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REVISIONARY NOTES ON THE PALAEARCTIC GENERA AND SPECIES OF THE TRIBE EXOTHECINI FOERSTER (HYMENOPTERA, BRACONIDAE)

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With 34 text-figures

ABSTRACT

The tribe Exothecini Foerster sensu stricto (Braconidae, Rogadinae) is defined, and keys are given to the Palaearctic genera, the N.W. European species of *Shawiana* gen. nov. and the Palaearctic species of *Xenarcha* Foerster. *Shawiana* gen. nov. (type-species: *Exothecus laevis* Thomson, 1892) is described. Lectotypes are designated for *Rogas catenator* Haliday, 1836, *R. fragilis* Haliday, 1836, and *Exothecus laevis* Thomson, 1892. New synonyms are *Bracon dimidiatus* Nees, 1834 (nec Spinola, 1808) and *Phanomeris thomsoni* Szépligeti, 1906, of *Xenarcha lustrator* (Haliday, 1836) and *Exothecus glabricollis* Thomson, 1892, of *Xenarcha abnormis* (Wesmael, 1838). New combinations are: *Colastes fragilis* (Haliday, 1836), *Shawiana catenator* (Haliday, 1836), *S. phyllotomae* (Muesebeck, 1932), *S. lapponica* (Thomson, 1892), *S. metalli* (Muesebeck, 1932), *S. foveolator* (Thomson, 1892), *S. laevis* (Thomson, 1892), *Xenarcha laticarpus* (Thomson, 1892), *X. abnormis* (Wesmael, 1838), and *X. effecta* (Papp, 1972).

INTRODUCTION

Ecological work done by Dr. M.R. Shaw (Edinburgh) and difficulties encountered with the identification of Dutch species were reasons to revise the genera of the Exothecini and to construct keys based on the type-material of Haliday, Thomson, and Wesmael. The tribe Exothecini of the Braconidae-Rogadinae is treated here in a restricted sense, viz., containing only the genera with the prepectal carina completely absent. In this sense the genera of Exothecini are a homogenous group, with exception of the rather aberrant Nearctic genus *Xenosternum* Muesebeck; all are ectoparasites of mining larvae of holometabolous insects. The only genus examined of the Exothecini not

known from the Palaearctic region is *Xenosternum* Muesebeck, 1935 (type-species, and only known species: *X. ornigis* Muesebeck, 1935), a parasite of Gracillariidae and Gelechiidae. It differs by the coriaceous mesoscutum and the absence of vein CU1b of the fore wing. For technical terms used, see Van Achterberg, 1979: 242–249. The species with an asterisk are new to the fauna of the Netherlands.

Exothecini Foerster, sensu stricto

Diagnosis. — Occipital carina remaining separated from hypostomal carina or absent ventrally, and widely interrupted dorsally (but present dorsally in *Xenosternum*); pronope large (fig. 15) or absent; prepectal carina absent; vein M+CU of hind wing shorter than vein 1-M (fig. 12) or subequal (*Xenosternum*); pterostigma of male sometimes enlarged in respect to pterostigma of female; dorsope distinct (fig. 9) or obsolescent (*Xenosternum*); laterope absent; nota of 2nd and 3rd metasomal tergites similarly sclerotized as their epipleura; ovipositor sheath shorter than length of metasoma. Solitary ectoparasites of mining larvae of Lepidoptera (*Colastes*, *Xenosternum*), Diptera (*Colastes*), Hymenoptera (*Xenarcha*, *Shawiana*), and Coleoptera (*Colastes*, *Shawiana*); host feeding is frequent; pupation in host mine (Shaw, 1983).

Distribution: Holarctic region: *Colastes* Haliday, 1833; *Xenarcha* Foerster, 1862; *Shawiana* gen. nov. Nearctic region: *Xenosternum* Muesebeck, 1935.

Key to the Palaearctic genera of Exothecini

1. Pronope usually large and deep (figs. 8, 15, 28); if shallow, then ambiguous because of a smooth and wide transverse depression; position of vein r variable (figs. 4, 21, 32); pterostigma of male sometimes enlarged (fig. 24); parasites of leaf-mining larvae of Tenthredinidae and less common of Coleoptera 2
— Pronope absent, pronotum with only a crenulate and comparatively narrow transverse groove; vein r of fore wing usually leaving pterostigma near basal third, exceptionally submedially (fig. 33); pterostigma of male not enlarged; parasites of leaf-mining larvae of Lepidoptera, Coleoptera, Diptera, and very rarely Tenthredinidae ..... *Colastes* Haliday
2. Posterior half of notauli distinctly impressed, (nearly) complete, usually (partly) crenulate, and with a short medio-posterior carina (fig. 28); vein r of fore wing departing from basal 0.4–0.6 of pterostigma (fig. 21), if from 0.4 then vein m-cu of fore wing only slightly converging to vein 1-M poste-

riorly (cf. fig. 21); posterior margin of pterostigma just basad of vein r (sub)parallel to costal margin of pterostigma (figs. 21, 24) .. *Xenarcha* Foerster

— Posterior half of notauli absent or obsolescent and mesoscutum finely aciculate or smooth medio-posteriorly (figs. 8, 15); vein r of fore wing usually departing between basal third and base of pterostigma (fig. 4); if departing near basal 0.4 of pterostigma, then vein m-cu of fore wing distinctly converging to vein 1-M posteriorly (figs. 12, 32); posterior margin of pterostigma just basad of vein r nowhere near parallel to costal margin of pterostigma (figs. 4, 12, 32) ..... *Shawiana* gen. nov.

Colastes Haliday

Haliday, 1833: 266. Shenefelt, 1975: 1115. Shaw, 1983: 309–310.

Type-species: *Colastes braconius* Haliday, 1833 (monotypy).

Diagnosis. — Pronope absent or nearly so, pronotum at most with a (sometimes curved) transverse groove anteriorly; vein r of fore wing leaving pterostigma near basal third of pterostigma, exceptionally submedially (fig. 33); pterostigma of male not enlarged; no feeding of host larvae after parasitation and no movement of host when left undisturbed (Shaw, 1983: 312).

Syn.: *Exothecus* Wesmael, 1838; the female type of the type-species (*E. affinis* Wesmael, 1838) has been examined and is correctly treated as a good species by Papp (1975). The examination of the type of *E. debilis* Wesmael, 1838, proved that this species is correctly synonymized with *C. braconius*.

