

***Leucopis formosana* Hennig (Diptera, Chamaemyiidae) - synonymy, distribution, food links**

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It has been found out that *Leucopis formosana* Hennig has one of the most extensive distribution area among Chamaemyiidae, stretched from Israel and Western Africa up to Australia. Redescription, synonymy, taxonomic position, distribution and mode of life are given.

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Introduction

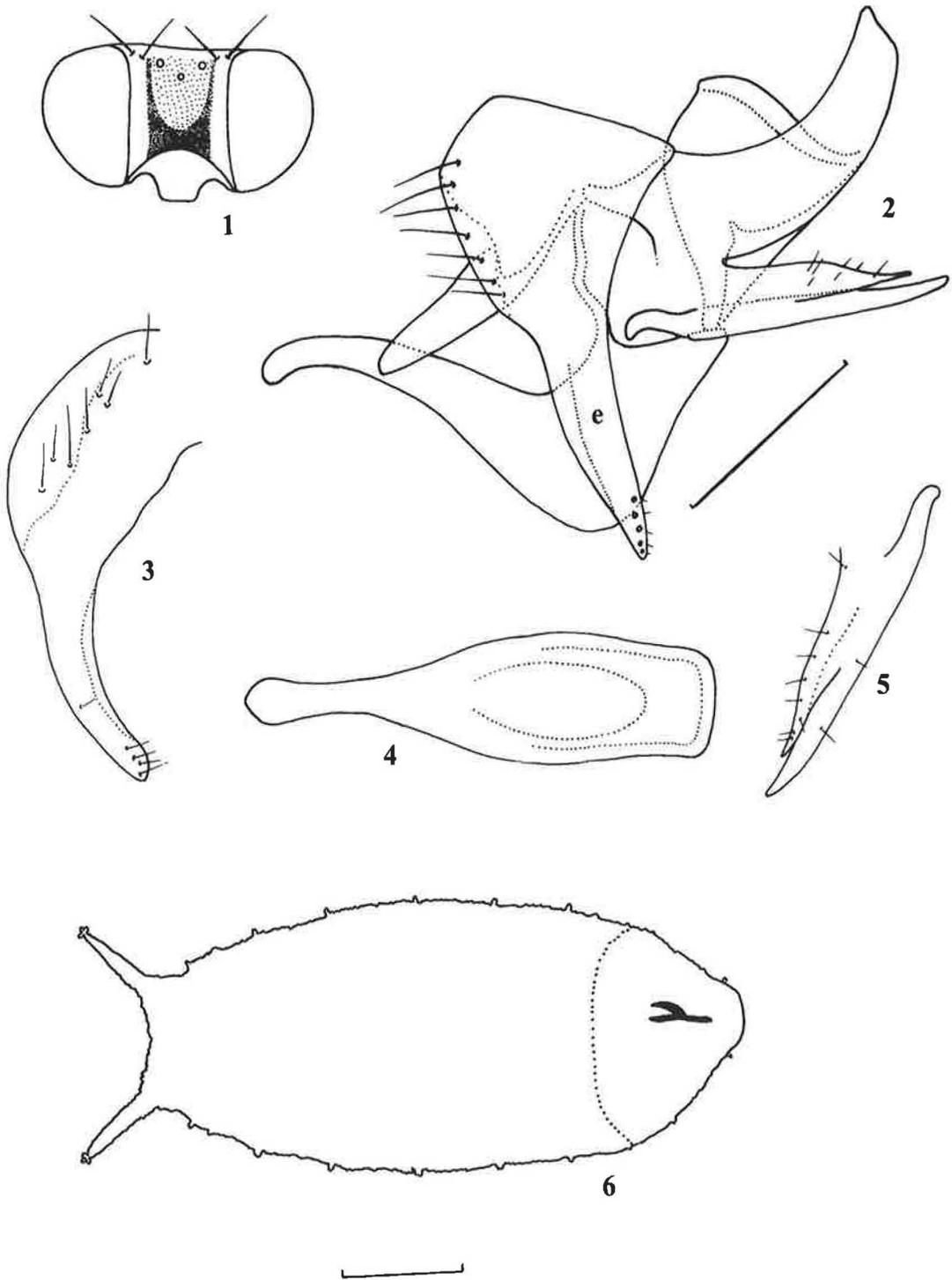
Most species of the large genus *Leucopis* occur in the limited areas of the Palaearctic or Nearctic, with some spread to nearby areas possible (Tanasijtshuk, 1996). Some species like *L. glyphinivora* Tanas., which preys on more than 70 species of aphids, and *L. argenticollis* Zetterstedt, predator on species of *Pineus* and *Adelges*, are found throughout the Holarctic and even the Indian part of Palaeotropic, respectively. The number of holarctic species is likely to grow as a result of progressive studies of nearctic species. Only *L. argentata* Heeger appears to have worldwide distribution coinciding with the distribution area of *Hyalopterus pruni* (Geoffr.). It is noteworthy that this species preys on its victim only on *Phragmites australis*, never touching it on Prunoidea (Tanasijtshuk 1997). It has recently been realized that *Leucopis formosana* has a much wider distribution than what its name indicates. This paper deals with its redescription, data of synonymy, taxonomic position, geographic distribution, and mode of life.

