 8:4:9; distance between anterior and posterior ocelli 1.2 times diameter of ocellus (fig. 17); stemmaticum distinctly wider posteriorly than laterally (fig. 17); occipital carina complete, rather weak and slightly arched medio-dorsally; frons slightly concave and glabrous medially and largely smooth anteriorly (except for some short striae), laterally weakly convex, largely smooth and sparsely setose; length of eye in dorsal view 1.1 times temple; vertex convex, sparsely punctulate; temples smooth, directly narrowed behind eyes (fig. 17); face higher than clypeus, distance between tentorial pit and eye 0.9 times distance between pits (fig. 14), face moderately setose and largely smooth; clypeus rather flat, sparsely finely punctate, medio-ventrally with distinct tooth (fig. 14); length of malar space 1.5 times basal width of mandible; malar space and area near clypeus smooth or nearly so; mandible robust, finely striate, only apically twisted; occipital flange medium-sized, not protruding (fig. 14).

Mesosoma.— Length of mesosoma 1.4 times its height; pronope deep and large, subtriangular and area in front of it rather convex (fig. 19); side of pronotum smooth, but crenulate antero-medially and coarsely rugose ventrally (fig. 15); mesosternal suture deep and coarsely crenulate; epicnemial area largely smooth, anteriorly narrowly punctate-rugose; prepectal carina complete, rather weak; precoxal sulcus smooth, absent (except shallow depression); remainder of mesopleuron smooth; metapleuron largely coarsely reticulate-rugose (fig. 15); notauli complete, coarsely crenulate and rather narrow (fig. 19); mesoscutal lobes superficially punctulate, densely setose; scutellar sulcus deep, wide and with one long carina and remainder rugose; scutellum convex and punctulate; surface of propodeum smooth anteriorly, remainder punctate-rugose, its median carina strong, long (present behind transverse carina: fig. 19) and areola incomplete and wide, anterior transverse carina strongly developed (fig. 19); propodeal tubercle medium-sized (fig. 15).

Wings.— Fore wing: distance from apex of marginal cell of fore wing to apex of wing 0.27 times vein 1-R1 (fig. 13); first discal cell distinctly truncate (fig. 13); r:3-SR+SR1:2-SR = 7:48:17; 1-SR+M nearly straight; SR1 evenly curved (fig. 13); cu-a oblique, distinctly longer than 1-CU1; 1-CU1:2-CU1 = 3:16; 1-CU1 rather widened; m-cu distinctly antefurcal, straight and converging to 1-M posteriorly; base of fore wing partly sparsely setose. Hind wing: 2-M rather sinuate (fig. 13); 1-M distinctly longer than 1r-m (fig. 13); M+CU:1-M = 13:5; cu-a curved and subvertical.

Legs.— Fore tibia with numerous bristly setae, inconspicuous; hind coxa distinctly striate postero-dorsally and distinctly rugose antero-dorsally; tarsal claws rather robust, with small additional tooth, setose (fig. 20); hind femur coarsely punctate; length of femur, tibia and basitarsus of hind leg 3.4, 7.0, and 5.2 times their width, respectively; hind tibia somewhat narrowed apically and densely setose; length of hind tibial spurs 0.40 and 0.45 times hind basitarsus.

Metasoma.— Length of first tergite 0.8 times its apical width, flattened medio-posteriorly, its surface coarsely striate-rugose, but basally mainly rugose (fig. 18), its dorsal carinae nearly complete, dorsope absent, but somewhat developed because of high carinae basally; second tergite densely and rather coarsely longitudinally rugose, 1.15

times longer than third tergite (fig. 18); second suture distinct but rather shallow and largely smooth; third tergite smooth, except for some indistinct rugulosity antero-laterally (fig. 18); length of ovipositor sheath 0.32 times fore wing, 0.9 times hind tibia, and 0.6 times length of three basal metasomal segments combined; hypopygium rather large and apically truncate.

Colour.— Black (including base of hind coxa except apically); antenna (but first-third segments somewhat paler than other segments), pterostigma, veins (but basal half of hind wing, and of vein C mainly and vein 2A of fore wing yellowish), metasoma ventrally, fourth and following tergites, hind tibia (but base pale yellowish and ventrally narrowly yellowish-brown), telotarsi, and hind tarsus, dark brown; remainder of legs yellowish-brown; fore and middle tibia, palpi and tegulae pale brownish-yellow; remainder of fore and middle tarsi rather infusate; wing membrane slightly infusate.

Variation.— Length of fore wing 3.5-3.6 mm, length of body 3.6-4.2 mm; length of ovipositor sheath 1.0-1.1 mm; antennal segments of ♀ 26(1) or 27(1); length of first metasomal tergite 0.6-0.8 times its apical width; length of ovipositor sheath 0.28-0.32 times fore wing; length of eye in dorsal view 1.1-1.4 times temple; median length of third tergite 0.8-0.9 times second tergite; prepectal carina may be narrowly interrupted behind fore coxa.

Biology.— Unknown.

Distribution.— France; Switzerland.

Note.— Resembles the East Palaearctic *E. aliochinoi* Belokobylskij, 1998, but that species has no lateral crease of third metasomal tergite, the ovipositor sheath about 0.8 times fore wing and 1.9 times hind tibia, the scapus and pedicellus dark brown ventrally, the second tergite largely finely rugose, and the prepectal carina absent ventrally.

Eubazus (Allodorius) shishiniovae spec. nov.
(figs 1-12)

Aliolus semirugosus; Tobias, 1986: 166 (transl. 1995: 290); Belokobylskij, 1998: 465. See van Achterberg & Kenis, 2000: 448.

?*Allodorius semirugosus*; Papp, 1997: 106.

Material.— Holotype, ♀ (RMNH), "SW Bulgaria, Pastra, near Rila, (Mal. tr. 7), c 850 m, 11-31.v.1998, C. v. Achterberg, R. de Vries, P.V. Atanassova, RMNH, [19]98". Paratypes (18 ♀♀; RMNH; ZISP; NMS): 2 ♀♀, "NW Bulgaria, Zelin, near Botevgrad, (Mal. tr. 4), c 500 m, 9.vi-5.vii.1998, C. v. Achterberg, R. de Vries, P.V. Atanassova, RMNH, [19]98"; 3 ♀♀, "SE Bulgaria, Brodilovo, nr Ahtopol, (Mal. tr. 1 or 2), c 20 m, 7.v-8.vi.1998, C. v. Achterberg, R. de Vries, P.V. Atanassova, RMNH, [19]98"; 7 ♀♀, "NW Bulgaria, Opletnja, near Mazdra, (Mal. tr. 6), c 300 m, 11.vii-11.viii.1998 (but 1 ♀ 10.v-11.vi.1998), C. v. Achterberg, R. de Vries, P.V. Atanassova, RMNH, [19]98"; 3 ♀♀, "W Bulgaria, Sofia, Univ. Exp. Farm, (Mal. tr. 8), c 600 m, 25.vi-10.vii.1998 (1 ♀), 1-29.v.1997 (1 ♀), and 29.v-25.vi.1997 (1 ♀), P.V. Atanassova, RMNH, [19]98"; 1 ♀, "Bulgaria, ex coll. Zaykov, RMNH, Leiden, 1991". "R[h]odopi, Varbino, 30.iv.1977, A. Zaykov"; 1 ♀, "Bulgaria, ex coll. Zaykov, RMNH, Leiden, 1991". "Rhodopi, Velingrad, 5.viii.1979, A. Zaykov"; 1 ♀, "Bulgaria, ex coll. Zaykov, RMNH, Leiden, 1991". "Rhodopi, D. Lukovo, 29.iv.1977, J. Kolarov".