The only common W. European species is *Colastes braconius* Haliday, of which syntypes in the Haliday Collection have been examined. It is an extremely polyphagous ectoparasite of mining larvae of Gracillariidae, Curculionidae, Nepticulidae, Tischeriidae, Momphidae, Lyonetiidae, Heliozelidae, and Agromyzidae, while it attacks Tenthredinidae only very rarely (Shaw, 1983). A key to *Colastes* (sensu lato) by Papp (1975: 417–420) includes species of *Shawiana*, but is incomplete in lacking *Colastes fragilis* (Haliday, 1836) **comb. nov.**

Of *C. fragilis* I have seen both the female types in the Haliday Collection; the one with "91" on the card and "16" on the small red label is here designated as lectotype. Vein r of fore wing inserted submedially at pterostigma and slightly oblique (fig. 33), length of 3th antennal segment 4 times its width (fig. 34), and vein 3-SR of fore wing 1.4 times vein 2-SR.

Shawiana gen. nov.

Type-species: *Exothecus laevis* Thomson, 1892.

Etymology: named after Dr. M.R. Shaw (Edinburgh), whose investigations have considerably enlarged the knowledge of the biology of the Rogadinae. Gender: feminine.

Diagnosis. — Pronope present (figs. 8, 15); vein r of fore wing leaving pterostigma usually between basal third and base of pterostigma (fig. 4); if exceptionally from basal 0.4 of pterostigma, then vein m-cu of fore wing distinctly converging to vein 1-M posteriorly; pterostigma of male similar to pterostigma of female ; eggs moderately sticky, tending to be picked up by moving host; no feeding of host larva after parasitization, but larva recovers and sometimes moves to feeding position (Shaw, 1983: 312).

Syn.: *Phanomeris* auct. p.p. (e.g., Shaw, 1983: 310–312).

A rather small genus, with oligophagous ectoparasites of leaf-mining larvae of Tenthredinidae; a probably new species near *laevis* has been reared from leaf-mining Chrysomelidae by Dr. M.R. Shaw.

KEY TO N.W. EUROPEAN SPECIES OF *SHAWIANA* GEN. NOV.

1. At least basal third of 2nd metasomal tergite (and sometimes 3rd partly) sculptured (fig. 19); vein m–cu of fore wing rather strongly converging to vein 1–M posteriorly (figs. 12, 31) 2
— Second and 3rd tergites smooth (fig. 9); vein m–cu of fore wing at most moderately converging to vein 1–M posteriorly (fig. 4) 3
2. Third antennal segment robust (fig. 31); antennal segments 30–37; 1st subdiscal cell of fore wing comparatively robust (figs. 30, 32); 2nd metasomal tergite (rather) coarsely strigose, but variable in extent; vein 3-CU1 of fore wing often distinctly curved (fig. 30); parasites of arboreal leaf-mining Blennocampinae-Fenusini ..... *catenator* (Haliday)
— Third antennal segment moderately slender (fig. 13); antennal segments 38–45; 1st subdiscal cell of fore wing less robust (figs. 11, 12); 2nd tergite (very) finely rugulose (fig. 19); vein 3-CU1 of fore wing straight (fig. 11); parasites of arboreal leaf-mining Heterarthrinae ..... *phyllotomae* (Muesebeck)
3. Vein r of fore wing emitted near basal third of pterostigma (fig. 4); hind coxa yellowish basally; length of ovipositor sheath 0.1–0.4 times fore wing; length of vein 3-SR of fore wing 1.3–2.1 times vein 2-SR 4
— Vein r emitted near basal 1/6th of pterostigma; hind coxa dark brown or blackish basally; length of ovipositor sheath 0.32–0.36 times fore wing; length of vein 3-SR of fore wing 1.6–1.8 times vein 2-SR ..... *lapponica* (Thomson)

4. Length of ovipositor sheath 0.34–0.40 times fore wing; vein r of fore wing about as long as maximum width of pterostigma; apical third of metasoma of female dark brown ventrally; vein 3-SR of fore wing 1.6–2.1 times vein 2-SR ..... *foveolator* (Thomson)
— Length of ovipositor sheath 0.11–0.14 times fore wing; vein r of fore wing somewhat shorter then width of pterostigma (fig. 4); apical third of metasoma of female largely light brown ventrally; vein 3-SR of fore wing 1.3–1.6 times vein 2-SR (fig. 4) ..... *laevis* (Thomson)

***Shawiana laevis** (Thomson) comb. nov.
(figs. 1–9)

Exothecus laevis Thomson, 1892: 1699.
Colastes laevis; Shenefelt, 1975: 1120–1121.
Phanomeris laevis; Shaw, 1983: 311–312.

Lectotype, ♀, length of body 3.2 mm, of fore wing 3.5 mm.

