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Two new species of Chrysocharis Foerster and a new synonymy and record of Sympiesis Foerster (Hymenoptera : Chalcidoidea ; Eulophidae) from Western Canada

M. Doğanlar *

Summary

Chyrsocharis (Nesomyia) **yoshimotoi** sp.n. and C. (N.) **elmaellae** sp.n. (**Etedontinae**) are described from the Vancouver district, British Columbia, Canada. **Sympiesis conica** (Prov.), **S. compressicornis** (Prov.), **S. nigrifemora** Ashm., **S., nigripes** Ashm., and **S. massasoit** Crawf. are synonymized with **S. sericeicornis** (Nees), and **Sympiesis gordius** (Walker) is newly recorded from North America. All of the parasites were reared from mines of **Phyllonorycter elmaella** Doğanlar and Mutuura (Lepidoptera : Gracilariidae).

Introduction

Chrysocharis (Nesomyia) yoshimotoi sp.n., *C. (N.) elmaellae* sp.n., *Sympiesis sericeicornis* (Nees), and *S. gordius* (Walker) were reared from mines of *Phyllonorycter elmaella* Doğanlar and Mutuura (Lepidoptera); the allotype male of *C. (N.) yoshimotoi* was reared from mines of *Gracillaria syringella* (F.) (Lepidoptera) on *Syringa* sp. The larvae of *P .elmaella* were collected from leaves of apple and crapple in the Vancouver district, British Columbia, Canada.

All the specimens were studied by the author at the Biosystematics Research Institute, Ottawa, Ont., Canada, and were also examined by Dr. C. M. Yoshimoto of that institute, and by Dr. Z. Boucek of the Commonwealth Institute of Entomology, c/o British Museum (Natural History),

* Atatürk Üniversitesi, Ziraat Fakültesi, Bitki Koruma Bölümü, Erzurum-Turkey.
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London, England. The host species were identified by Dr. A. Mutuura of the Biosystematics Research Institute, Ottawa.

All types of the new species are deposited in the Canadian National Collection (CNC), Ottawa, Ontario, Canada.

Chrysocharis (Nesomyia) yoshimotoi* sp.n.
(Figs. 1, 2, 3)

Female : Length 1.83 mm. Body black, head and thorax with bright metallic blue-green reflection; antennal scape pale yellow, pedicel and flagellum brown; legs pale yellow, except pretarsi which are light brown and most of hind coxae brown to black with metallic lustre; tegulae yellow; gaster with blue-green lustre.

Head 1.2 times wider than thorax (3.3. : 2.6); malar scape distinctly narrower than breath of scape (3 : 5) and 0.18 times as long as distance between mouth margins; frons between toruli and frontal fork moderately, and vertex and occiput finely - reticulate; occiput slightly margined only behind ocelli; ocelli in form of triangle, ratio of distance between frontal ocellus and lateral ocelli (OCL) and distance between lateral ocelli 0.7 : 0.9; scape 5.6 times as long as wide combined length of antennal flagellum and pedical as wide as head (3.4 : 3.3); scape not reaching frontal ocellus; length of antenna including scape in ratio 2.8 : 0.9 : 0.25 (3rd annellus): 0.9 : 0.9 : 0.8 : 0.6 : 0.75 (including spicule).

Thorax (fig. 1) about 1.6 times as long wide (4.2 : 2.6); mesoscutum and scutellum moderately - reticulated; scutellum slightly longer than wide (3.3 : 2.8), concave, and apical margin rounded; ratio of distance between level scutellar bristles and anterior margin of scutellum and distance between level of scutellar bristles and tip of scutellum 11 : 9; dorsellum crescentic, finely - reticulate, and 1/2 as long as mid length of propodeum, propodeum short, about 1/3 as long as length of scutellum (1.1 : 3.3), rugose, with irregular longitudinal rugae instead of median carina, callus with 2 setae (fig. 2); hind coxae finely reticulate, with 3 setae on dorsal margin; fore wing about 2 times as long as wide, apical margin rounded; under side of subcostal vein with 8 setae; speculum open near basal vein, marginal vein plus parastigma 6.75 times as long as stigmal vein; postmarginal vein shorter than twice of stigmal vein.