Holotype, ♀, length of body 3.7 mm, of fore wing 3.5 mm, of ovipositor sheath 1.3 mm.

Head.— Antenna densely bristly setose, with 29 segments, third segment slightly longer than fourth segment (fig. 12), length of third, fourth and penultimate segments 3.9, 3.8 and 1.5 times their width, respectively, subapical segments moniliform, petiolate (fig. 4); scapus only punctulate, long setose; length of maxillary palp 1.1 times height of head; OOL:diameter of posterior ocellus:POL = 21:10:18; distance between anterior and posterior ocelli 0.8 times diameter of ocellus (fig. 3); stemmaticum distinctly wider posteriorly than laterally (fig. 3); occipital carina complete, distinct and subhorizontal medio-dorsally; frons distinctly concave medially and rugose anteriorly, laterally convex, punctulate and with long setae; length of eye in dorsal view 1.5 times temple; vertex convex, punctulate; temples directly narrowed behind eyes (fig. 3); face distinctly higher than clypeus, distance between tentorial pit and eye equal to distance between pits (fig. 2), face densely setose and punctulate; clypeus rather flat, coarsely punctate, medio-ventrally with distinct tooth (fig. 2); length of malar space 1.2 times basal width of mandible; malar space and area near clypeus smooth or nearly so; mandible slender, striate, only apically twisted; occipital flange medium-sized, rather protruding (fig. 2).

Mesosoma.— Length of mesosoma 1.3 times its height; pronope deep, subtriangular and area in front of it slightly convex (fig. 8); side of pronotum smooth, but crenulate antero-medially and posteriorly (fig. 6); mesosternal suture deep and coarsely crenulate; epicnemial area with short rugae; prepectal carina complete, strong; precoxal sulcus smooth, absent (except for shallow depression); remainder of mesopleuron smooth; metapleuron largely coarsely reticulate-rugose (fig. 6); notauli complete, crenulate and rather narrow (fig. 7); mesoscutal lobes punctulate, densely setose; scutellar sulcus deep, wide and with one long and some shorter carinae; scutellum convex and smooth; surface of propodeum smooth anteriorly, remainder reticulate-rugose, its median carina strong, rather short and petiolate areola complete and narrow, anterior transverse carina strongly developed (figs 6, 7); propodeal tubercle medium-sized (fig. 6).

Wings.— Fore wing: distance from apex of marginal cell to apex of wing 0.25 times vein 1-R1 (fig. 1); first discal cell narrowly truncate (fig. 1); $r:3\text{-SR}+SR1:2\text{-SR} = 5:42:14$; 1-SR+M slightly sinuate; SR1 evenly curved (fig. 1); cu-a oblique; $1\text{-CU}1:2\text{-CU}1 = 4:11$, 1-CU1 slightly widened; m-cu distinctly antefurcal, straight and rather converging to 1-M posteriorly; base of fore wing densely setose. Hind wing: 2-M distinctly sinuate (fig. 1); 1-M about as long as 1r-m; $M+CU:1\text{-M} = 23:11$; cu-a curved and distinctly inclivous.

Legs.— Fore tibia with numerous short spiny setae; hind coxa distinctly striate postero-dorsally and with some rugae antero-dorsally; tarsal claws rather robust, with small tooth submedially, setose (fig. 9); hind femur largely smooth; length of femur, tibia and basitarsus of hind leg 3.6, 6.5, and 5.8 times their width, respectively; hind tibia distinctly narrowed apically and densely setose; length of hind tibial spurs 0.4 and 0.5 times hind basitarsus.

Metasoma.— Length of first tergite 0.7 times its apical width, depressed medio-posteriorly, its surface coarsely striate-rugose, but basally mainly (rugose-)punctate, its dorsal carinae complete, dorsope absent, but somewhat developed because of high carinae; second tergite coarsely striate-rugose, about as long as third tergite (figs 6, 11); second suture distinct but rather shallow and finely crenulate; second and base of

third tergite with lateral crease; third tergite densely and more finely striate-rugose and near posterior rim smooth; fourth-seventh tergites largely retracted (fig.); length of ovipositor sheath 0.39 times fore wing, 1.1 times hind tibia, and 0.8 times length of three basal metasomal segments combined; hypopygium rather large and apically truncate.

Colour.— Black (including base of hind coxa narrowly); antenna (but scapus and pedicellus ventrally yellowish), pterostigma, veins (but basal half of hind wing, base of M+CU1, C mainly and 2A of fore wing yellowish), metasoma ventrally, fourth and following tergites, tegulae, hind tibia (but base pale yellowish and apically narrowly yellowish-brown), telotarsi, and hind tarsus, dark brown; remainder of legs brownish-yellow, but trochanters and trochantelli pale yellowish; palpi pale yellowish or whitish; wing membrane subhyaline.

Variation.— Length of fore wing 2.3-3.5 mm, length of body 2.4-3.7 mm; length of ovipositor sheath (0.8-)1.0-1.3(-1.6) mm; antennal segments of ♀ 25(3), 26(2), 27(3), 28(4), 29(1) or 30(1); length of first metasomal tergite 0.6-0.8 times its apical width; length of ovipositor sheath (0.29-)0.39-0.50 times fore wing, and 1.0-1.2(-1.5) times hind tibia; tarsal claws with distinct tooth, but in two paratypes from Brodilovo obsolescent; apical half of third tergite usually largely sculptured but sometimes smooth; clypeus coarsely to finely punctate and largely smooth; tegulae dark brown to brownish-yellow; third-fourth or third-sixth antennal segments brown or dark brown; hind tibia at least partly dark brown ventrally; vein 2-R1 of fore wing medium-sized to long; hind tibia and tarsus may be largely fuzzy brown; clypeal tooth may be small and rather obtuse.

Biology.— Unknown.

Distribution.— Bulgaria; according to Tobias (1986) and Belokobylskij (1998) also Russia (including Caucasus and Far East Russia), and according to Papp (1997) Hungary.

Etymology.— Named after Prof. Dr Maria Shishiniova (University of Sofia), for her assistance during the fieldwork in Bulgaria and for her hospitality during my stay at the University of Sofia.