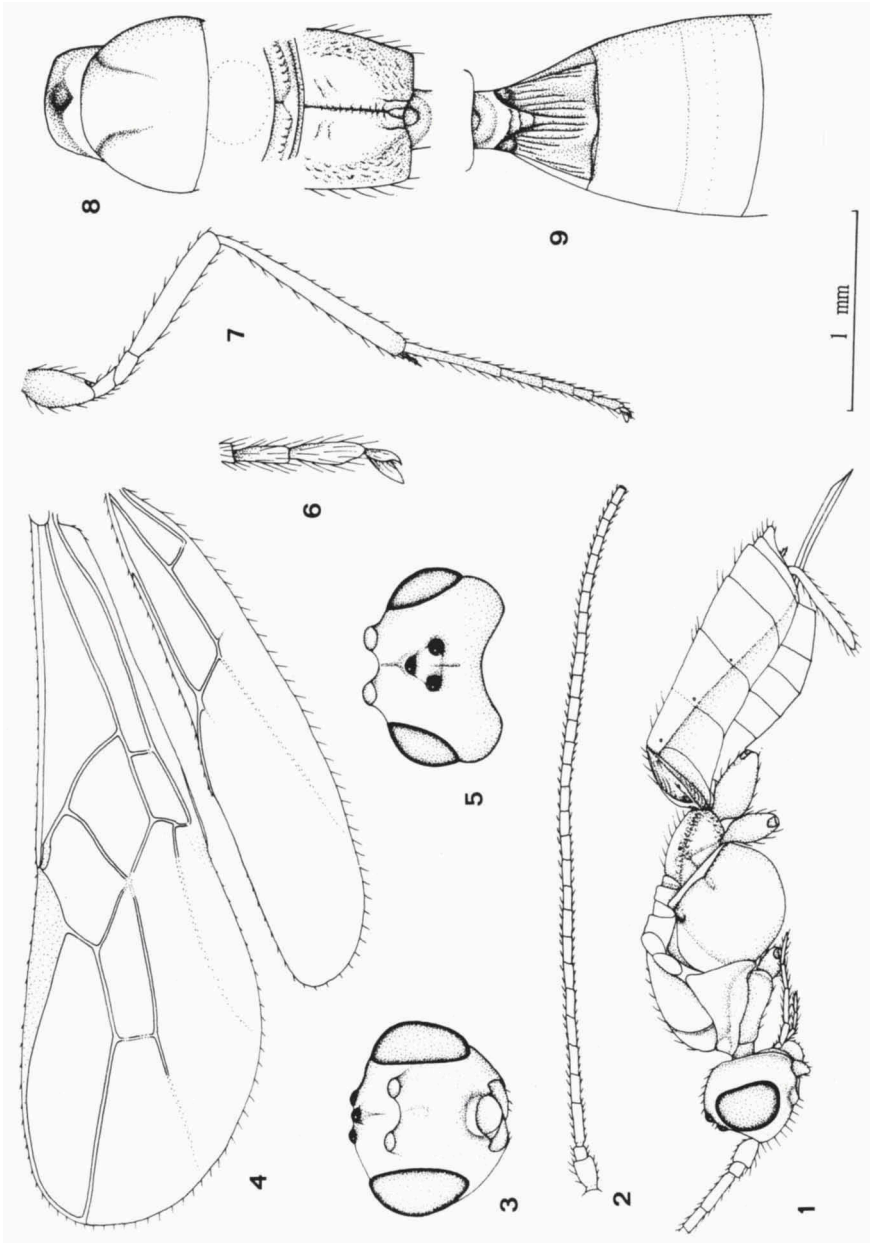
Head. — Antennal segments incomplete, remaining 30, length of 3rd segment 1.4 times 4th segment, length of 3rd and 4th segments 3.7 and 2.7 times their width, respectively; length of maxillary palp 1.5 times height of head (1.3 times if measured from mandibular condylus); occipital carina only laterally present, up to upper level of eyes; length of eye in dorsal view 1.6 times temple (fig. 5); POL: Ø ocellus: OOL = 8 : 7 : 12; face rather flat, medially smooth, laterally coriaceous (fig. 3); clypeus smooth; length of malar space 1.1 times basal width of mandible; both teeth of mandible acute, rather short and subequal; mandible twisted apically.

Mesosoma. — Length of mesosoma 1.7 times its height; pronope large, deep and subelliptical (fig. 8); mesopleuron largely glabrous and smooth; only ventral half of pleural suture finely crenulate (fig. 1); episternal scrobe deep and elliptical (fig. 1); propodeum medially largely smooth, but near medial carina, posteriorly and laterally finely rugulose (fig. 8); medial carina of propodeum almost complete, posteriorly obsolescent (fig. 8).

Wings. — Fore wing: posterior margin of pterostigma slightly curved basally and beyond r straight (fig. 4); r at basal third of pterostigma; r: 3-SR: SR1 = 7 : 19 : 37; 1-CU1 : 2-CU1 = 4 : 13; 2-SR : 3-SR : r-m = 14 : 19 : 8; m-cu shortly antefurcal and converging to 1-M posteriorly (fig. 4).

Legs. — Length of femur, tibia and basitarsus of hind leg 5.4, 10.1, and 8.3 times their width, respectively; length of hind tibial spurs 0.15 and 0.25 times hind basitarsus.

Metasoma. — Length of 1st tergite equal to its apical width, its surface longitudinally rugose-striate, laterally obsolescent sculpture (fig. 9); dorsal cari-



Figs. 1–9, *Shawiana laevis* (Thomson), lectotype, ♀. 1, habitus, lateral aspect; 2, antenna; 3, head, frontal aspect; 4, wings; 5, head, dorsal aspect; 6, hind claw; 7, hind leg; 8, mesosoma, dorsal aspect; 9, 1st–3rd metasomal tergites, dorsal aspect. 1, 2, 4, 7: scale-line (= 1×); 3, 5, 8, 9: 1.5 ×; 6: 3 ×.

nae of 1st tergite reaching nearly to apex, (sub)parallel posteriorly; dorsope large (fig. 9); 2nd tergite completely smooth; 2nd metasomal suture obsolescent; length of ovipositor sheath 0.14 times fore wing; hypopygium large and truncate apically.

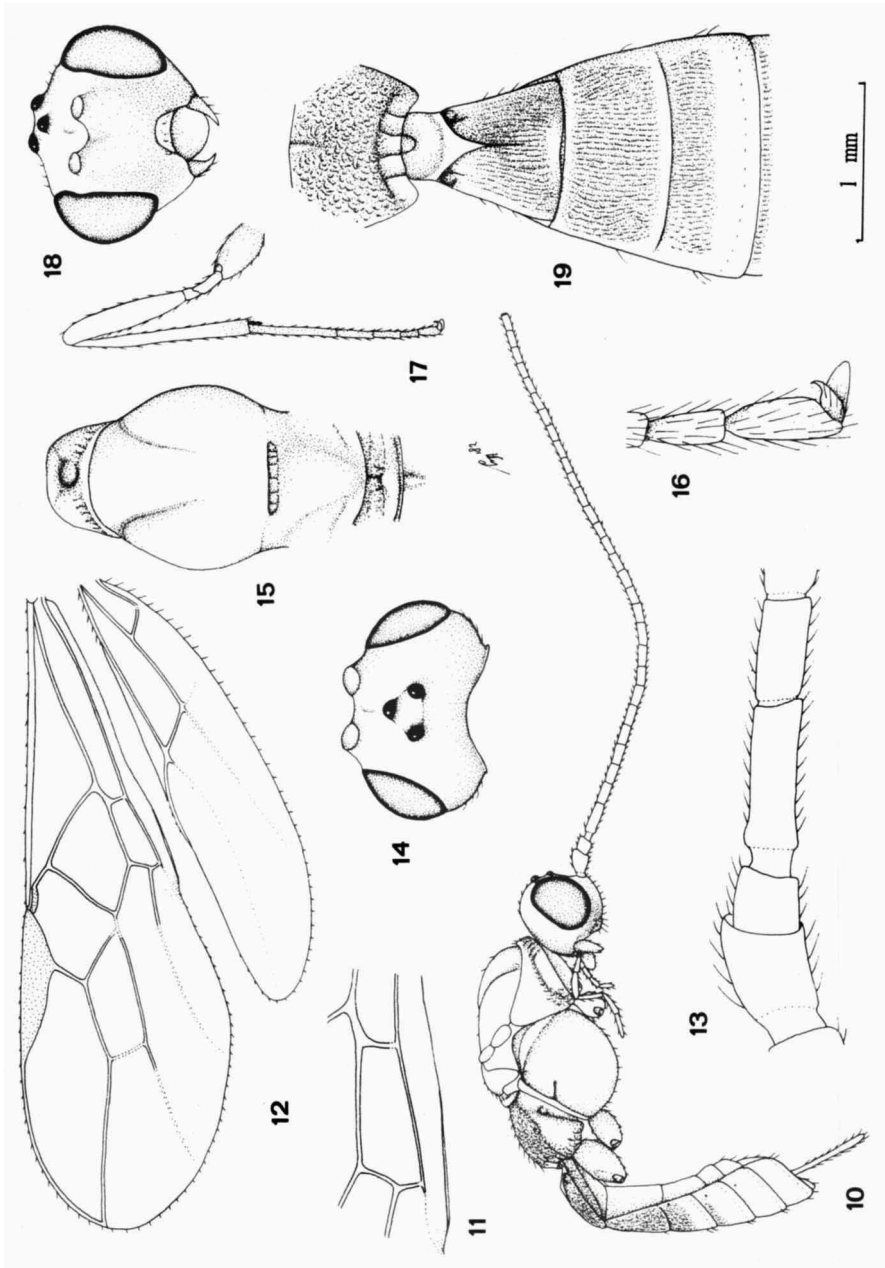
Colour. — Black; scapus, and pedicellus ventrally, 3rd–5th antennal segments, tegulae, metasoma ventrally, 2nd tergite laterally and posterior two-thirds of 3rd–7th tergites, largely light brown; rest of tergites and antenna, dark brown; palpi and legs, light yellowish; apex of hind tibia (narrowly) and all tarsi slightly infuscated; pterostigma and wing veins, dark brown.