***Leucopis formosana* Hennig, 1938**

Hennig, 1938: 209; Tanasijtshuk, 1986: 231; 1996: 59; Beschovski & Merz, 1998:98. - *lubrica* Frey, 1958: 29 (*Leucopomyia*), syn. nov.

Male, female. Body length 1.5 - 2.3 mm. Body light grey.

Head. 1.6-1.75 times higher than long. Frons (Fig. 1) widened anteriorly, it is 2.5-2.7 times narrower than the head. Orbits silvery-white. Ocellar plate drop-shaped, large, grey, almost at the same level with the frons surface; two dark stripes fused above lunule, enveloping the ocellar plate. Anterior ocellus sometimes smaller than posterior ones. OT index (ratio of the distances between posterior ocelli and between any posterior ocellus and the anterior one) 1.5-1.8. Lunule moderate, arc-shaped. Antennae and arista black; 2nd arisal segment 3.0-4.5 times less than 3rd. Cheek height 3.5-4.5 times less than eye height. A row of few minute bristles present on each cheek; the fore bristle is noticeably larger than the others. Palpi black.



Figs. 1-6. *Leucopis formosana* Hennig: 1. Head, dorsal view; 2. genitalia, lateral view (e - edite) (scale = 0.1 mm); 3. epandrium with edite; 4. phallus, ventral view; 5. parameres, ventral view; 6. puparium (scale = 0.5 mm).

Mesonotum. Colour of lateral stripes vary from golden brownish to grey with faint brown shade; they are reaching the last pair of dc. Dark grey medial stripes sometimes reach the last third of mesonotum. Intervals between stripes usually without bristles. Two pairs of dorsocentral bristles. Legs black. Apices of femora and bases of tibiae yellow. First tarsomeres on fore legs yellow, but not always; mid and hind legs commonly lighter.

Wings. M and R 4+5 slightly converging in the second half; tp 1.4-1.6 times shorter than ultimate section of Cu.

Abdomen. Two rather small spots present on 3rd tergite. Grey elongated spots or faint touch may be present on 4-5 tergites. Elongated dark fields of modified microtrichia present on lower edges of 1+2 and 3rd tergites in males.

Male genitalia (Figs. 2-5). Epandrium with 6-8 bristles on each side behind; passage of epandrium into edites with noticeable constriction. Edites long, rather massive in basal part, slightly curved inside. Hypandrium smoothly widened backward, with narrow hind margin. Anterior parameres shorter than posterior ones, their apexes are sharp. Phallus, widened in basal half, narrow at base with rounded apex.

Puparium (Fig. 6). Light brown with dimensions ranging from 2.7 x 1.0 x 0.8 mm to 2.1 x 0.9 x 0.8 mm. Anterior spiracles with three stigmal openings each. Posterior spiracles fixed at thin and relatively long stalks (their length almost reaching 1/6 of the puparium length).

Taxonomic notes. When describing this species Hennig (1938) provided a drawing of genitalia allowing us to determine the species. Originally (Tanasijtshuk 1986) I used to think that this species was closely related to *L. steinbergi* Tanas. and was included in the group named after this species; now I believe that the species cannot be ascribed to the steinbergi group, since all species of this group prey on gall-making aphids and the species in question feeds on free living aphids. According to the genital structure *L. formosana* is very closely related to *L. compacta* Tanas., a transpalaeartic species of the annulipes group. That is the group *L. formosana* has to be related to.

The analysis of the types of *Leucopis* (*Leucopomyia*) *lubrica* Frey showed that the species described from Cape Verde Islands (Frey, 1958) is identical with *L. formosana*; it has the same external morphology and genitalia structure. It is necessary to mention that this species was incorrectly attributed to *Leucopomyia*. It has no prescutellar bristles which are a constant character of *Leucopomyia*; its genitalic structure is similar to *Leucopis* s.str., and its larvae do not feed on coccids, as *Leucopomyia* larvae do.