Notes.— If the third metasomal tergite is sculptured and distinctly shorter than the second tergite, the scapus black and the mesoscutum sculptured, cf. the subgenus *Aliolus* Say, 1836. The new species resembles the East European *Eubazus* (*Allodorus*) *denticlypealis* (Tobias, 1986) **comb. nov.** However, this species does not belong to the *E. aliochinoi*-group; it has vein r of fore wing very short, the tarsal claws not angulately protruding medio-ventrally, the propodeum superficially rugose, and the second metasomal suture shallow. If the third tergite and the second metasomal suture are completely smooth, and the prepectal carina is completely absent ventrally, cf. the East Palaearctic *E. aliochinoi* Belokobylskij, 1998.

In recent literature (e.g. Belokobylskij, 1998) this species is named *E. semirugosus* Nees, but this species has the tarsal claws simple, the ovipositor sheath longer, and the frons and the third metasomal tergite less sculptured (van Achterberg & Kenis, 2000).

Eubazus (*Allodorus*) *tricoloripes* spec. nov.
(figs 48-58)

Material.— Holotype, ♀ (RMNH), "Nederland, Hulshorst (Gld.), 20-22.vi.1975, Malaise trap, J. v. d.

Vecht". Paratypes (6 ♀♀): 3 ♀♀ (RMNH), "Nederland, Wijster (Dr), opposite Biol. Stat., 9-16.vi.1978 (1♀), 2-9.vii.1976 (1♀) and 1-14.vii.1972 (1♀), C. v. Achterberg"; 3 ♀♀ (NMS, RMNH), "[England], Windsor Forest, Berks., SU 945 705, Mal. tr., 1-26.vi.[19]92, NMSZ 1997.147".

Holotype, ♀, length of body 2.9 mm, of fore wing 2.8 mm, of ovipositor sheath 0.8 mm.

Head.— Antenna densely bristly setose, with 27 segments, third segment slightly longer than fourth segment (fig. 58), length of third, fourth and penultimate segments 3.2, 3.0 and 1.1 times their width, respectively, subapical segments submoniliform, indistinctly petiolate (fig. 54); scapus only punctulate, long setose ventrally; length of maxillary palp 1.1 times height of head; OOL:diameter of posterior ocellus:POL = 18:8:15; distance between anterior and posterior ocelli about equal to diameter of ocellus (fig. 50); stemmaticum distinctly wider posteriorly than laterally (fig. 50); occipital carina complete, weakly developed and weakly arched medio-dorsally; frons shallowly concave medially and smooth anteriorly, laterally narrowly convex, punctulate and with medium-sized setae; length of eye in dorsal view 1.3 times temple; vertex convex, punctulate; temples slightly narrowed behind eyes (fig. 50), distinctly punctulate; face distinctly higher than clypeus, distance between tentorial pit and eye 1.2 times distance between pits (fig. 49), face densely setose and punctulate, with some striae near antennal sockets; clypeus distinctly convex, coarsely rugose, medio-ventrally without tooth (fig. 49); length of malar space 0.8 times basal width of mandible; mandible rather slender, coarsely sculptured, only apically twisted; occipital flange medium-sized, not distinctly protruding.

Mesosoma.— Length of mesosoma 1.2 times its height; pronope deep, subtriangular and area in front of it weakly convex (fig. 55); side of pronotum smooth dorsally, but crenulate medially and posteriorly, and punctate-rugose ventrally (fig. 52); mesosternal suture deep and coarsely crenulate; epicnemial area with short rugae; prepectal carina complete, weakly developed; precoxal sulcus punctate-rugose (fig. 52); mesopleuron above precoxal sulcus (except speculum) punctate, below precoxal sulcus smooth; metapleuron largely coarsely reticulate-rugose (fig. 52); notauli complete, crenulate and rather narrow (fig. 55); mesoscutal lobes distinctly punctulate, densely setose; scutellar sulcus deep, wide and with one long and some shorter carinae; scutellum convex and smooth; surface of propodeum smooth anteriorly, remainder coarsely reticulate-rugose, its median carina strong, medium-sized and areola strong, complete and medium-sized, anterior transverse carina strongly developed (fig. 55); propodeal tubercle minute (fig. 52).

Wings.— Fore wing: distance from apex of marginal cell of fore wing to apex of wing 0.28 times vein 1-R1 (fig. 48); first discal cell narrowly truncate; r:3-SR+SR1:2-SR = 11:84:29; 1-SR+M nearly straight; SR1 evenly curved (fig. 48); cu-a oblique; 1-CU1:2-CU1 = 5:17, 1-CU1 slightly widened; m-cu distinctly antefurcal, straight and rather converging to 1-M posteriorly; base of fore wing densely setose. Hind wing: 2-M nearly straight (fig. 48); 1-M somewhat shorter than 1r-m; M+CU:1-M = 23:81; cu-a largely straight posteriorly and rather inclivous.

Legs.— Fore tibia with numerous short spiny setae; hind coxa with some oblique striae postero-dorsally and with some rugae antero-dorsally; tarsal claws rather robust, with distinct additional tooth, setose (fig. 57); hind femur largely smooth;

length of femur, tibia and basitarsus of hind leg 3.6, 6.7, and 5.2 times their width, respectively; hind tibia distinctly narrowed apically and densely setose; length of hind tibial spurs 0.40 and 0.45 times hind basitarsus.

Metasoma.— Length of first tergite 0.7 times its apical width, somewhat depressed and transversely rugose medio-posteriorly, its surface rather finely and irregularly rugose (fig. 53), its dorsal carinae complete, dorsope absent, but somewhat developed because of high carinae; second tergite partly smooth and partly finely punctate-rugose (fig. 53), slightly longer than third tergite (fig. 52); second tergite without distinct lateral crease; second suture distinct and finely crenulate, obsolescent and smooth laterally; third tergite completely smooth, comparatively transverse and its posterior margin subtruncate; fourth-seventh tergites rather exposed (fig. 52); length of ovipositor sheath 0.27 times fore wing, 0.8 times hind tibia, and 0.8 times length of three basal metasomal segments combined; hypopygium large and apically truncate.

Colour.— Black; second-fourth segments of antenna yellowish, but fourth segment darkened apically; remainder of antenna, pterostigma, veins (but base of M+CU1, C+SC mainly and 2A of fore wing and veins of hind wing yellowish), metasoma laterally and ventrally, fourth and following tergites, tegulae, hind tibia (but base pale yellowish and ventrally brownish-yellow), telotarsi, and hind tarsus, dark brown; remainder of legs brownish-yellow, but middle and hind coxa largely brown; palpi pale yellowish; wing membrane slightly infuscate; laterally pterostigma slightly paler brown than medially; dark brown scapus contrasting with yellowish pedicellus.