Lectotype here designated, in the Zoological Museum at Lund: "Pål" (= Pålsjö, at Helsingborg in Skåne, the type-locality given by Thomson), "laevis", "1973, 644" and "1981, 814". Paralectotypes: 5 ♀ and 2 ♂, all from Pålsjö. Additionally I have examined specimens from the Netherlands (Waarder, coppice-wood, in peat district) and England (Woolhampton and Bearwood, Reading, both Berkshire). Variation: length of fore wing 2.6–2.9 mm (♂) or 3.2–3.8 mm (♀), length of body 2.4–2.9 mm (♂) or 2.6–3.6 mm (♀); antenna of ♀ only basally yellowish, in ♂ extended to 4 or 5 basal segments; penultimate segment of a ♀- paralectotype twice its width; antennal segments 33–34 (♂) or 35–37 (♀); male pterostigma similar to pterostigma of female; dorsal carinae of 1st tergite sometimes united; length of ovipositor sheath 0.11–0.14 times fore wing. Examined reared specimens are from *Heterarthrus aceris* (Kaltenbach) in *Acer* spp. in midsummer and from *Fenusa dohrni* (Tischbein) and *Heterarthrus vagans* (Fallén) in *Alnus glutinosa* L. in autumn in S. & C. Britain (Shaw, 1983: 311). Further recorded from *Heterarthrus microcephala* (Klug) in *Salix* spp., *Pontania vesicator* Bremi (Hymenoptera) and *Rhynchaenus (Orchestes)* sp. (Coleoptera); but these records are doubtful and need to be confirmed. The "var. *rugulosa* Fulmek, 1962" is a nomen nudum, reported from *H. microcephala*.

Shawiana catenator (Haliday) comb. nov.
(figs. 30–32)

Rogas (Colastes) catenator Haliday, 1836: 93.
Phanomeris catenator; Shenefelt, 1975: 1130–1131. Shaw, 1983: 310–311.

In the Haliday Collection (Dublin) is a female with the label "*catenator*" (probably in Haliday's handwriting), "3" on the card, "*Colastes catenator* Hal., ♀, Type!, AWS, 7.9.1932". This female is here designated as the lectotype. Length of fore wing 2.9 mm; length of body 2.6 mm; length of ovipositor sheath 0.10 times fore wing; face largely shiny and smooth, laterally rather pimply; propodeum largely smooth medially; antennal segments 33 (as stated



Figs. 10–19, *Shawiana phyllotomae* (Muesebeck), holotype, ♀. 10, habitus, lateral aspect; 11, detail of 1st subdiscal cell of fore wing; 12, wings; 13, 1st–4th antennal segments; 14, head, dorsal aspect; 15, thorax, dorsal aspect; 16, hind claw; 17, hind leg; 18, head, frontal aspect; 19, propodeum and 1st–3rd metasomal tergites, dorsal aspect. 10, 12, 17: scale-line (= 1×); 11, 14, 15, 18, 19: 2×; 13, 16: 5×.

by Haliday); pronope very large, deep, and (sub)circular; posterior side of pterostigma nearly straight (fig. 32); notauli very shallow, obsolescent posteriorly; hind coxae and palpi yellowish basally; vein r from basal 0.4 of pterostigma (fig. 32); 3rd antennal segment (fig. 31) and 1st subdiscal cell of fore wing (fig. 30) robust; 2nd metasomal suture crenulate and distinct medially; 1st tergite longitudinally striate, with long medial carina; hind tarsus and apex of hind tibia infuscated.

Specimens examined from the Netherlands are from Wijster, Heelsum and the dunes of Meijendel and Oostvoorne. The older records are unreliable and cannot confirmed. As stated by Shaw (1983: 311), *S. catenator* is a parasite of arboreal leafmining Fenusini on *Tilia (Parna tenella* (Klug)), on *Populus (Messa hortulana* (Klug)), on *Betula (M. nana* (Klug)), on *Ulmus (Fenusa ulmi* Sund.), and on *Quercus (Profenusa pygmaea* (Klug)).

Shawiana phyllotomae (Muesebeck) comb. nov.
(figs. 10–19)

Phanomeris phyllotomae Muesebeck, 1932: 83. Shenefelt, 1975: 1132.

Holotype, ♀, length of body 3.5 mm, of fore wing 4 mm.

