

***Stenomalina rufigaster* sp. n. from a pine bog in southern Finland (Hymenoptera, Chalcidoidea: Pteromalidae)**

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A new species, *Stenomalina rufigaster* sp. n., is described based on females and males found in Suurisuo, a bog in Janakkala, southern Finland. The female is easily separated from all other species of the genus in having mostly yellowish red gaster. 13 females and 7 males have been captured mainly in July and August in 1979–1993 in the pine marshy area of the bog. The new species is compared with the closely similar *S. micans* (Olivier). The biology of the new species is unknown.

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1. Introduction

The species of the *Stenomalina*-group of Pteromalidae (Hymenoptera: Chalcidoidea) were revised by Graham and Claridge (1965). The known species of the three genera of the group, *Stenomalina* Ghesquière, *Chlorocyrtus* Graham and *Isocyrtus* Walker, are entomophagous parasitoids of stem-feeding hosts.

The fauna of Finnish *Stenomalina* is poorly known. Hedqvist (2003) reported 13 species of the genus from many provinces in Sweden. Of these only 6 species have been recorded from Finland: *S. epistena* (Walker), *S. favorinus* (Walker) (Vikberg 1982), *S. gracilis* (Walker) = *S. muscarum* auct. (Forsius 1925), *S. illudens* (Walker) (Koponen & Vikberg 1984) = *S. crassicornis* (Thomson) (Thuneberg 1959), *S. liparae* (Giraud) (Valkeila 1956), and *S. micans* (Olivier) = *S. varians* auct. (Thuneberg 1959).

I have collected parasitoid wasps in the neighborhood of Turenki, Janakkala in South Häme,

southern Finland since 1974. One of my favorite localities has been the bog Suurisuo which is located some 15 km towards Lammi. The peat and vegetation of this peat land has been studied e.g. by Ruuhijärvi (1979). In the area of the bog Suurisuo I have reared *Stenomalina liparae* from galls of *Lipara lucens* Meigen and *L. pullitarsis* Daskocil & Chvála (Diptera: Chloropidae) on *Phragmites australis*. In that bog, another striking species of *Stenomalina* has been found repeatedly in bog parts with pines (*Pinus sylvestris*). This species is described as new to science in this article.

2. Material and methods

The terminology of body parts follows those of Graham (1969) and Gibson (1997). The microscopy technique is the same, and the measurements were made as explained in Vikberg (2011).



Fig. 1. *Stenomalina rufigaster* sp. n., holotype female, lateral view. Body length 2.5 mm. Photograph by Pekka Malinen.

The following abbreviations are used:

- POL: Postocellar line, measured as the distance between the inner margins of the lateral ocelli.
- OOL: Ocello-ocular line, measured as the distance between the outer margin of one lateral ocellus and the inner margin of the compound eye of the same side.
- OD: Ocellar diameter, measured as the maximum width of one lateral ocellus.

3. Description of *Stenomalina rufigaster* sp. n.

Type material. Holotype female: 6.VIII.1993, Finland, South Häme: Janakkala, Suurisuo, EUREF grid 67634:83815, leg. V. Vikberg (sweep net), coll. Zoological Museum, University of Helsinki, Finland. Paratypes: 1 ♀ 10.VII.1979, 1 ♂ 20.VI.1980, 1 ♀ 24.VII.1980, 1 ♀ 1.VIII.1981, 1 ♀ 6.VIII.1981, 1 ♂ 14.VII.1984, 2 ♂♂ 1 ♀ 13.VII.1991, 1 ♂ 1 ♀ 4.VIII.1991, 2 ♀♀ 20.VIII.1991, 1 ♂ 2.IX.1991, 1 ♂ 1.VII.1993, 2 ♀♀ 1.VIII.1993, 1 ♀ 4.VIII.1993, 1 ♀ 6.VIII.1993, swept from the same locality as the holo-

type, but labeled with uniform grid reference 6766:3381, leg. V. Vikberg (sweep net), coll. Zoological Museum, University of Helsinki and coll. V. Vikberg, Turenki, Finland.