Petiole subconical, about twice as wide as long (1.3 : 0.7), smooth, gaster elongate, about 2.5 times longer than wide (fig. 3), surface covered with

(*) Kamijo, 1976.

sparse hairs, last segment of gaster 1.7 times longer than distance between cerci.

Male : Lenth 1.35 mm. Similar to female except as follows : Frons and vertex black with metallic golden-green reflection; legs pale yellow, except coxae brown to black with metallic lustre; trochanters and basal half of hind femora brown; tegulae brown, basilar sclerites of wing black.

Scape 3.66 times as long as wide (11 : 3); antennal flagellum plus pedicel shorter than breadth of head (2.0 : 2.4); length of antenna including scape in ratio 2.0 : 0.65 : 0.1 (3rd annellus) : 0.5 : 0.5 : 0.6 : 0.58 : 0.62 (including spicule). Under side of subcostal vein of fore wing with 3 setae, speculum closed; marginal vein plus parastigma 7 times as long as stigmal vein; petiole subconical, 1.3 times as wide as long (0.78 : 0.6); gaster about 1.6 times longer than wide (2.2 : 1.4).

Biology : This species is a solitary parasite of the larvae of *P. elmaella* on apple tree and of *G. syringella* on *Syringa sp.*. It pupates inside the mine of the host. The parasitism is about 1.33 % of the host larvae.

Types : Holotype, female, Haney, B.C., 5. IX. 77, M. Doğanlar ex *P. elmaella* on *Malus* (CNC). Allotype, male, Burnaby, B. C., 15. VIII. 77, M. Doğanlar ex *G. syringella* (F.) on *Syringa* (CNC).

Diagnosis : This species resembles only *C. hirsutiventris* Yshm. and *C. walleyi* Yshm. from North America and *C. laomedon* (Walker) from Europe. First two species are the only species known with elongate gaster in female from North America (Yoshimoto, 1973). It differs from them by having the differently shaped median sculpture of the propodeum, forming some irregular longitudinal rugae instead of median carinae (Fig. 2), the antennal scape and the last gastral segment being narrower and shorter than that of both species, and the under side of subcostal vein with 8 setae (5 setae in *C. hirsutiventris* and *C. walleyi). C. yoshimotoi* and *C. hirsutiventris* differ from *C. walleyi* in having Y- shaped frontal fork and from *C. walleyi* and *C. laomedon* by having the malar space narrower than breadth of scape. *C. yoshimotoi* differs from *C. hirsutiventris* and *C. laomedon* in having body black with metallic bluegreen reflection (thorax is red-fiery to purple with metallic lustre in *hirsutiventris* and *laomedon); ratio* of distance between anterior margin of scutellum and level of scutellar bristles and distance between level of scutellar bristles and tip of scutellum 11 : 9 in female of *C. yoshimotoi* (the same ratio in *C. laomedon* 8:5), posterior 1/3 of scutellum in female of *C. yoshimotoi* rounded (that of *C. laomedon* more or less V-shaped) (figs. 1, 2, 4). Length of gaster in female of *C. yoshimotoi* 2.3 times longer than wide (that of *C. laomedon* 3 times longer than wide) (figs. 3, 5).

Chrysocharis (Necomyia) elmaellae sp.n.
(Figs. 6 - 9)

Female : Length 1.87-2.00 mm. Head and thorax with bright metallic blue-green reflection; antennae black; legs pale yellow, except coxae and basal 3/4 of femora which are black; tegulae brown; gaster black with blue-green lustre.