Head. — Remaining antennal segments 31 (totally 41 according to original description), rather adpressed setose, length of 3rd segment 1.5 times 4th segment, length of 3rd and 4th segments 3.4 and 2.2 times their width, respectively (fig. 13); length of maxillary palp 1.5 times height of head; occipital carina interrupted dorsally about width of stemmaticum (fig. 14); length of eye in dorsal view 2.2 times temple (fig. 14); zone below antennal sockets conspicuously setose; POL : Ø ocellus : OOL = 10 : 7 : 13; face medially punctulate and laterally coriaceous, rather mat, especially ventrally (fig. 18); clypeus nearly flat and with some small depressions (fig. 18); length of malar space equal to basal width of mandible; mandible not distinctly twisted, and its 1st tooth distinctly longer than 2nd tooth.

Mesosoma. — Length of mesosoma 1.6 times its height; pronope large, very deep and round (fig. 15); mesopleuron smooth, sparsely setose near ventral part; pleural sulcus smooth; episternal scrobe narrow, linear and distinct (fig. 10); surface of propodeum finely and densely rugulose (fig. 19); medial carina of propodeum absent, but anteriorly with short elevation (fig. 19).

Wings. — Fore wing: first subdiscal cell rather slender and slightly widened apically (figs. 11, 12); 3-CU1 straight (fig. 11); r : 3-SR : SR1 = 6 : 16 : 33; r departs from near basal 0.4 of pterostigma, baso-posterior side slightly curved (fig. 12); 1-CU1 : 2-CU1 = 3 : 13; 2-SR : 3-SR : r-m = 12 : 16 : 7; m-cu distinctly antefurcal and strongly converging to 1-M posteriorly (fig. 12).

Legs. — Length of femur, tibia, and basitarsus of hind leg 5.2, 10.4 and 8.7 times their width, respectively; length of hind tibial spurs 0.15 and 0.2 times hind basitarsus.

Metasoma. — Length of 1st tergite 1.1 times its apical width, its surface (as 2nd and base of 3rd tergite) finely and densely rugulose (fig. 19); 2nd suture deep and nearly straight medially, smooth; 3rd–6th tergites with membranous apical margins; length of ovipositor sheath 0.13 times fore wing.

Colour. — Black; tegulae, basal half of vein C + SC + R of fore wing, palpi, clypeus ventrally, annellus, legs (but telotarsi, apex of hind tibia and hind tarsus, dark brown), yellowish; 6 basal segments of antenna brown, rest dark brown or blackish; membranous apices of 3rd–6th tergites and sides of metasoma, narrowly yellowish-brown; dorso-posterior corner of pronotal sides and anterior subalar elevation, yellowish; hind tibia ivory with its apex dark brown.

Holotype in U.S. National Museum, Washington: "Ex *Phyllotoma nemorata* Fall.", "Austria, vi. 1931", "GipMoth Lab. 13618". "Type No. 44062 U.S.N.M.", "*Phanomeris phyllotomae* Mues., Type, Det. Muesebeck". Paratypes: 4 ♀ and 5 ♂, all reared from *Heterarthrus nemoratus* (Fallén), a hymenopterous leafminer of thick leaves chiefly at the tops of *Betula* trees, and belonging to the Tenthredinidae Heterarthrinae. Some specimens were liberated in New Hampshire (USA).

Note. In the same paper Muesebeck described the Nearctic *Phanomeris metalli* Muesebeck, 1932, which obviously belongs also to the genus *Shawiana* **(comb. nov.)**.

Shawiana lapponica (Thomson) comb. nov.

Exothecus lapponicus Thomson, 1892: 1699.
Colastes lapponicus; Shenefelt, 1975: 1121.

The interpretation of this species is based on the examination of the female type in the Thomson Collection (Lund).

Shawiana foveolator (Thomson) comb. nov.

Exothecus foveolator Thomson, 1892: 1698.
Colastes foveolator; Shenefelt, 1975: 1119–1120.

The holotype of *S. foveolator* has been examined in the Thomson Collection at Lund.

Xenarcha Foerster

Foerster, 1862: 235. Shenefelt, 1975: 1130–1131, 1137–1138. Shaw, 1983: 312–313.

Type–species: *Rogas lustrator* Haliday, 1836 (monotypy).

Diagnosis. — Pronope present (fig. 28); vein r of fore wing departing between basal 0.4–0.6 of pterostigma (figs. 21, 24); vein m-cu of fore wing slightly converging to vein 1-M posteriorly (fig. 21); pterostigma of male often (somewhat) widened compared with female (fig. 24 versus 21); eggs distinctly sticky; host larva resumes feeding after being stung (Shaw, 1983: 312).

Syn.: *Phanomeris* Foerster, 1862, **syn. nov.** (description of its type-species, *X. abnormis* (Wesmael) below); *Zamegaspilus* Ashmead, 1900 (the examined type of the type species, *Z. hopkinsi* Ashmead, 1900, differs only by the stronger impressed malar suture).

Key to Palaearctic species of *Xenarcha* Foerster

1. Face (except medially) evenly coriaceous and mat; antennal segments 34–41; epicnemial area distinctly rugose dorsally 2
— Face largely smooth and shiny, at most ventral half rugulose (*effecta*); antennal segments 22–38; epicnemial area usually smooth or superficially sculptured (fig. 20) 3
2. Second tergite of metasoma black and strongly striate; vein r departs from or behind middle of pterostigma; scutellum finely crenulate medio-posteriorly; mesopleuron aciculate behind fore coxae; hind coxae densely rugulose ..... *lustrator* (Haliday)
— Second tergite reddish, superficially and finely sculptured; vein r departs near basal 0.4 of pterostigma; scutellum smooth medio-posteriorly; mesopleuron smooth behind fore coxae; sculpture of hind coxae obsolescent ..... *laticarpus* (Thomson)
3. Antennal segments of female 29–38, 2nd metasomal tergite usually largely sculptured (fig. 29); wing membrane light brownish; face completely smooth; length of ovipositor sheath about 0.2–0.3 times metasoma, about as long as hind basitarsus of shorter (fig. 20) ..... *abnormis* (Wesmael)
— Antennal segments of female 27–28; at least apical third of 2nd tergite smooth; wing membrane (sub)hyaline; ventral half of face rugulose; length of ovipositor sheath 0.7–0.8 times metasoma, much longer than hind basitarsus ..... *effecta* (Papp)

***Xenarcha lustrator** (Haliday)

Rogas (Colastes) lustrator Haliday, 1836: 58.
Xenarcha lustrator; Shenefelt, 1975: 1137–1138. Shaw, 1983: 312.
Bracon dimidiatus Nees, 1834: 108 (nec Spinola, 1808 and Nees, 1812). **Syn. nov.**.
Phanomeris thomsoni Szépligeti, 1906: 596. Shenefelt, 1975: 1133. **Syn. nov.**

A male type in the Haliday Collection (Dublin) has been examined; the combination of the colour and the wide pterostigma makes its identification easy; the female, however, is often misinterpreted. E.g., *Bracon dimidiatus* Nees, 1834, has been synonymized with *Shawiana catenator* (= *Phanomeris catenator*; Shenefelt, 1975: 1131), but from its description it is clear that it concerns *lustrator* (because of the trilobate mesoscutum and reddish posterior half of metasoma). Some specimens of *X. abnormis* may have the metasoma behind the 2nd tergite largely reddish too, but then the apical segments of the metasoma are darkened and the sides of the 2nd tergite are reddish. The lectotype of *X. thomsoni* selected by Dr. J. Papp has been examined in the Thomson Collection (Lund).