Diagnosis. The female of *Stenomalina rufigaster* sp. n. can be identified from other species of the genus by the following combination of characters: 1) gaster mostly reddish yellow, 2) small size (body length 2.05–2.5 mm), 3) malar space slightly less than half the length of an eye. The male of *S. rufigaster* sp. n. is characterized by 1) head in exact dorsal view only 1.7 to 1.8 as broad as its maximum length, 2) gaster with a distinct, large reddish yellow spot, and 3) small size (body length 1.95–2.4 mm).

Description. Female holotype (Fig. 1).

Colouration. Head dark blue. Eye pale, slightly zinober. Ocelli amber red. Mandibles reddish brown, palpi brown. Scape reddish brown, apically slightly infusate. Pedicel dark, with metallic tint. Flagellum dark, brownish to blackish. Mesosoma dark blue, with greenish metallic tint especially laterally and on propodeum, coxae concolorous with mesosoma. Legs otherwise yellowish red, fore femur greenish infusate, hind tibia and tarsus brownish yellow,



Fig. 2. *Stenomalina rufigaster* sp. n., paratype female, dorsal view. Body length 2.3 mm. Photograph by Pekka Malinen.

with apical tarsomere brownish infuscate. Wings slightly fumate. Gaster yellowish red, tergum 1 with greenish tint, 3–4 caudal terga dark, with bronze tint.

Head. With strong reticulate sculpture, somewhat dull. In dorsal view 1.83 times as broad as long, temples converging rather strongly, about 0.21 as long as the eyes. POL/OOL index 1.7; OOL/OD 1.8. Malar space 0.42 the height of an eye or 0.47 of the width of the mouth. Anterior margin of antennal torulus slightly closer to the median ocellus than to the anterior margin of the clypeus. Scape 0.79 times as long as height of an eye, reaching above top of vertex; combined length of pedicel and flagellum 1.16 times width of head; flagellum slightly clavate; first funicular segment as long as pedicel, 1.7 times as long as broad, second and third segments distinctly longer than broad, fourth segment slightly longer than broad, fifth segment subquadrate and sixth segment slightly transverse; clava with divisions between its segments transverse; its third segment, ventrally, produced 0.4 towards base of clava and provided with a rather small patch of micropilosity which is constricted near apex.

Mesosoma. With strong reticulate sculpture, somewhat dull. Scutellum 1.23 times as long as broad, moderately convex. Propodeum medially 0.59 as long as scutellum, its median area with rather strong, nearly uniform, dense reticulation;

median carina irregularly wrinkled. Legs stout; hind femur 3.7 times as long as high in lateral view; hind tibia 6.7 times as long as apically wide; spur of mid-tibia 0.8 times as long as basitarsus. Fore wing 2.5 times as long as broad; basal fold with 3 hairs; marginal vein 2.0 times as long as stigmal vein; postmarginal vein slightly shorter than marginal vein.

Gaster. Broadly ovate, 1.57 times as long as broad; ovipositor sheath in dorsal view concealed. Apex of hypopygium at level 0.56 of the length of the gaster.

Measurements (length in mm, if not stated otherwise). Body 2.5. Head: length 0.40, width 0.73, height 0.63. Scape 0.30. Eye: height 0.38, width 0.30. Distance between eyes on frons 0.45. Mesosoma: length 1.10, width 0.56, height 0.62. Fore wing 1.95. Hind leg: coxa 0.36, femur 0.57, tibia 0.70, tarsus 0.49. Gaster: length 1.08, width 0.69, height 0.50.

Variation in females. Length of body 2.05–2.5 mm. Fore wing: marginal vein/stigmal vein 2.0–2.1; basal fold with 1–7 setae. A paratype female, collected on 10.VII.1979, shown in Fig. 2.

Male (paratype on 20.VI.1980) (Fig. 3).