Head slightly narrower than thorax; malar space slightly wider than breadth of scape (4:3) and 0.33 times as long as distance between mouth margins; frons moderately, vertex finely reticulate (fig. 6), ratio of distance between frontal ocellus and lateral ocelli (OCL) and distance between lateral ocelli 7:5; scape 5 times as long as wide, combined length of antennal flagellum and pedical shorter than width of head (5:6); scape not reaching frontal ocellus; length of antenna including scape in ratio 3:1:0.2 (3 rd annellus): 0.9:0.7:0.8:0.8 (including spicula).

Thorax (Fig. 7) about 1.48 times as long as wide (8:5.5); mesoscutum and scutellum moderately reticulated; scutellum distinctly longer than wide (7:8.3), flattened to slightly concave, ratio of distance between level of scutellar bristles and anterior margin of scutellum and distance between level of scutellar bristles and tip of scutellum 2:3; dorsellum crescentic, finely reticulated; propodeum about 1/3 as long as scutellum, alutaceous except bellow Y-shaped median carina which finely reticulated, hind margin with few irregular carinulae (Fig. 8); anterior margin of mesepimeron curved; hind coxae

Fig. 1. **Chrysocharis yoshimotoi** sp.n., female, mesonotum and scutellum (75x).

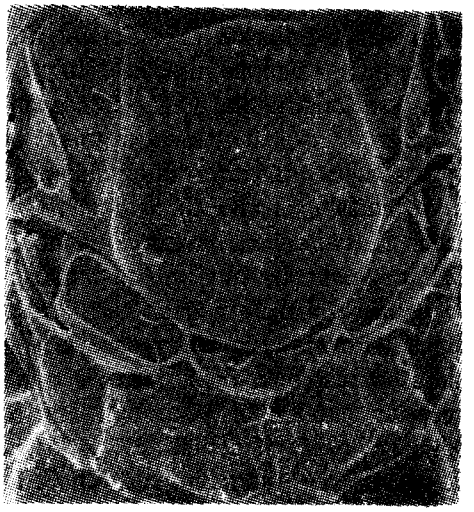

Fig. 2. **Chrysocharis yoshimotoi** sp.n., female, scutellum and propodeum (100x).

Fig. 3. **Chrysocharis yoshimotoi** sp.n., **female**, gaster (120x).

Fig. 4. **Chrysocharis laomedon** (Walker), female, mesonotum and scutellum (75x).

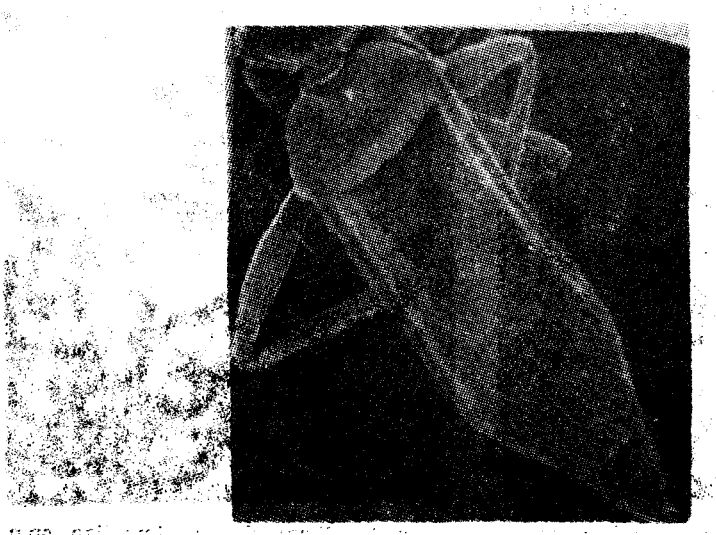

Fig. 5. **Chrysocharis laomedon** (Walker), female, gaster (160x).