It is a parasite of Tenthredinidae Fenusini in herbs and shrubs: *Fenella nigrita* Westwood in *Potentilla reptans* L. and *Agrimonia eupatoria* L. (Shaw, 1983: 312) and *Metallus pumilus* (Klug) in *Rubus* (Netherlands, Thorn). Additional Dutch specimens seen from Oostvoorne (dunes), Geertruidenberg and Waarder.

Xenarcha laticarpus (Thomson) comb. nov.

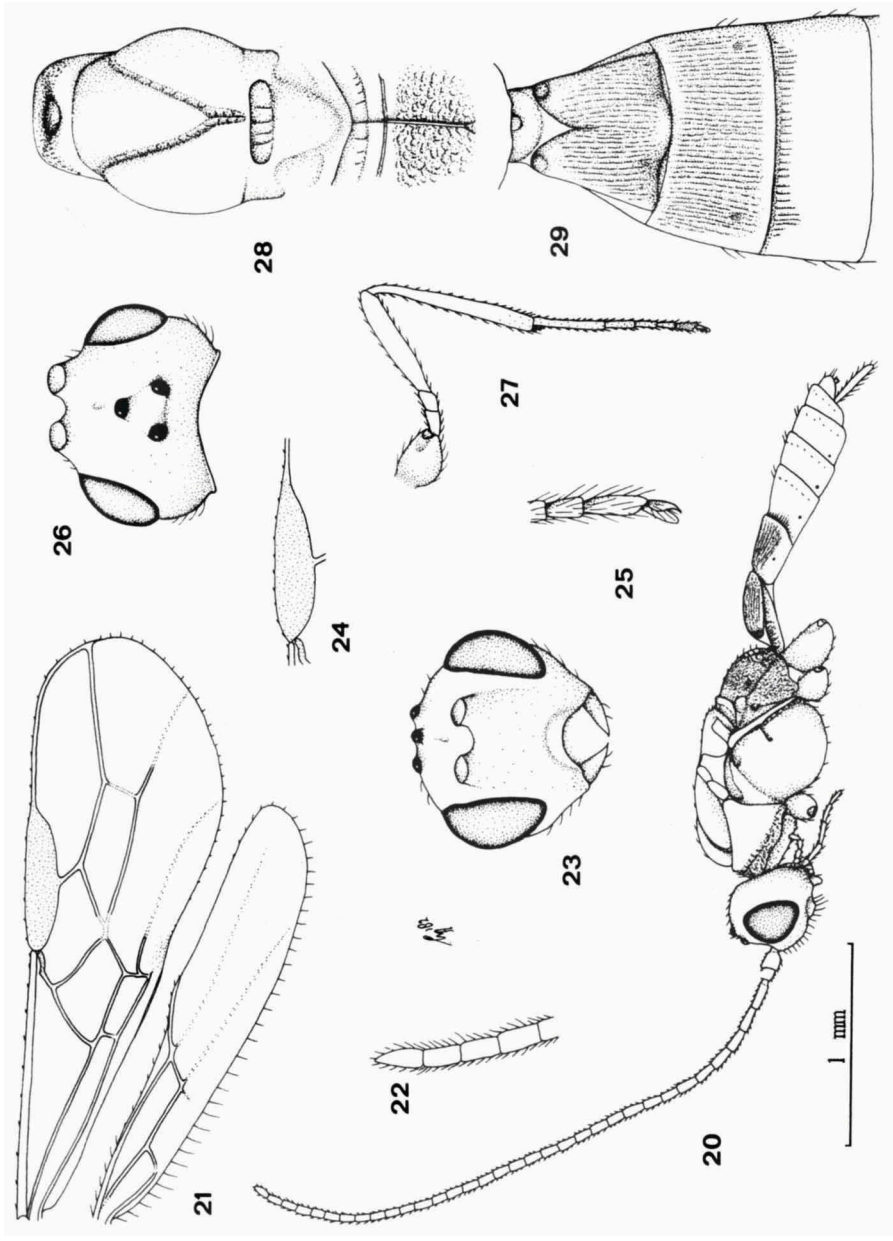
Exothecus laticarpus Thomson, 1892: 1700.
Colastes laticarpus; Shenefelt, 1975: 1121. Papp, 1975: 418, 420.
Exothecus flaviventris Thomson, 1892: 1700.
Colastes flaviventris; Shenefelt, 1975: 1119. Papp, 1975: 420.

Of both species the types were examined and the synonymization by Papp (1975) is correct. I have seen a female from Austria (new for the Austrian fauna): "Fresach, Kärnten, 600 m, 3–15.vi.1973, J.B. Wolschrijn" (Museum Leiden).

Xenarcha effecta (Papp) comb. nov.

Exothecus effectus Papp, 1972: 323–325, figs. 1–3.
Colastes effectus; Shenefelt, 1975: 1119.
Rhysipolis effectus; Papp, 1975: 421.

The inclusion of *X. effecta* is based on the examination of the holotype from China in the Institut für Pflanzenschutzforschung at Eberswalde.



Figs. 20–29, *Xenarcha abnormis* (Wesmael), U.K., Reading, ♀ (but 24 of ♂). 20, habitus, lateral aspect; 21, wings; 22, apex of antenna; 23, head, frontal aspect; 24, pterostigma of ♂; 25, hind claw; 26, head, dorsal aspect; 27, hind leg; 28, mesosoma, dorsal aspect; 29, 1st–3rd metasomal tergites, dorsal aspect. 20, 21, 24, 27: scale-line (= 1 ×); 22, 25: 2.5 ×; 23, 26, 28, 29: 1.8 ×.