Distribution. The species considered occurs from East Mediterranean to Australia. It was found in Israel (Beschovski & Merz, 1998), on the Cape Verde Islands (Frey, 1958), in Côte d'Ivoire, Republic of South Africa, Tanzania, Kenya, on Reunion Island, in Oman, in India (Mysore, Bangalore), People's Republic of China (Kwangtung), Taiwan (Hennig, 1938), Vietnam (Hanoi, Vinh Phu, Khaton Bhin), Australia (all states and territories) (Tanasijtshuk, 1996).

Type material. Syntypes of *L. formosana*, 3♂ with label "Tainan, Formosa" preserved in Institut für Pflanzenschutzforschung, Eberswalde, Germany. Types of *L. lubrica* Frey preserved in Zoological Museum, University of Helsinki. Lectotype: ♀, Ins. Cabo Verde, Ilh. Rombos, Cima 27.03.1954 (Lindberg). Paralectotypes: 5♂, 5♀ with the same label; 1♀, Ins. Cabo Verde, S. Vicente, B.de Norte, 14.3.1954 (Lindberg); 1♂, 2♀, Ins. Cabo Verde, S. Lucia pr. Agua Doce, 3.12. 1953 (Lindberg); 2♂, Ins. Cabo Verde, Sol, Praia do Mte Grande 21-22.1.1954 (Panelius) and 25.1.1954 (Lindberg); 1♂, 2♀, Ins. Cabo Verde, Sol, Terra Boa, 21.1.1954 (Lindberg); 1♀, Ins. Cabo Verde, Boãvista, Fundo de Figueiras, 30.1. 1954 (Lindberg); 3♂, 1♀, Ins. Cabo Verde, Maio, Pedro Vaz, 3. 2.1954 (Lindberg). The specimen from Rib. Julião (S. Vicente) mentioned by Frey, is absent in the type series; in the series from Cima (Rombos) there are only 11 of 15 specimens, and in the series from Terra Boa (Sol) there are 3 of 4 specimens, mentioned by Frey in the original description.. However, 1♂ with label Ins. Cabo Verde, Antão, supra Porto Novo, 3.1.1954 (Lindberg) was not mentioned in Frey's paper.

Additional material. More than 250 specimens from Côte d'Ivoire, South Africa, Tanzania, Kenya, Reunion Island, Oman, India, China, Vietnam, Australia kept in the collections of Zoological Institute, (St.Petersburg, Russia), Tel Aviv University (Israel), Indian Station of Commonwealth Institute of Biological Control (Bangalore, India), CSIRO (Canberra, Australia), collection of Dr. S.Gaimari (nowadays at the National museum of Natural History, Washington). Specimens studied by Beshovski and Merz (1998) preserved in collection of B.Merz (Zürich).

Mode of life. The species has been reared from

the following aphids: *Aphis chloris* Koch on *Hypericum perforatum* var. *angustifolium* in Australia, Canberra in February (V.F. Eastop) (Tanasijtshuk, 1996). *Aphis craccivora* Koch on *Euphorbia hirta* in Reunion in November (Etienne). *Aphis gossypii* Glov. on *Bidens pilosa* in Australia, N.S. Wales in July (D.N.C.); on "tamarillo" (= tree tomato) in the same place in June (W.M. Milne) (Tanasijtshuk, 1996); on cotton in Côte d'Ivoire in February (Leclant); on cotton in India (Mysore, Bangalore) in May (Rao) (Tanasijtshuk, 1986); on *Capsicum anum conoides* in Vietnam in October (Than). *Aphis spiraeicola* Patch. (= *citricola* v.d.Goot) in Australia: on *Viburnum tinus* in Canberra in October (M.Carver); on pseudogalls on *Cassinia quinquefaria* near Canberra in March (M. Carver) (Tanasijtshuk, 1996). *Macrosiphum rosae* (L.) on rose in Australia, Adelaide (M. Carver) (Tanasijtshuk, 1996). *Myzus persicae* (Sulz.) on peach in South Australia in November (M. Carver) (Tanasijtshuk, 1996). Undetermined aphids on *Hybiscus sabdarifa* in Vietnam, Hanoi in November (Than).

It is possible that Pruthi and Bhatia (1938), describing the biology of "*Leucopis griseola*", an important predator of *Aphis gossypii* Glov. in India, dealt with a group of species, including that exact species. The real *Leucopis griseola* Fall. associated with aphid galls on *Ulmus*.

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