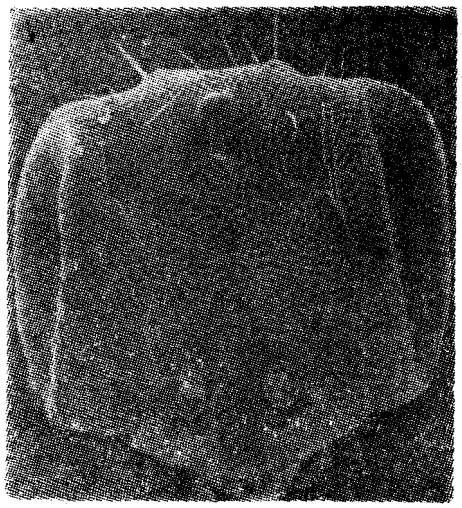

Fig. 6. **Chrysocharis elmaellae** sp.n., female, head (320 x).

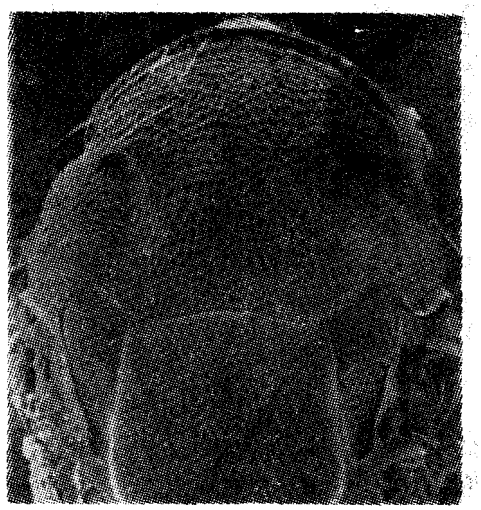

Fig. 7. **Chrysocharis elmaellae** sp.n., female, mesonotum and scutellum (280 x).

Fig. 8. **Chrysocharis elmaellae** sp.n., female, scutellum and propodeum (320 x).

Fig. 9. **Chrysocharis elmaellae sp.n.**, female, gaster (180 x).

microreticulate, dorsal margin without seta, forewing 2 times as long as wide, apical margin rounded; underside of submarginal vein with 7-9 setae; speculum closed, marginal vein plus parastigma about 7.3 times longer than stigmal vein; postmarginal vein about 2.0-2.3 times longer than stigmal vein.

Petiole conical, smooth, posteriorly with transverse microcarina. Gaster elongate-ovate, about 2.2 times as long as wide (fig. 9), slightly longer than thorax ,and shorter than head plus thorax.

Male : Length 1.25-1.62 mm. Similar to female except as follows: scape yellow; basal 1/6 of fore femur and basal half of mid and hind femora black.

Antennal scape ellipsoidal, flattened, about 3 times as long as wide; combined length of antennal flagellum and pedicel as long as width of head; length of antenna including scape in ratio 3.2:1:0.2 (3rd annellus): 0.8:1:0.9:0.8:1 (including spicula). Scutellum with deep, wide pits inside each scutellar bristle; marginal vein plus parastigma 6.3 times longer than stigmal vein.

Gaster oblong-ovate, 1.7 times longer than wide, narrow at base, gradually widening toward apex; 0.75 times as long as thorax, and 0.6 times as long as head plus thorax.

Biology : This species is a solitary parasite of the larvae of *P. elmaella* on apple tree. It pupates inside the mine of the host. The parasitism is about 5.3 % of the host larvae.

Types : Holotype, female, New Westminster, B.C., 24.VII.1978, Doğanlar, ex *Phyllonorycter elmaella* Doğanlar and Mutuura (CNC) Allotype, male New Westminster, B.C., 20.VII.1978, Doğanlar, same host as holotype (CNC).

Paratypes : 1 female, New Westminster, B.C., 12.VII.1978, Doğanlar; 1 male, Haney, B.C., 28.VIII.1977, Doğanlar, hosts of paratypes same as holotype (CNC).