Variation.— Length of fore wing 2.4-3.0 mm, length of body 2.3-3.1 mm; length of ovipositor sheath 0.7-0.8 mm; antennal segments of ♀ 25(1), 27(1), or 28(3); length of first metasomal tergite 0.7-0.8 times its apical width, surface finely to coarsely rugose; length of ovipositor sheath 0.24-0.30 times fore wing, and 0.7-0.9 times hind tibia; prepectal carina may be reduced ventro-laterally; second metasomal suture sometimes smooth medially; only second or second-sixth antennal segments may be largely yellowish; apical antennal segment may be brown, paler than penultimate segments.

Biology.— Unknown.

Distribution.— England; Netherlands.

Notes.— If the first metasomal tergite is immovably joined to the second tergite, but separated by deep suture, cf. the genus *Triaspis* Haliday, 1835.

The new species disagrees with the enigmatic *Eubazus punctatus* (Ratzeburg, 1852), because it has the hind tibia and part of the base of the antenna (viz. scapus) dark brown. The holotype of *E. punctatus* is lost and its recognition is problematic; it may be an aberrant specimen of *E. rugosus* (Ratzeburg, 1848).

Also near the East Palaearctic *E. sibiricus* Belokobylskij, 1998, but this is a less robust species, which has simple tarsal claws, the fore tibia without distinct spiny bristles, the hind tibia more slender, dorsally hardly darker than ventrally, and the third tergite with some weak sculpture basally. If the third tergite is completely (rugose-)punctate and more elongate, its posterior margin distinctly curved and in lateral view convex, and the transverse carina of propodeum is weakly developed, cf. the East Palaearctic *E. santacheza* Belokobylskij, 1998, of which only the male is known.

In existing keys this species may key out as *E. corrugatus* (Ruthe, 1867), but that species is a junior synonym of *E. rugosus* (Ratzeburg, 1848) **syn. nov.**, having simple tarsal claws and a different colouration.

Eubazus (Alldorus) zelinensis spec. nov.
(figs 24-34)

Material.— Holotype, ♀ (RMNH), “NW Bulgaria, Zelin, near Botevgrad, (Mal. tr. 4), c 500 m, 9.vi.5.vii.1998, C. v. Achterberg, R. de Vries, P.V. Atanassova, RMNH, [19]98”.

Holotype, ♀, length of body 3.7 mm, of fore wing 3.3 mm, of ovipositor sheath 1.3 mm.

Head.— Antenna densely bristly setose, with 29 (right) or 30 (left) segments, third segment 1.1 times longer than fourth segment (fig. 33), length of third, fourth and penultimate segments 3.4, 3.0 and 1.1 times their width, respectively, subapical segments comparatively slender, submoniliform, petiolate (fig. 34); scapus only punctulate, long setose; length of maxillary palp 0.9 times height of head; OOL:diameter of posterior ocellus:POL = 9:4:8; distance between anterior and posterior ocelli about equal to diameter of ocellus (fig. 26); stemmaticum distinctly wider posteriorly than laterally (fig. 26); occipital carina complete, distinct and subhorizontal medio-dorsally; frons weakly concave medially and largely smooth anteriorly, laterally convex, punctulate and with long setae; length of eye in dorsal view 0.9 times temple; vertex convex, punctulate; temples subparallel behind eyes, narrowed posteriorly (fig. 26); face distinctly higher than clypeus, distance between tentorial pit and eye 0.7 times distance between pits (fig. 25), face densely setose and punctate; clypeus convex, coarsely rugose, medio-ventrally with small tooth (fig. 25); length of malar space equal to basal width of mandible, area (rugose-)striate ventrally (fig. 28); mandible slender, rugose, only apically twisted; occipital flange medium-sized, not protruding (fig. 25).

Mesosoma.— Length of mesosoma 1.3 times its height; pronope deep, subtriangular and area in front of it nearly flat (fig. 29); side of pronotum largely smooth, but crenulate antero-medially and posteriorly, and rugulose ventrally (fig. 28); mesosternal suture deep and coarsely crenulate; epicnemial area with short rugae; prepectal carina complete, weak ventrally; precoxal sulcus smooth, absent (except for shallow depression); mesopleuron above precoxal sulcus sparsely punctate, remainder smooth; metapleuron largely coarsely reticulate-rugose (fig. 28); notauli complete, crenulate and rather narrow (fig. 29); mesoscutal lobes punctulate, densely setose; scutellar sulcus deep, wide and with one long carina; scutellum rather flat and largely smooth; surface of propodeum partly smooth and partly coarsely punctate anteriorly, remainder partly smooth, with some coarse punctures, its median carina strong, rather short and areola incomplete and narrow, anterior transverse carina coarse, protruding (fig. 28); propodeal tubercle medium-sized (fig. 28).

Wings.— Fore wing: distance from apex of marginal cell of fore wing to apex of wing 0.39 times vein 1-R1 (fig. 24); first discal cell rather narrowly truncate; r:3-SR+SR1:2-SR = 15:88:24; 1-SR+M slightly sinuate; SR1 nearly straight (fig. 24); cu-a oblique and slightly widened posteriorly (fig. 24); 1-CU1:2-CU1 = 3:16; 1-CU1 slightly widened and oblique; m-cu distinctly antefurcal, straight and converging to 1-M pos-

teriorly; base of fore wing partly sparsely setose. Hind wing: 2-M weakly sinuate (fig. 24); 1-M slightly shorter than 1r-m; M+CU:1-M = 8:3; cu-a straight and distinctly inclivous.

Legs.— Fore and middle tibiae with numerous peg-like spines; hind coxa striate postero-dorsally and with some weak rugae antero-dorsally; tarsal claws rather robust, with small additional tooth, bristly setose (fig. 32); hind femur partly coarsely punctate-reticulate; length of femur, tibia and basitarsus of hind leg 3.6, 7.4, and 6.4 times their width, respectively; hind tibia distinctly narrowed apically and densely setose; length of hind tibial spurs 0.40 and 0.45 times hind basitarsus.

Metasoma.— Length of first tergite 0.7 times its apical width, slightly depressed medio-posteriorly, its surface coarsely rugose-striate, but basally mainly rugose (fig. 30), its dorsal carinae complete, dorsope absent; second tergite largely smooth and densely setose, with some punctures and weak rugulae, without lateral crease, and about as long as third tergite (fig. 28); second suture indistinct, smooth; third tergite smooth, and setae in one row; fourth-seventh tergites exposed; length of ovipositor sheath 0.39 times fore wing, 1.2 times hind tibia, and 1.2 times length of three basal metasomal segments combined; hypopygium rather large and apically truncate.

Colour.— Black; antenna (but scapus and pedicellus laterally and ventrally yellowish), pterostigma, veins (but basal half of hind wing, base of M+CU1, C basally and 2A of fore wing yellowish), metasoma (except first tergite), hind tibia dorsally (but base pale yellowish and apically narrowly yellowish-brown), telotarsi, and hind tarsus, dark brown; trochanters, trochantelli, palpi and tegulae pale yellowish; remainder of legs brownish-yellow; wing membrane subhyaline.

