Redescription and biology of *Trichosia* (*Baeosciara*) *sinuata* Menzel & Mohrig (Diptera: Sciaridae)

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Vilkamaa, P. & Komonen, A. 2001: Redescription and biology of *Trichosia* (*Baeosciara*) *sinuata* Menzel & Mohrig (Diptera: Sciaridae). — Entomol. Fennica 12: 46–49.

Trichosia (*Baeosciara*) *sinuata* Menzel & Mohrig, previously known only from the holotype from Austria, is redescribed and its biology discussed. Individuals of the species were reared from an old-growth forest bracket fungus *Fomitopsis rosea* (Alb. & Schw.:Fr.) P. Karst from eastern Finland. We suggest that *B. sinuata* might be parasitised by the ichneumonid wasp *Stenomacrus curvulus* (Thomson).

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Received 20 December 1999, accepted 17 October 2000

1. Introduction

Menzel & Mohrig (1997) described *Trichosia* (*Baeosciara*) *sinuata* in their revision of the Palearctic species of *Trichosia* Winnertz (Menzel & Mohrig 1997, Mohrig & Menzel 1997). New material of the species reared from fruiting bodies of *Fomitopsis rosea* (Alb. & Schw.:Fr.) P. Karst (Polyporaceae) led us to the conclusion that the species needed to be redescribed. In general, the state of the classification of Sciaridae is far from satisfactory, many of the current genera are obviously not monophyletic (Vilkamaa 2000). At the species level, identification is often difficult because high-quality revisions and identification keys are lacking. The phylogenetic and taxonomic problems regarding the *Trichosia* group of genera, including *Baeosciara* Tuomikoski, are neglected here and will be discussed by PV in a later paper.

The details of the biology of Sciaridae are poorly known (*see* Steffan 1981). The larvae live mostly in soil and litter, under the bark of trees or in the sporocarps of fungi. The material of *B. sinuata* collected from bracket fungi shows an interesting habitat choice of a sciarid species and suggests a rarely documented case of a host-parasite relationship between a sciarid fly and an ichneumonid wasp species, *Stenomacrus curvulus* (Thomson).

2. Material and methods

Baeosciara sinuata was reared from the fruiting bodies of an old-growth forest bracket fungus *Fomitopsis rosea* from eastern Finland. The perennial *Fomitopsis rosea* lives on fallen trunks of Norway spruce (*Picea abies*), and its fruiting bodies may last for several years with new hymenia produced every year. The fruiting bodies are typically less than 7 cm wide and 3 cm thick. The distribution of the fun-

gal species is circumboreal in coniferous forests (Ryvarden & Gilbertson 1994).

In total, 514 fruiting bodies of *F. rosea* were collected from Kuhmo (20 study sites) in eastern Finland in the middle boreal zone (Ahti *et al.* 1968), and from Häme (2 study sites) in central Finland in the middle and southern boreal zone. All the study sites are old-growth spruce swamp forests. Some of the forest stands have been treated with selective logging of larger trees at the beginning of this century. The forest stands have retained a multi-aged structure of trees with many fallen and standing decaying trunks. The forest stands are mesic, mostly *Myrtillus*-type (Cajander 1949) spruce-dominated forests with paludified patches where *Sphagnum* spp. dominate the forest floor. In sampling, dead or dying fruiting bodies with visible marks of insect damage were preferred. Insects were reared from the fruiting bodies by placing the fruiting bodies into cloth-covered plastic boxes, which were then kept sheltered in outdoor conditions.

For the taxonomic treatment, the specimens were mounted on microscope slides in Euparal after dehydrating them in absolute ethanol. The morphological terminology follows Hippa & Vilkamaa (1991). The taxonomic study is mainly based on the males because the females lack diagnostic characters. The material studied is deposited in the Zoological Museum, Finnish Museum of Natural History, Helsinki (ZMH) and in Deutsches Entomologisches Institut, Eberswalde (DEI).

3. Results

3.1. Biology

Fourteen males and twenty females of *Baeosciara sinuata* emerged from 24 June to 15 July 1998 from thirteen fruiting bodies sampled between 23–28 May in the same year (Table 1). The number of individuals per fruiting body ranged from 1 to 7 (mean = 2.6). Because all the sampled fruiting bodies were checked for insects before they were placed into the rearing boxes, the rearing took place in the closed boxes, and as such a high number of *B. sinuata* individuals emerged, it is highly unlikely that these individuals could have been accidental ones resting or feeding on the fruiting bodies. Based on this evidence, it is likely that these individuals were feeding in the fruiting bodies as larvae and emerged during the rearing. Such a development of Sciaridae inside fruiting bodies of bracket fungi has previously been reported only in the case of *Peyerimhoffia oxyura* Edwards from Sumatra (Edwards 1931) and *Bradysia giraudi* (Schiner) from Europe (Tuomikoski 1960). However, sciarid flies have been reported to be associated with several bracket fungus species (Yakovlev 1994) but no detailed studies on species host use have been conducted. The level of host specificity of *B. sinuata* was not investigated but its specialisation on *F. rosea* seems unlikely as such a low number of fruiting bodies were occupied by the species. However, a closely related bracket fungus *Fomitopsis pinicola* hosts a different sciarid fauna (Yakovlev 1994). Because of the limited taxonomic knowledge, many sciarid flies reared from various fungal species have probably been left undetermined and therefore it is highly speculative to talk about the level of host specificity.