Diagnosis : This species resembles only *C. cuspidigaster* Yshm. from North America and *C. nephereus* (Walker) from Europe. *C. elmaellae* differs from the former by having scape entirely black (that of *cuspidigaster* pale to orange-yellow); distance between frontal ocellus and posterior ocelli in ratio 7:5 (that of *cuspidigaster* 1:2); scape not reaching frontal ocellus (reaching in *cuspidigaster);* anterior margin of mesepimeron curved (that of *cuspidigaster* straight); marginal vein plus parastigma 7.3 times longer than stigmal vein which is 5 times longer than stigmal vein in *cuspidigaster);* speculum closed (which is open below in *cuspidigaster). C. elmaellae* differs from both species in having scutellum distinctly longer than wide (that of both species as long as wide). The new species differs from *C. nephereus* by having pro-

podeum aluteceous, only finely-reticulated below Y-shaped median carina (fig. 8) (which is weakly sculptured and without median carina in *nephereus*): scutellum of male with deep, wide pits inside each scutellar bristle (that of female less deep) which have not been seen so deep pits in any specimen of other species of the genus (personel communication, in letter of Z. Boucek, May 10, 1978).

Sympiesis sericeicornis (Nees)

Synonyms :

Eulophus upupaenellae Bouche, 1834, Naturgesch.d.Insecten, p. 172 (syn. Boucek, 1959)

Eulophus sericeicornis Nees, 1834, Hym. Ichneum.affin. Monogr. 2:168 (in Boucek, 1959)

Entedon laticornis Ratzeburg, 1848, Ichneum.d.Forstins., 2:162 (in Boucek, 1959)

Sympiezus sericeicornis, Thomson, 1878, Hym. Scand., 5:217 (in Boucek, 1959)

Sympiezus punctipleura, Thomson, 1878, *Ibidem*, 5:218 (in Boucek, 1959)

Sympiezus lithocolletidis Brunn, 1883, Rep. N.Y. (Cornell) Agric. Expt Stn., Dept., Ent. 2:150 (Nomen nudum, Miller, 1970).

Metacolus conius Provancher, 1887, Add. Corr. Faune Ent. Canada, Hym., pp. 200-201 (Literature not seen). *New synonymy.*

Coccophagus compressicornis Provancher, 1887, *Ibidem*, p. 206 (Literature not seen). *New synonymy.*

Sympiesis nigrifemora Ashmead, 1888, Bull. Kans. agric. Exx. Stn. 3:app. p. VII. (Lterature not seen). *New synonymy.*

Sympiesis nigripes Ashmead, 1888, *Ibidem*, 3:app.p. VII. *New synonymy.*

Segripiesis nigrifemora Webster, 1895, Can. Ent. 27:68.

Sympiesis massasoit Crawford, 1913, Proc. U.S. nath. Mus. 45:258. (Syn. with S. *conica* (Prov.) by Miller, 1970). *New synonymy.*

Sympiesis feketei Györffy, 1939, Folia ent. Hung., 4:100 (syn. Boucek, 1959).

Sympiesis compressicornis Peck, 1951, in Muesebeck *et al.*, Agr. Monogr. (U.S. Dept. Agric.), 2:426.

Sympiesis conicus Peck, 1951, *Ibidem*, 2:426.

Sympiesis conica Miller, 1970, Men. Ent. Soc. Can. No. 68, p. 36.

Sympiesis nigripes Pottinger and LeRoux, 1971, *Ibidem*, No. 77, p. 81.

This European insect has been recorded under different names as a parasite of leaf-miners, *Lithocolletis malimalifoliella* Braun (Miller, 1970) and *L. blancardella*, and as a hyperparasite of *Apanteles orginis* Weed (Pottinger and LeRoux, 1971) in Canada and as a parasite of *Lithocolletis* spp. (Peck, 1951, 1963), and *L. crataegella* Clem. (Bekham *et al.*, 1950) in the U.S.A. Miller (1970) stated that *S. conica* could be separated from European *S. sericeicornis* by having the antero-dorsal angles of the first three funicular segments extremely elongated or, more commonly, barely to slightly aciculate, but Boucek (1959) showed that this was within the range of variation of *S. sericeicornis*.