Biology.— Unknown.

Distribution.— Bulgaria.

Notes.— Superficially resembling *E. shishiniovae*, but easily separable by the less sculptured metasoma, the longer temples, the convex clypeus and the comparatively long vein r of fore wing.

Eubazus (Aliolus) regularis nom. nov.

Aliolus rufithorax Tobias, 1986: 166 (transl. 1995: 290) [examined]. Not: *Calyptus rufithorax* Abdinbekova, 1969: 64-65; 1975: 142-143 [examined].

Abdinbekova (1969) described *Calyptus rufithorax* from Azerbaidzhan, which correctly was included in the genus *Eubazus* Nees by Tobias (1986). In the same paper Tobias described *Aliolus rufithorax* from Caucasus which should be included in the genus *Eubazus* where it becomes a junior secondary homonym. The genus *Aliolus* Say, 1836, is considered to be a subgenus of the genus *Eubazus* Nees, because of the lack of well-discriminating characters (van Achterberg, 1990a; van Achterberg & Kenis, 2000). The secondary homonym is here renamed as *Eubazus regularis* **nom. nov.**, because of its regularly striate third metasomal tergite.

Acknowledgements and abbreviations

I wish to express my gratitude to Dr S.A. Belokobylskij (St. Petersburg) for the loan of many types, Dr M.R. Shaw (Edinburgh) for his valuable remarks on an earlier

version of this paper and for the opportunity to examine his important collection of Brachistini, Dr P.V. Atanassova (= P.V. Ivanova, Helmond), R. de Vries (Leiden), Prof. Dr M. Shishiniova (Sofia), and E. Nenova (Sofia) for their help during my fieldwork in Bulgaria, and to Dr J. Hamon (Gaillard) for the gift of specimens.

The following abbreviations are used for the depositories: NMS = National Museums of Scotland, Edinburgh; RMNH = Nationaal Natuurhistorisch Museum, Leiden; ZISP = Zoological Institute, St. Petersburg.