We also suggest that *B. sinuata* might be parasitised by the parasitoid wasp *Stenomacrus curvulus* (Hymenoptera: Ichneumonidae). *Stenomacrus* species are known to parasitise dipteran larvae (Reijo Jussila and Veli Vikberg, pers. comm.), and all sixteen individuals of *S. curvulus* were reared from the same fruiting bodies as *B. sinuata* individuals. Moreover, no other potential host species emerged from the fruiting bodies. As we have only indirect evidence, this potential host-parasitoid observation should be treated with caution but as only few parasitoids are known to parasitise sciarid flies our observation is interesting

Table 1. Study sites from which *Baeosciara sinuata* individuals were reared.

Location	Coordinates	Fruiting bodies collected	*B. sinuata* individuals
Kn: Kuhmo, Issakka	7091:3653	34	21
Kn: Kuhmo, Elimyssalo	712:366	45	3
Kn: Kuhmo, Honkavaara	7090:3632	35	6
Kn: Kuhmo, Louhivaara	7089:3630	23	2
Kn: Sotkamo, Urpovaara	7089:3602	36	1
Kn: Kuhmo, Rajalampi	7088:3633	30	1

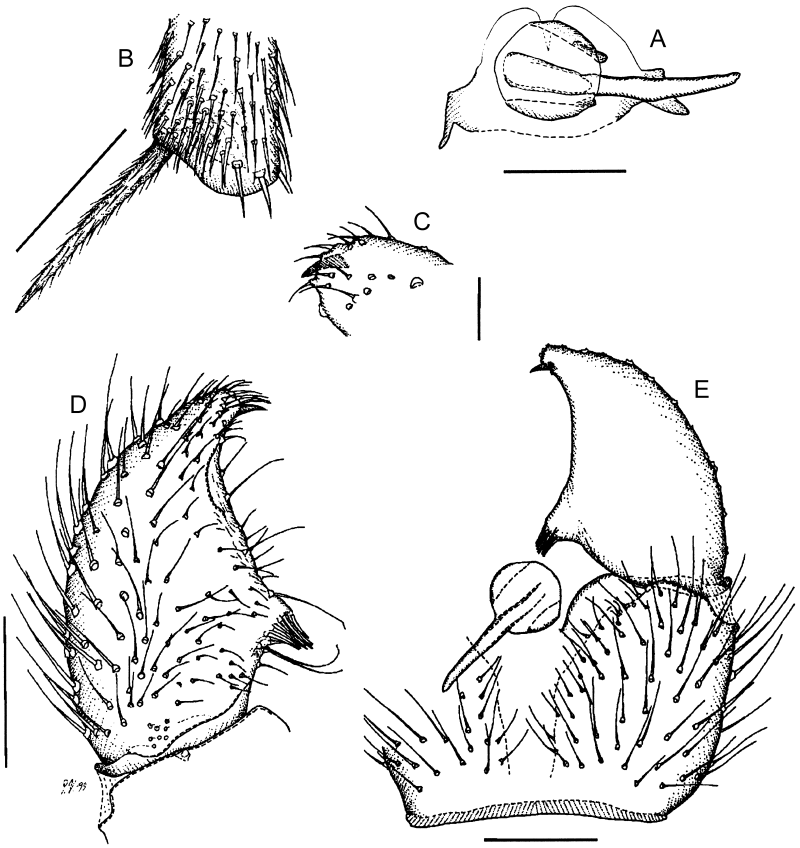

Fig. 1. *Trichosia* (*Baeosciara*) *sinuata* Menzel & Mohrig (A, B, D and E from Finland, C holotype): aedeagus (A), ventral view, apical part of front tibia (B), prolateral view, part of hypopygium (E), gonostylus (D) and apex of gonostylus (C), ventral view. Scales for A, C = 0.05 mm, for B, D, E = 0.1 mm.

and worth mentioning. Tuomikoski (1957) observed that *Trichosia caudata* (Walker) was parasitised by the proctotrupid *Acropiesta flaviventris* Thomson.