*Xenarcha abnormis (Wesmael) comb. nov.
(figs. 20–29)

Exothecus abnormis Wesmael, 1838: 74.
Phanomeris abnormis; Shenefelt, 1975: 1131.
Exothecus glabricollis Thomson, 1892: 1696. **Syn. nov.**.
Phanomeris glabricollis; Shenefelt, 1975: 1131.
Xenarcha sp. indet.; Shaw, 1983: 312–313.

Redescribed from a female (Reading, U.K.) conspecific with the lectotype. Length of body 2.8 mm, length of fore wing 2.9 mm.

Head. — Antennal segments 35, length of 3rd segment 1.4 times 4th segment, length of 3rd and 4th segments 3.3 and 2.3 times their width, respectively, and penultimate segment 1.9 times its width (fig. 22); length of maxillary palp 1.1 times height of head; occipital carina widely interrupted dorsally, reduced ventrally, more or less connected to hypostomal carina and ventrally mixed with rugulosity; length of eye 1.6 times temple dorsally; POL : Ø ocellus : OOL = 6 : 3 : 8; face punctulate (fig. 23); clypeus rather flat and smooth; length of malar space 1.1 times basal width of mandible; malar suture absent; mandible twisted apically.

Mesosoma. — Length of mesosoma 1.7 times its height; pronope large, deep and wide elliptical (fig. 28); epicnemial area and rest of mesopleuron smooth (fig. 20); notauli completely impressed, rather crenulate (fig. 28); surface of propodeum anteriorly narrowly smooth, posteriorly spaced reticulate, rest finely and densely rugulose (fig. 28); medial carina of propodeum long, forked posteriorly.

Wings. — Fore wing: posterior margin of pterostigma distinctly curved (fig. 21); r departs medially from pterostigma; r : 3-SR : SR1 = 9 : 35 : 55; 1-CU1 : 2-CU1 = 2 : 13; 2-SR : 3-SR : r-m = 24 : 35 : 14.

Legs. — Hind coxa smooth; length of femur, tibia and basitarsus of hind leg 4.8, 11 and 8 times their width, respectively; length of hind spurs about 0.2 times hind basitarsus.

Metasoma. — Length of 1st tergite equal to its apical width, its surface finely and weakly aciculate (fig. 29); dorsal carinae of 1st tergite united in basal third; dorsope deep (fig. 29); 2nd tergite largely finely aciculate; 2nd suture rather deep and finely aciculate (fig. 29); 3rd tergite smooth, except for some minor aciculation anteriorly (fig. 29); length of ovipositor sheath 0.11 times fore wing.

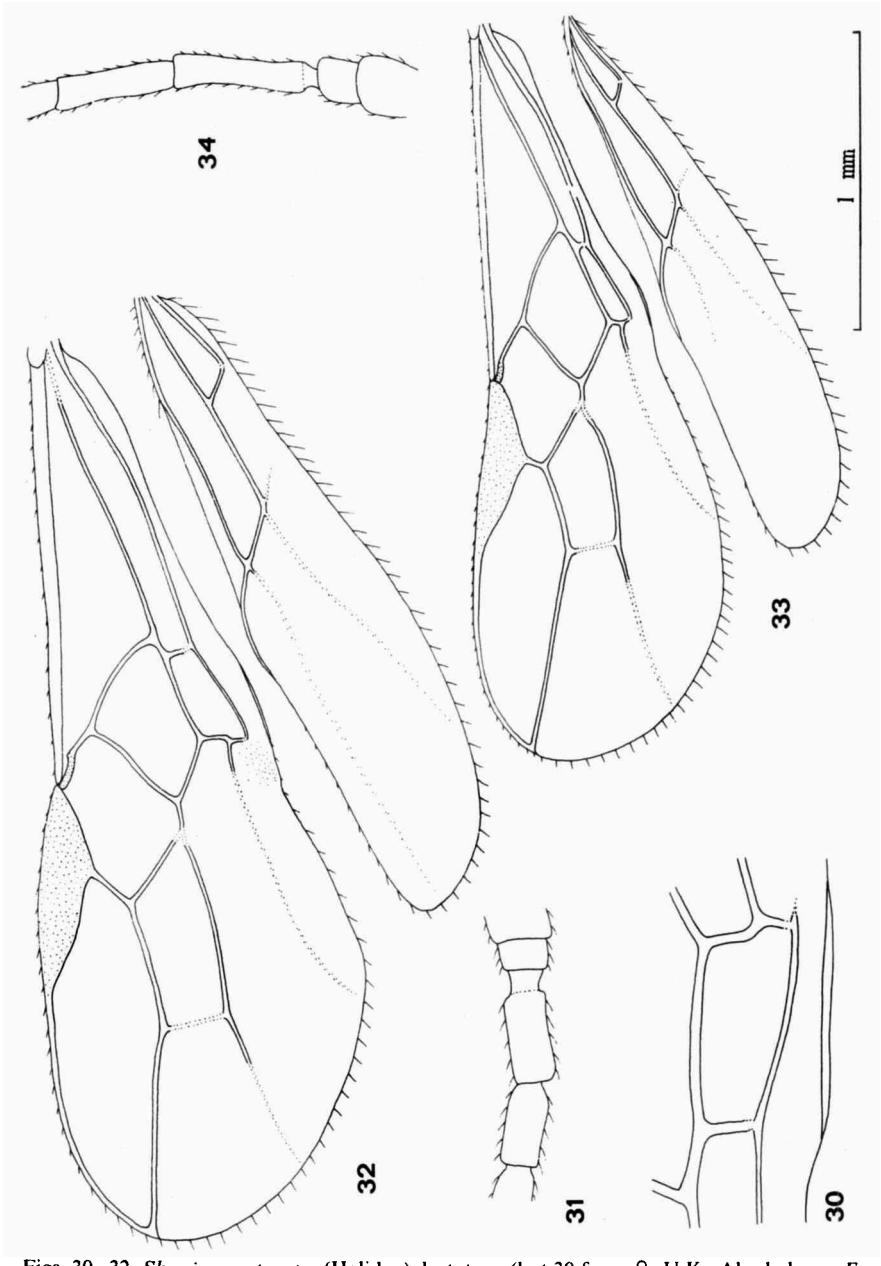
Colour. — Black(ish); annellus, humeral plate (the tegulum is brown as wing veins), legs (largely), apex of 2nd tergite, 3rd and 4th tergites (except dark apices), yellowish; pterostigma brown; palpi, telotarsi, base of hind coxa distinctly and apex of hind tibia and hind tarsus slightly infuscated; wing membrane slightly infuscated.