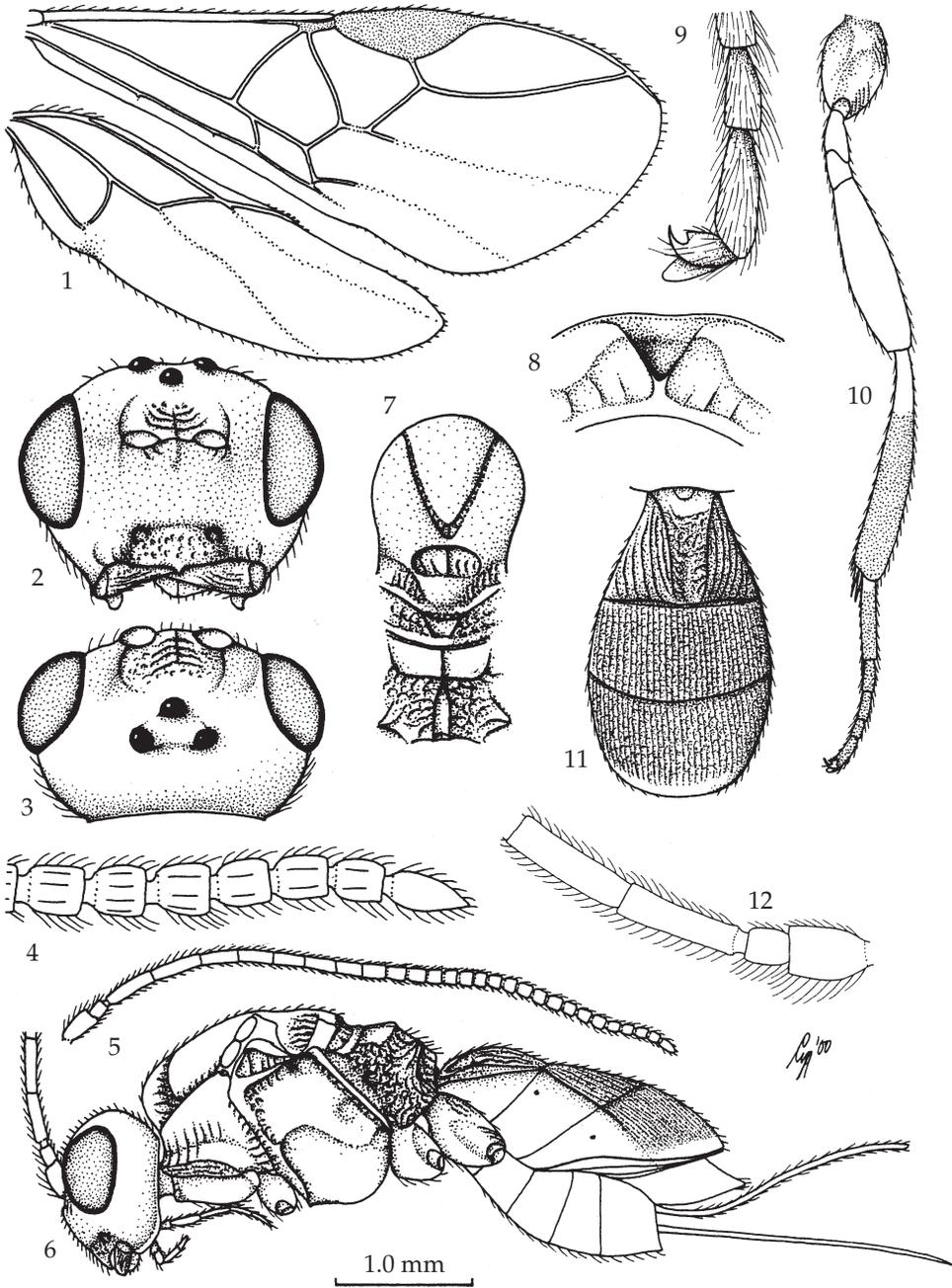
References

- Abdinbekova, A.A., 1969. Brakonidy (Hymenoptera, Braconidae) rajonov Malogo Kavkaza v Azerbaidzhane.— Izv. Akad. Nauk. azerb. SSR, ser. biol. nauk 5: 69-76.
- Abdinbekova, A.A., 1975. Braconidy (Hymenoptera, Braconidae) Azerbaidzhana, 1-323, figs 1-124.— Baku.
- Achterberg, C. van, 1988. Revision of the subfamily Blacinae Foerster (Hymenoptera, Braconidae).— Zool. Verh. Leiden 249: 1-324, figs 1-1250.
- Achterberg, C. van, 1990a. Revision of the genera *Foersteria* Szépligeti and *Polydegmon* Foerster (Hymenoptera: Braconidae) with the description of a new genus.— Zool. Verh. Leiden 257: 1-32, figs 1-118.
- Achterberg, C. van, 1990b. Illustrated key to the subfamilies of the Holarctic Braconidae (Hymenoptera: Ichneumonoidea).— Zool. Med. Leiden 64: 1-20, figs 1-26.
- Achterberg, C. van, 1993. Illustrated key to the subfamilies of the Braconidae (Hymenoptera: Ichneumonoidea).— Zool. Verh. 283: 1-189, figs 1-66, photos 1-140, plates 1-102.
- Achterberg, C. van, 1997. Braconidae. An illustrated key to all subfamilies.— ETI World Biodiversity Database CR-ROM Series.
- Achterberg, C. van & M. Kenis, 2000. The Holarctic species of the subgenus *Allodorus* Foerster s.s. of the genus *Eubazus* Nees (Hymenoptera: Braconidae).— Zool. Med. Leiden 73: 427-455, figs 1-41.
- Alauzet, C., 1987. Bioecologie de *Eubazus semirugosus*, *Coeloides abdominalis* et *C. sordidator* (Hym.: Braconidae) parasites de *Pissodes notatus* (Col.: Curculionidae) dans le sud de la France.— Entomophaga 32: 39-47.
- Belokobylskij, S.A., 1998. 12. Podsem. Brachistinae (Calyptinae): 440-489. In: P.A. Ler (ed.). Opređelitel nasekomych dalnego vostoka Rossii (4)3: 1-708.— Vladivostok.
- Foerster, A., 1862. Synopsis der Familien und Gattungen der Braconen.— Verh. naturh. Ver. preus. Rheinl. 19: 225-288.
- Haeselbarth, E., 1962. On the bionomics, life history and ecology of *Brachistes atricornis* Ratz. (Hym., Braconidae) as a parasite of *Pissodes piceae* (Ill.) (Col., Curculionidae).— Z. ang. Ent. 49: 233-289.
- Nees von Esenbeck, C.G., 1814. Ichneumonides adsciti, in genera et familias divisi.— Mag. Ges. Naturf. Fr. Berlin 6 [1812]: 183-221.
- Papp, J., 1997. Contribution to the braconid fauna of Hungary, XII. Calyptinae.— 1. (Hymenoptera: Braconidae).— Folia ent. Hung. 58: 105-113.
- Shenefelt, R.D., 1970. Braconidae, 2.— Hym. Cat. (nov. ed.) 5: 177-306.
- Tobias, V.I., 1986. Brachistinae (Calyptinae): 158-180. In: Medvedev, G.S. (ed.). Opređelitel nasekomych Evropeiskoi tchasti SSSR 3, Perepontchatokrylye 4.— Opr. Faune SSSR 145: 1-501, figs 1-263. Translation 1995: 273-316.— Lebanon, U.S.A.