3.2. Redescription

Material examined. Holotype ♂: AUSTRIA, Steiermark, Hochalm bei Leoben, subalpin, Sam. Nr. X 1192b, leg. Franz (DEI). Other material: FINLAND, Kn, Kuhmo, 13 ♂, 20 ♀, Kn, Sotkamo, 1 male, leg. A. Komonen. (MZH); (for details see the text and Table 1).

Diagnosis. Medium-sized, brown. Wing veins M and Cu with dorsal setae, hind margin of wing with dorsal and ventral setae. Tegmen small, genital rod and lateral parts of tegmen strongly sclerotized. Gonostylus with apical tooth, with 15–20 slender mesial megasetae on distinct medial-subbasal lobe, and with five flagellate setae.

Description. Male. Head. Eye bridge with 4 rows of facets. Prefrons with 14–24 setae. Antennal flagellum short, flagellomeres with short pale setosity, with short necks, length/width of flagellomere 4 ca. 1.70. Maxillary palp with three segments, segment 1 with 5–7 setae, sensillae scattered on dorsal side. Thorax. Darkish brown. Anterior pronotum with 6–15 setae, episternum 1 with 7–10 setae. Dorsal margin of katepisternum slightly angulate. Pleural pit just at the anterior part of margin. Wing. Hyalinous. Length 2.0–2.8 mm. Anal lobe well developed. c/w 0.50–0.75, R1/R 1.30–1.55. r-m, stM, M1, M2, Cu1 and Cu2 with dorsal setae. Hind margin with dorsal and ventral setae. Legs. Pale brown. Front tibia with some ventral and retrolateral spinose setae. Length of front basitarsomere/length of front tibia 0.55–0.60. Front tibia subapically with prolateral patch of setae (Fig. 1B). Abdomen. Pale brown. Hypopygium (Fig 1A, C, D and E). Gonostylus with dorsomesial apical tooth.

Female. Wing. Brownish. Length 2.5–3.3 mm. Only the holotype has been known up till now.

The above description of the male is largely based on the Finnish material, many characters of the holotype being rather difficult for us to see. Although there is no doubt of the conspecifity of the females and males (similar colouration, setosity of wing veins, chaetotaxy of legs, strictly sympatric occurrence), we could not find any diagnostic characters in the female, and we are not sure whether the females alone could be identified with certainty.

The following points of the original description of Menzel & Mohrig (1997) need to be modified. (1) The gonostylus has a sharp apical tooth. (2) There are megasetae (in the sense of Hippa & Vilkamaa (1991)) only in a medial-subbasal lobe of the gonostylus but not in the apical part of gonostylus (both called 'Dornen' by Menzel & Mohrig (1997)). The apex of the gonostylus bears basally slightly thickened, sharp setae, similar to those occurring in various sciarid groups (e.g. in *Bradysia*, *Prosciara*, *Dolichosciara*, some current *Corynoptera*). (3) There are five, not only one, flagellate setae on the mesial side of the gonostylus, three apicad and two basad of the gonostylar lobe (Fig. 1D).

Menzel & Mohrig (1997) stated in their original description that the gonostylus does not have the apical tooth. However, the tooth is visible at least on the right gonostylus of the holotype, in the preparation strictly on the dorsal side of the gonostylus (Fig. 1C). The new material shows that the apical tooth is actually on the dorsal mesial margin of the gonostylus, near its apex (Fig. 1D).

B. sinuata differs from the other other two known species of *Trichosia* (*Baeosciara*) *sensu* Menzel & Mohrig (1997) by having the apical tooth and a mesial lobe with numerous slender megasetae on its gonostylus. *B. pusillima* (Frey) has stout megasetae all over the mesial side of its gonostylus, whereas *B. scotica* (Edwards) has only two slender megasetae on a mesial lobe and one short megaseta subapically on its gonostylus. Superficially, *B. sinuata* resembles some species of the *Dolichosciara ruficoxa* (Brunetti) group (*see* Vilkamaa, 2000) and a group of species of *Prosciara* Frey (*P. contigera*, *P. decamera*, *P. meracula*, *P. ferulifera* and *P. filichaeta*; *see* Hippa & Vilkamaa 1991 and Vilkamaa & Hippa 1996). All of these have a medial-subbasal group of slender megasetae on their gonostylus. The species of *Dolichosciara*, as well as *Prosciara ferulifera* and *P. filichaeta*, have also (like *B. sinuata*) setose wing veins M and Cu. *B. sinuata* can easily be distinguished by its much shorter antennal flagellomeres and their necks, shorter maxillary palp, shorter legs with short front basitarsomere, subbasal prolateral modified setae on the front tibia in a group (Fig. 1B), not in a comb, and by having flagellate setae and above all, the apical tooth on the gonostylus.

Acknowledgements. We thank Dr. Frank Menzel (Eberswalde) for the loan of the type of *Baeosciara sinuata*.

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