Type specimens of *S. sericeicornis, S. conica, S. nigripes, S. nigrifemora,* and *S. compressicornis* in the CNC were studied and I concluded that all the specimens were conspecific; Dr. Boucek and Dr. Yoshimoto also examined the type specimens and agreed.

Sympiesis sericeicornis was the most important parasite of *P. elmaella* in the Vancouver district in 1977; in Haney 20 % of the host larvae were parasitized; in Burnaby from 1.2 to 1.4 % of the host larvae. It has at least three generations a year in those locations.

Sympiesis gordius (Walker)

Synonyms :

Eulophus Gordius Walker, 1839, Monogr. Chalciditum, 1 : 129.

Eulophus Alaparus Walker, 1839, Ibidem, 1 : 163.

Eulophus cervicornis Förster, 1841, Beitr. Monogr. Pteromal., p. 43.

Entedon padellae Ratzeburg, 1844, Ichneum. d. Forstins., 1 : 166.

Eulophus laevissimus Ratzeburg, 1848, Ibidem ,2 : 157.

Eulophus stramineipes Thomson, 1878, Hym. Scand., 5: 232.

Eulophus albiscapus Erdös, 1954, Ann. Hist. nat. Mus. Natl. Hung. 5: 327.

Eulophus padellae Delucchi, 1958, Entomophaga, 3: 259.

Dr. Boucek kindly examined two Canadian specimens and confirmed my identification. According to him, they agree well with type of *gordius* in British Museum (Nat. Hist.), London.

Specimens reared : British Columbia, CANADA : New Westminster, 1 female, 12. VII. 1978, Doğanlar; Burnaby, 1 female, 1. 1. 1978 (Laboratory rearing), Doğanlar.

Distribution : British Columbia, Canada (new nearctic records for the species); Central and Northern Europe ,Afghanistan (Boucek, 1959).

Biology : Reared from mines of *P. elmaella* on apple and crabapple in the Vancouver district, British Columbia. The parasitism is about 1.2 - 2.0 % of the host larvae.

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The author wishes to thank Dr. Z. Boucek for his comments and suggestions, and Dr. C. M. Yoshimoto for helping in identification of the specimens, for the use of the collections and types from the Canadian National Collection, and for much valuable information that was provided the author while he was studying at the CNC; and Prof. B. P. Beirne and Professor T. Finlayson for their comments, suggestions and assistance during the preparation of this work. The author also thanks Dr. A. Mutuura for identifying the lepidopterous specimens.

Özet

Batı Kanada'dan **Chrysocharis** Foerster cinsine bağlı iki yeni tür ile bu bölge için **Sympiesis** Foerster (Hym.; Chalcidoidea : Eulophidae) cinsine bağlı yeni bir kayıt ve sinonimleri.

Vancouver bölgesi (British Columbia, Kanada)'nden **Chrysocharis (Nesomyia) yoshimatoi** sp.n. ve **C. (N) elmaellae** sp.n. isimlendirilip tanımlanmıştır. **Sympiesis conica** (Prov.), **S. compressicornis** (Prov.) **S. nigripes** Ashm. ve **S. massasoit** Crawf'in, bir Palearctic tür olan **S. sericeicornis** (Nees)'in synonym'i olduğu saptanmış ve **Sympiesis gordius** (Walker) Kuzey Amerika'da ilk olarak bulunmuştur. Parazitlerin hepsi **Malus** spp. yapraklarından toplanan **Phyllonorycter elmaella** Doğanlar and Mutuura (Lepidoptera : Gracilariidae) tırtıllarından elde edilmiştir.

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