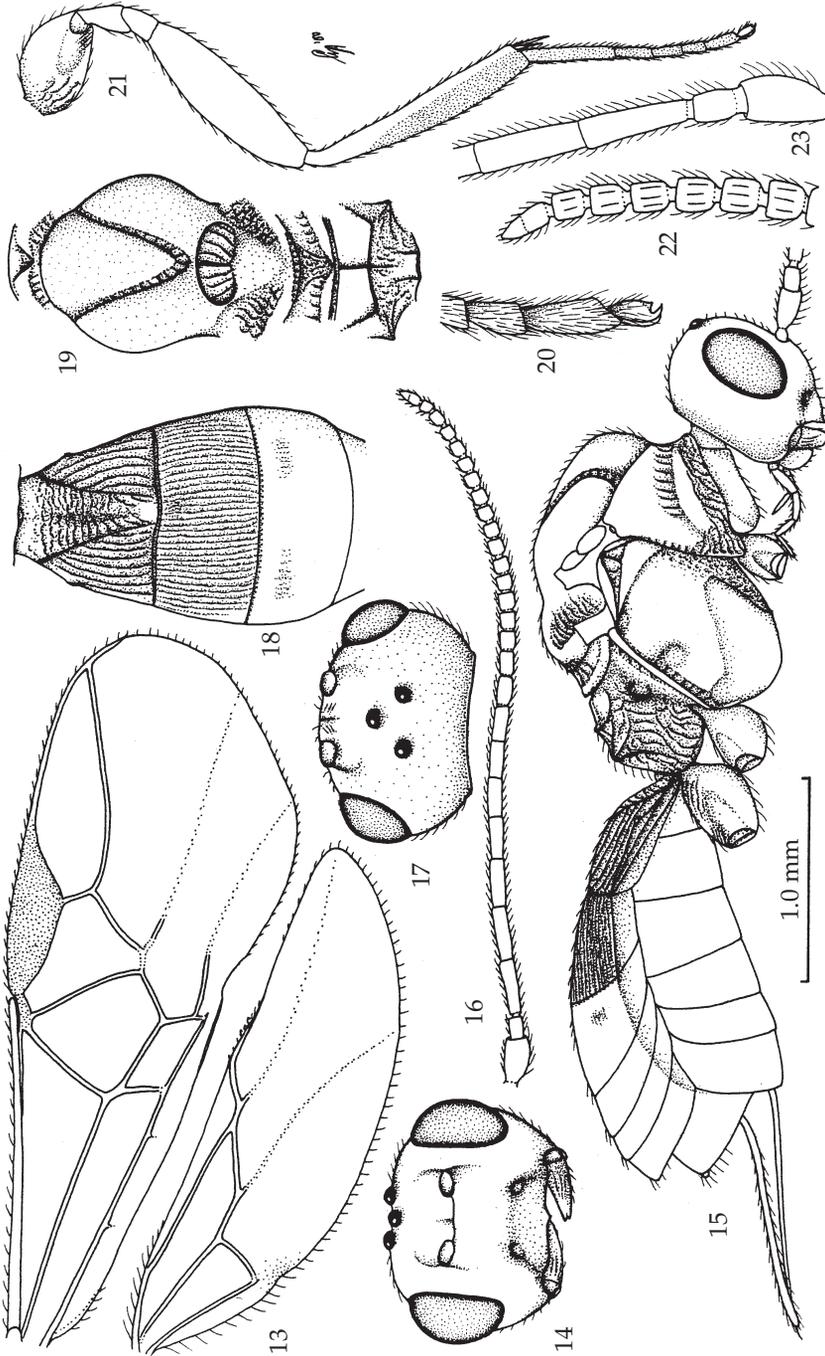
Received: 7.viii.2000

Accepted: 30.viii.2000

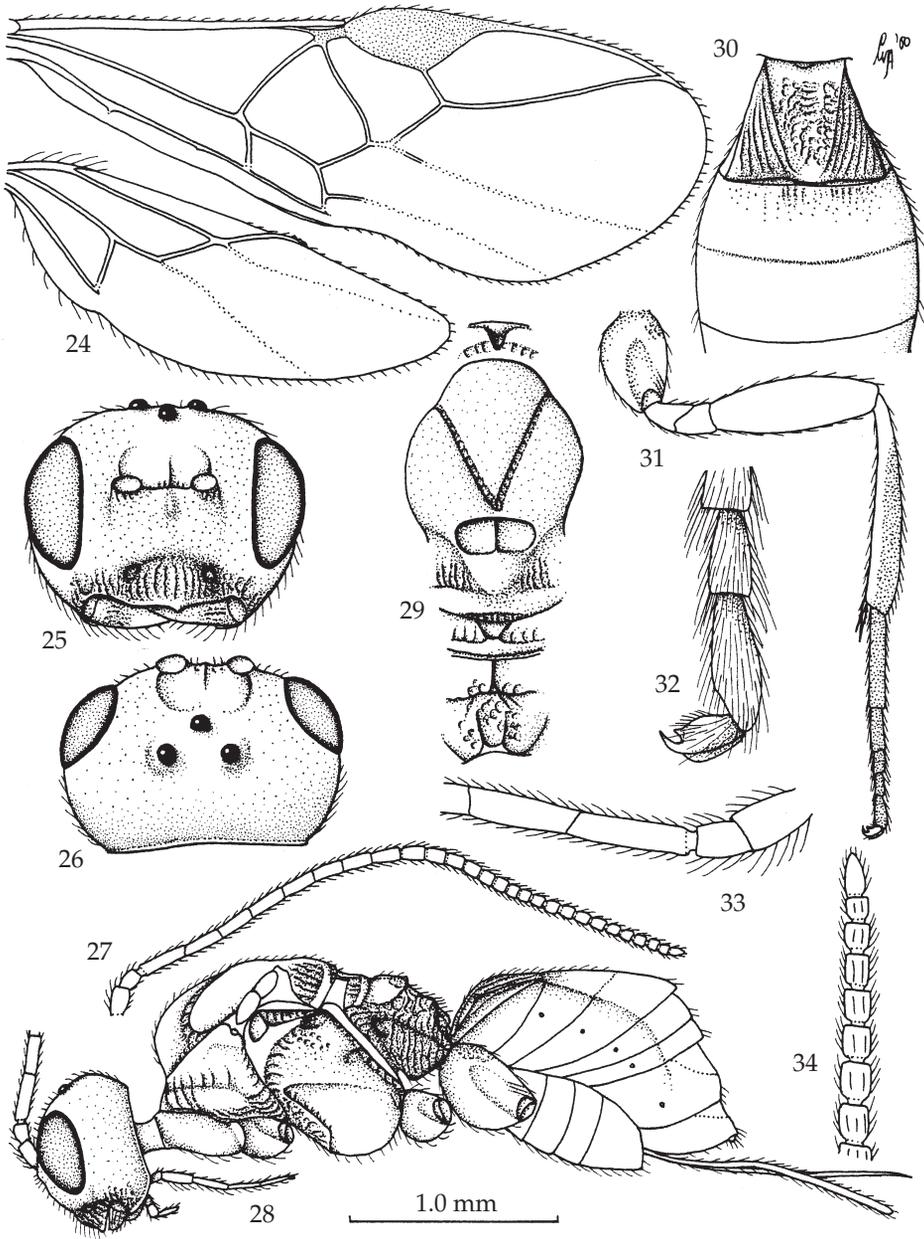
Edited: R. de Jong



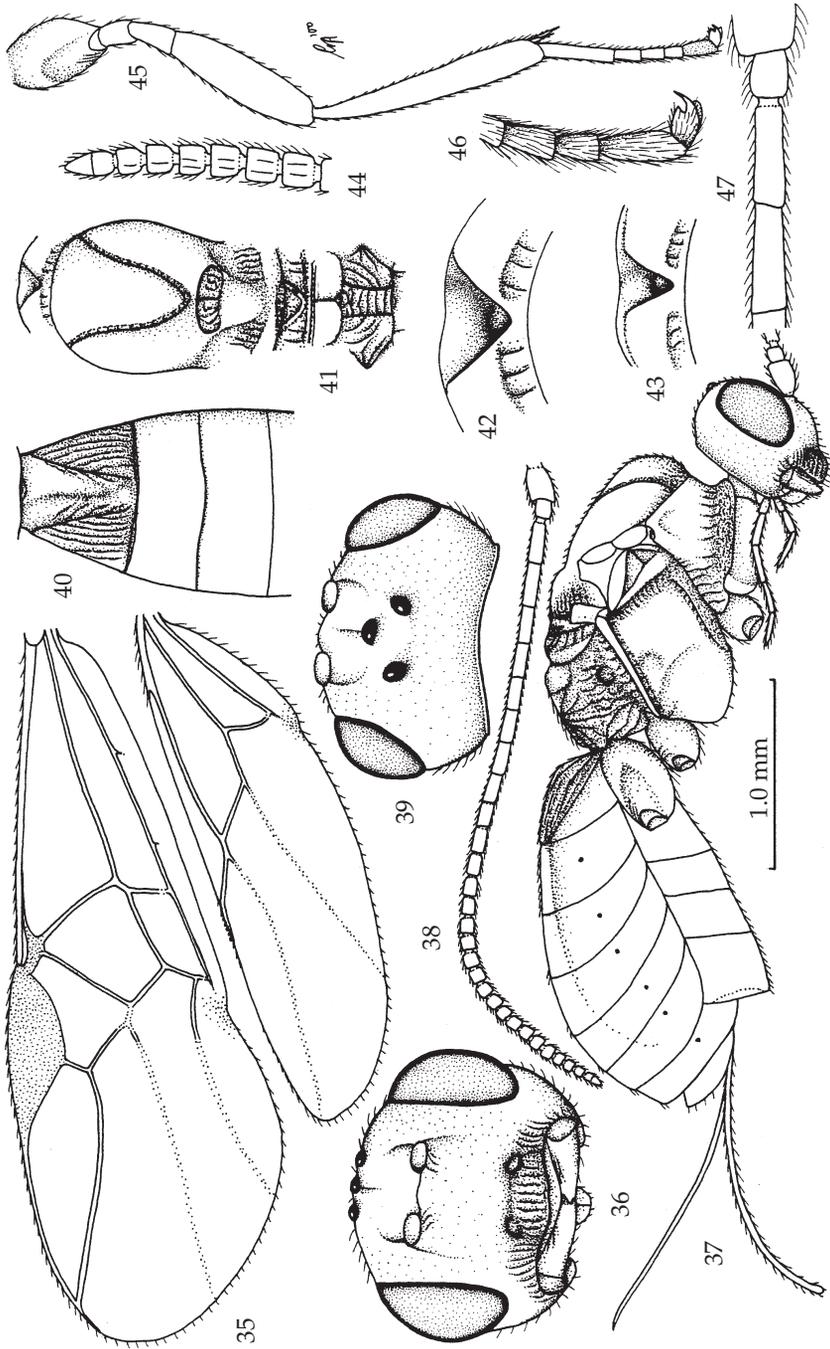
Figs 1-12, *Eubazus shishiniovae* spec. nov., ♀, holotype, but 8 of paratype. 1, wings; 2, head, frontal aspect; 3, head, dorsal aspect; 4, apex of antenna; 5, antenna; 6, habitus, lateral aspect; 7, mesosoma, dorsal aspect; 8, pronope, dorsal aspect; 9, inner hind claw; 10, hind leg; 11, metasoma, dorsal aspect; 12, base of antenna. 1, 5-7, 10, 11: scale-line (= 1.0 ×); 2, 3: 2.2 ×; 4, 8, 9: 5.2 ×; 12: 3.1 ×.