Lectotype (the female in the best condition selected by Dr. J. Papp from two conspecific females) in Wesmael Collection, Brussels: "var 1 ♀" (accidentally added label?), "Coll. Wesmael", "*E. abnormis* var. 1, dét. Wesmael", "R. Mus. Hist. Nat., Belg. I.G. 3.317", "Lectotypus *Exothecus abnormis* Wesmael, 1838, ♀, Papp, 1981", "*Phanomeris catenator* Hal., det. Papp, J., 1981". Redescribed after a female specimen in Museum Leiden: "Burghfield Com., Reading, Berks., H(ost): *Fenusa pusilla* (in) *Betula*", "HLC: 24.9.(19)79, PLE: coc(oon) made 2.10.(19)79, PIE: 14.6.1980, M.R. Shaw". The lectotype of *Exothecus glabricollis* Thomson, 1892 in the Thomson Collection (Lund) has been examined: "Lectotype *Exothecus glabricollis* Th., 1892, Papp, 1981", "Pål", "*Phanomeris catenator* Hal., det. Papp J. 1981". It has the 2nd tergite finely striate and the antennae are incomplete.

Variation. — Length of fore wing 2.4–3.4 mm; antennal segments of ♀ 31–36 (exceptionally 29), of ♂ (29–)32–36; palpi yellowish or infuscated; scapus largely yellowish-brown to blackish; pterostigma brown (♀) or dark brown (♂); pterostigma of male slightly larger (fig. 24); base of hind coxa yellowish-brown to dark brown; 2nd tergite coarsely (host in *Alnus*) or finely (host in *Betula*) striate or largely smooth; 2nd–4th tergites yellowish or brown, sculpture and colour vary within series from same host and locality; ♂ usually has 3rd and 4th (sometimes 5th) tergites bright yellowish; length of ovipositor sheath 0.11–0.13 times fore wing.

Note. — *Exothecus abnormis* Wesmael, 1838 (the type-species of *Phanomeris* Foerster, 1862) has been incorrectly synonymized with *Shawiana catenator* (Haliday) for a long time. However, *abnormis* differs as follows: vein r of fore wing emerges near the middle of the pterostigma (near basal 0.4 in *catenator* (fig. 32)), notauli medially distinct (but frequently destroyed posteriorly by pin; absent in *catenator*), baso-posterior margin of pterostigma weakly, but distinctly curved (less in *catenator*, fig. 21 versus fig. 32), ovipositor sheath often somewhat shorter than hind basitarsus (subequal in *catenator*), and vein m-cu of fore wing less converging to vein 1-M posteriorly (stronger in *catenator*, fig. 32). The lectotype of *abnormis* has the pronotum subvertical anteriorly and the 2nd tergite dark and finely striate; both are highly variable in *abnormis*. The lectotype of *abnormis* has 36 antennal segments, according to Wesmael 35, but this may be a miscount by Wesmael. Both the lectotypes of *abnormis* and *glabricollis* belong to the form with completely dark brownish metasoma and rather slender labial palpi.

Xenarcha abnormis is a parasite of *Fenusa pusilla* (Lepeletier) and (in Sweden) *Messa nana* (Klug) in *Betula* and of *F. dohrnii* (Tischbein) in lower branches of *Alnus*. From the Netherlands I have examined specimens from Arkel, Nunspeet, Tiel (Thedinghsweert, ex hymenopterous leafminer in *Alnus gluti-*



Figs. 30–32, *Shawiana catenator* (Haliday), lectotype (but 30 from ♀, U.K., Aberlady, ex *Fenusa ulmi* Sund.), ♀. 30: detail of 1st subdiscal cell of fore wing; 31, 2nd–4th antennal segments; 32, wings. Figs. 33–34, *Colastes fragilis* (Haliday), lectotype, ♀. 33, wings; 34, 2nd–4th antennal segments. 32, 33: scale-line (= 1 ×); 30: 1.8 ×; 31, 34: 2.5 ×.

nosa L.), Waarder, and (very commonly) Wijster. Appears mainly in (late) June and July, with few specimens in August and September (partial 2nd generation?). Further I have examined specimens from England (redescribed ♀ and a ♂ from same host and locality), from France (Fontainebleau forest, Seine & Marne and Presly, Cher., ex *Fenusa pusilla* (Lepeletier)), and from Sweden (Skåne, Önnemo and Hardeberga, ex *Fenusa pusilla* (Lepeletier) and *Messa nana* (Klug)).

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References

Achterberg, C. van, 1979. A revision of the subfamily Zelinae auct. (Hym., Braconidae). — Tijdschr. Ent., 122: 241–479, figs. 1–900.

Foerster, A., 1862. Synopsis der Familien und Gattungen der Braconen. — Verh. naturh. Ver. preus. Rheinl., 19: 225–288.

Haliday, A.H., 1833. An essay on the classification of the parasitic Hymenoptera of Britain, which correspond with the Ichneumones minuti of Linnaeus. — Ent. Mag., 1: 259–276.

——, 1836. Essay on parasitic Hymenoptera. — Ent. Mag., 92–106.

Muesebeck, C.F.W., 1932. Two new species of Phanomeris Foerster (Hym., Braconidae) parasitic on leaf-mining sawflies. — Proc. ent. Soc. Wash., 34: 81–83.

Nees von Esenbeck, C.G., 1834. Hymenopterorum Ichneumonibus affinium monographiae, genera Europaea et species illustrantes, pt. 1: 1–320.–J. G. Cottae, Stuttgartiae et Tubingae.

Papp, J., 1972. Exothecus effectus sp. n., a new braconid species from NE-China (Hym.). — Acta zool. hung., 18: 323–325, figs. 1–3.

——, 1975. Three new European species of Colastes Hal. with taxonomic remarks (Hym., Braconidae, Exothecinae). — Acta zool. hung., 21: 411–423.

Shaw, M.R., 1983. On evolution of endoparasitism: the biology of some genera of Rodadinae (Braconidae). — Contr. Am. ent. Inst., 20: 307–328.

Shenefelt, R.D., 1975. Braconidae, pt. 8. — Hym. Cat. (nov. ed.), 12: 1115–1262.

Szépligeti, G.V., 1906. Braconiden aus der Sammlung des ungarischen National Museums. — Annls hist.-nat. Mus. natn. hung., 4: 547–618.

Thomson, C.G., 1892. XLIV. Bidrag till Braconidernas kännedom. — Opusc. Ent., 16: 1659–1751.

Wesmael, C., 1838. Monographie des Braconides de Belgique. — Nouv. Mém. Acad. sci. R., 11: 1–166.