Colouration. Head dark blue. Scape brownish yellow, apically above infuscate; pedicel brown, with greenish tint; flagellum dark brown. Mesosoma blue green, coxae blue green. Legs yellowish red, mid- and hind tibiae and tarsi more yel-



Fig. 3. *Stenomalina rufigaster* sp. n., paratype male, dorsal view. Body length 2.3 mm. Photograph by Pekka Malinen.

low; fore trochanter white. Wings slightly infumate; venation dark brownish. Gaster: terga 1–2 reddish yellow, tergum 1 anteriorly broadly infuscate, with green tint; terga 3–6 dark bronze, tergum 7 bright green.

Head. In dorsal view 1.78 times as broad as long. POL/OOL index 1.9; OOL/OD 1.5. Malar space 0.44 the height of an eye or 0.48 of the width of the mouth. Anterior margin of antennal torulus slightly closer to the median ocellus than to the anterior margin of the clypeus. Scape 0.76 times as long as the height of an eye, reaching slightly above the top of the vertex, anteroapical margin of scape with a shiny boss which extends 0.63 of the length of the scape; combined length of pedicel and flagellum 1.76 times the width of the head; flagellum rather narrow, clava 1.25 times as broad as width of pedicel in dorsal view;

first funicular segment 3.4 times as long as broad.

Mesosoma. 2.1 times as long as wide. Scutellum 1.29 times as long as broad, moderately convex. Propodeum medially 0.69 as long as scutellum, its median area with rather strong reticulation; median carina irregularly wrinkled. Fore wing 2.4 times as long as broad; marginal vein 1.86 times as long as stigmal vein. Hind femur 3.8 times as long as high in lateral view. Gaster 2.3 times as long as wide.

Measurements (length in mm, if not stated otherwise). Body 2.3. Head: length 0.36, width 0.67, height 0.56. Scape 0.26. Eye: height 0.34, width 0.26. Distance between eyes on frons 0.42. Mesosoma: length 1.10, width 0.53, height 0.54. Fore wing 1.78. Hind leg: coxa 0.33, femur 0.53, tibia 0.66, tarsus 0.51. Gaster: length 0.98, width 0.43, height 0.23.

Variation in males. Length of body 1.95–2.4 mm. Head in dorsal view 1.7 to 1.8 times as wide as maximally long.

Biology. The biology is unknown. All specimens have been swept in the southern area of the bog Suurisuo, Janakkala in the middle of the summer in July and August, one male in late June and one male in early September.

Etymology. The specific epithet *rufigaster* is derived from Latin *rufus* red, reddish and Greek *gaster* stomach. The mostly reddish yellow female gaster is a unique character in the whole genus.

Remarks. Using the keys to females of the species of *Stenomalina* in Graham and Claridge (1965) and in Graham (1969) the females of the new species run in both keys to the couplet 13 and there the characters partly fit species indet. A (antennal toruli nearer to the median ocellus than to the anterior margin of the clypeus) or *S. micans* (Olivier) (malar space slightly less than half the length of an eye; pronotal collar weakly margined). Obviously the last mentioned species is the most similar named species of the genus with *S. rufigaster* **sp. n.** Therefore, some characters of the females of *S. micans* are compared below with those of the new species.

Females of *S. micans* are larger as their body length is given 2.8–4.2 mm in Dzhankmen (1978). Graham in Graham and Claridge (1965) gave some characters of the female of *S. micans* in the key to the species, and he figured the clypeus (fig. 9), the head in dorsal view (fig. 21), the antenna (fig. 18) and the clava (fig. 16) of the female.

Two females of *Stenomalina micans* were reported in early May 1976 from Janakkala and Hämeenlinna by Vikberg (1982). They were rechecked now and were found to be misidentified; they belong to *S. epistena* (Walker).