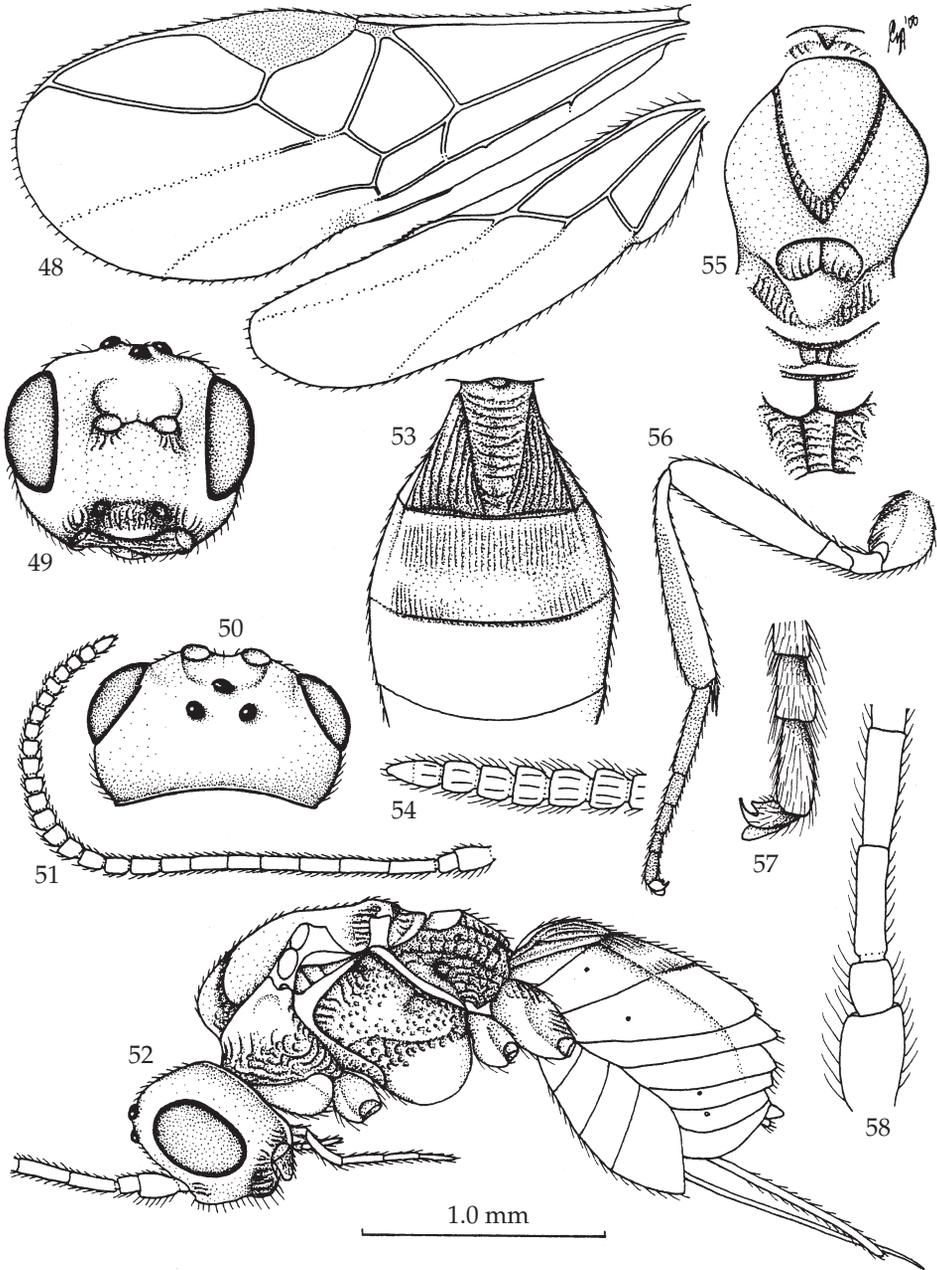
Figs 13-23, *Eubazus glabrichlypealis* spec. nov., ♀, holotype. 13, wings; 14, head, frontal aspect; 15, habitus, lateral aspect; 16, antenna; 17, head, dorsal aspect; 18, first-third metasomal tergites, dorsal aspect; 19, mesosoma, dorsal aspect; 20, inner hind leg; 21, inner hind claw; 22, apex of antenna; 23, base of antenna. 13, 15, 16, 18, 19, 21: scale-line (= 1.0 ×); 14, 17: 1.1 ×; 20, 22: 2.5 ×; 23: 2.0 ×.



Figs 24-34, *Eubazus zelinensis* spec. nov., ♀, holotype. 24, wings; 25, head, frontal aspect; 26, head, dorsal aspect; 27, antenna; 28, habitus, lateral aspect; 29, mesosoma, dorsal aspect; 30, first-third metasomal tergites, dorsal aspect; 31, hind leg; 32, outer hind claw; 33, base of antenna; 34, apex of antenna. 24, 27, 28, 31: scale-line (= 1.0 x); 25, 26: 1.5 x; 29, 30: 1.1 x; 32: 3.4 x; 33, 34: 2.0 x.



Figs 35-47, *Eubazus corruxope* spec. nov., ♀, holotype from Wester Ross. 35, wings; 36, head, frontal aspect; 37, habitus, lateral aspect; 38, antenna; 39, head, dorsal aspect; 40, first-third metasomal tergites, dorsal aspect; 41, mesosoma, dorsal aspect; 42, 43, pronope, dorsal aspect; 44, apex of antenna; 45, hind leg; 46, inner hind claw; 47, base of antenna. 35, 37, 38, 40, 41, 45: scale-line (= 1.0 x); 36, 39: 1.6 x; 42, 2.9 x; 43, 44, 46, 47: 2.5 x.



Figs 48-58, *Eubazus tricoloripes* spec. nov., ♀, holotype. 48, wings; 49, head, frontal aspect; 50, head, dorsal aspect; 51, antenna; 52, habitus, lateral aspect; 53, first-third metasomal tergites, dorsal aspect; 54, apex of antenna; 55, mesosoma, dorsal aspect; 56, hind leg; 57, inner hind claw; 58, base of antenna. 48, 51, 52, 56: scale-line (= 1.0 mm); 49, 50, 53, 55: 1.6 x; 54, 58: 2.5 x; 57: 3.0 x.