One female of *S. micans* was swept on 16 August 1975 in South Häme: Hattula, Parola (6775:3356) by Vikberg (1982). It fits the characters and the figures of *S. micans* in the work of Graham and Claridge (1965), and it was used for comparison with the new species. The characters of *S. rufigaster* **sp. n.** females are given in parentheses. The body length of this female of *S. micans* is 2.9 mm (*vs.* 2.05–2.5 mm). Head and mesosoma are green (*vs.* dark blue, mesosoma

with greenish tint laterally and on propodeum). Wings are clear (*vs.* slightly fumate). Femora are mostly dark, with greenish metallic tint (*vs.* yellowish red, fore femur greenish infuscate); mid- and hind tibiae and tarsi are pure yellow (*vs.* mid-tibia and mid-tarsus yellowish red, hind tibia and tarsus brownish yellow, with apical tarsomere brownish infuscate). Gaster with tergum 1 is bright green, following terga are green with broad purplish transverse stripes apically (*vs.* gaster mostly yellowish red, tergum 1 with greenish tint, 3–4 caudal terga dark, with bronze tint). Head in dorsal view is 2.0 (*vs.* 1.8) times as broad as long. Anterior margin of antennal torulus is slightly nearer to anterior margin of clypeus than to median ocellus (*vs.* slightly closer to the median ocellus than to the anterior margin of the clypeus). Propodeum with median carina is almost straight (*vs.* irregularly wrinkled). Gaster is 2.0 (*vs.* 1.6) times as long as broad.

In the key to males of *Stenomalina* species by Graham and Claridge (1965), the male of the new species will run to the couplet 7 and *S. fontanus* (Walker). This is interesting, because the female of that species is not known for certain, but it is possible that *S. fontanus* is a junior synonym of *S. micans* (Graham in Graham & Claridge 1965: 279, 281). In the original description of *Pteromalus fontanus* by Walker (1839: 262), some colour characters do not fit the new species, e.g. antenna is black, scape and pedicel green, basally fulvous, and femora are green, apically yellow.

4. Discussion

Although the biology of the new species is not known, it may be a useful approach to assume something similar as in similar other species. The closely similar species, *Stenomalina micans*, has been reared as a parasitoid of *Chlorops pumilionis* (Bjerkander) (Diptera: Chloropidae) in Moldova (Bouček 1961) and in Sweden (Graham & Claridge 1965: 280). Kurdjumov (1913), who figured the larva and redescribed the adult (as *Stenomalus micans*), reared it as an external parasite of the larva of *Meromyza saltatrix* Meigen (Diptera: Chloropidae) in stems of wheat (*Triticum aestivum* L.) in Russia. Kearns (1931) stated that the species (as *Stenomalus micans*) has two

generations in England, the first generation attacks the larvae of *Chlorops taeniopus* Meigen on barley and the second generation attacks the larvae of the same species on couch grass (*Agropyrum repens* = *Elymus repens*), and the larvae of both the host and the parasitoid overwinter. He cited the publication of Frew (1923) when discussing on the host fly and described the five instars of the endoparasitic larvae and the pupa of the parasitoid. Because he did not describe the adult wasp, it is not clear, which species of *Stenomalina* was really studied (Graham & Claridge 1965). In addition, according to Nartshuk and Andersson (2013) the frit flies in the cited papers were misidentified and the correct name for *Chlorops pumilionis* and *C. taeniopus* should be *Lasiosina herpini* (Guérin-Ménéville), and for *Meromyza saltatrix*, *M. nigriventris* Macquart. Both these chloropid species are also found in southern Finland.

The species of *Stenomalina* overwinter either as adult females or in the larval stage (Graham 1969). Of Finnish species, the females of *S. gracilis* and *S. epistena* hibernate. Before and after hibernation, a swarm of females of *S. gracilis* appears sometimes in old houses, particularly on windows and ceilings (Graham & Claridge 1965). I have observed such swarms many times in southern Finland. *Stenomalina liparae* overwinters in the larval stage and the species has one generation per year with adults in early summer. Apparently *S. rufigaster* sp. n. has one generation in later summer and it overwinters in the larval stage.

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References

- Bouček, Z. 1961: Notes on the chalcid (Chalcidoidea) fauna of Moldavian SSR. — Trudy Moldavskogo nauchno-issledovatel'skogo Instituta Sadovodstva, Vinogradarstva i Vinodeliya 7: 5–30.
- Dzhanokmen, K. A. 1988: Family Pteromalidae (Pteromalids). — In: Medvedev, G. S. (Editor-in-Chief), Keys to the insects of the European part of the USSR Volume III Hymenoptera Part II: 88–411. Oxonian Press Pvt. Ltd., New Delhi, xii + 1341 pp.
- Forsius, R. 1925: Über einige durch Zucht erhaltene Schlupfwespen aus Finnland. — Meddelanden af Societas pro Fauna et Flora Fennica 49(3): 62–69.
- Frew, J. G. H. 1923: On the larval anatomy of the gout-fly of barley (*Chlorops taeniopus* Meig.) and two related Acalyprate Muscids, with notes on their winter host plants. — Proceedings of the Zoological Society of London 93(4): 783–821.
- Gibson, G. A. P. 1997: Chapter 2. Morphology and terminology. — In: Gibson, G. A. P., Huber, J. T. & Woolley, J. B. (eds), Annotated keys to the genera of Nearctic Chalcidoidea (Hymenoptera): 16–44. NRC Research Press, Ottawa, Ontario, Canada, xi + 794 pp.
- Graham, M. W. R. de V. 1969: The Pteromalidae of north-western Europe (Hymenoptera: Chalcidoidea). — Bulletin of the British Museum (Natural History) Entomology Suppl. 16: 1–908.
- Graham, M. W. R. de V. & Claridge, M. F. 1965: Studies on the *Stenomalina*-group of Pteromalidae (Hymenoptera: Chalcidoidea). — Transactions of the Royal Entomological Society of London 117(9): 263–311.
- Hedqvist, K.-J. 2003: Katalog över svenska Chalcidoidea. Catalogue of Swedish Chalcidoidea. — Entomologisk Tidskrift 124(1–2): 73–133.
- Kearns, H. G. H. 1931: The larval and pupal anatomy of *Stenomalus micans* Ol. (Pteromalidae), a chalcid endoparasite of the gout-fly of barley (*Chlorops taeniopus* Meig.), with some details of the life history of the summer generation. — Parasitology 23(3): 380–395.
- Kurdjumov, N. V. 1913: Notes on Pteromalidae (Hymenoptera, Chalcidoidea). — Russkoe entomologicheskoe Obozrenie 13: 1–24.
- Nartshuk, E. P. & Andersson, H. 2013: The Frit Flies (Chloropidae, Diptera) of Fennoscandia and Denmark. — Fauna Entomologica Scandinavica 43 (2012): i–vi, 1–282.
- Ruuhijärvi, R. 1979: Suurisuo mire complex, Janakkala, Finland. Lammi Biological Station, University of Helsinki 1979. [www document]. URL <http://www.helsinki.fi/lammi/elibrary/elibrary.html>. (Site visited on 10 April 2012)
- Thunberg, E. 1959: Ein kleiner Beitrag zur Kenntnis der Schlupfwespen Finnlands. — Notulae Entomologicae 39: 323–324.
- Valkeila, E. 1956: *Lipara lucens* äkämistä ja niiden asukkaista. Über die *Lipara lucens* – Gallen des Schilfes und deren Bewohner. — Annales Entomologici Fennici 22(2): 98, 102.
- Vikberg, V. 1982: Additions to the chalcid fauna of Finland (Hymenoptera, Chalcidoidea). — Notulae Entomologicae 62: 129–142.
- Vikberg, V. 2011: *Torymus ventralis* (Fonscolombe) and *Torymus maculatus* sp. n. from Finland, and *Torymus maculosus* sp. n. from Corfu, Greece (Hymenoptera: Chalcidoidea: Torymidae). — Entomologica Fennica 22(3): 149–156.
- Walker, F. 1839: Monographia Chalciditum. 1. 333 pp. London.