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ABSTRACT VOLUME
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Glycoconjugates, previously observed in the gut and on the surface of the mouthparts, are shown to be of exogenous origin, to be associated with particulate food, and possibly to render food particles self-agglutinating. This latter quality is important to larvae as it facilitates food acquisition.

Key words: Culicidae, Simuliidae, Aedes aegypti, Aedes implicatus, Culex territans, Anopheles earlei, Simulium vittatum, Gymnopais dichopticoides, glycoconjugate, histochemistry, moulting.

Gall midges (Cecidomyiidae) of the Neotropical region.

R.J. Gagné

An overview based on new research is given of the known gall midge fauna of the Neotropical region, comparing it to the fauna of the rest of the world and giving attention to new changes necessary in classification (e.g. a new, broader definition of Brachineurini) and to the endemic components (e.g. the new tribe Anadiplosini).

Key words: Cecidomyiidae, Neotropical, gall midges.

Morphology of the immature stages of Leucopis spp. (Diptera: Chamaemyiidae).

S.D. Gaimari
Department of Entomology, 320 Morrill Hall, 505 South Goodwin Avenue, University of Illinois, Urbana, IL 61801, USA.

Members of the genus Leucopis Meigen are all predators as larvae, on sternorrhynchous homopterans, such as aphids, scales, and
mealybugs. The present difficulties in identifying adult specimens point to a need for additional identification methods. I have found that characters of the immature stages are important, at least for separating species. In studies of three closely related species within the subgenus *Leucopis*, reliable characters were found to distinguish the species in all immature stages, including eggs, three larval instars, and puparia. Presented is a survey of some of these characters, which include those related to chorionic patterns of eggs, cephalopharyngeal skeleton morphology, and larval and puparial surface sculpturing. In the egg stage, the species could be differentiated at the gross morphology level based on patterns of longitudinal ridges, and at 10,000x magnification on the basis of the structure of pores in the chorionic latticework. In the larval stage, the species could be separated in any of the three instars. Among these three species, most larval body segments are each secondarily divided into three pseudosegments, which may have varying patterns of surface sculpturing. The most important characters include the size, density, definition, and contiguity of chaetoids (fleshy, seta-like projections of the integument) on these pseudosegments. As a single example of a distinguishing character: the third instar of *Leucopis ninae* has a transverse row of six chaetoids which are elongated and spinule-like on each of the middle pseudosegments, while those in both of the other two species are stubby and thick. Some of the characters presented may be important for studies involving classification of these flies, and matching immature stages with their respective adults is an important step towards understanding relationships within the chamaemyiids.

Key words: *Leucopis*, Chamaemyiidae, morphology, immature stages.

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Egg morphology of the Blondeliini (Diptera, Tachinidae).

S.P. Gaponov
Voronezh State University, Universitetskaya pl., I, 394 000 Voronezh, Russia.

The surface structure of the eggs of the following 9 genera of the
tribe Blondeliini (Tachinidae) was investigated using a scanning electron microscope: *Meigenia* R.-D., *Medina* R.-D., *Lecanipa* Rd., *Zaira* R.-D., *Istochaeta* Rd., *Oswaldia* R.-D., *Ligeria* R.-D., *Blondelia* R.-D. and *Compsilura* Bouché. The homogeneous, smooth, thin, transparent chorion is without a polygonal network, aeropyle and plastron surface in the eggs of *Ligeria*, *Blondelia*, and *Compsilura*. The dorsal chorion of *Meigenia*, *Medina*, and *Zaira* is arched, smooth and without a polygonal network. The aeropylar structure of the egg of *Meigenia* has 16-20 round cripts and is situated on the posterior egg pole. There are several single cripts with tubes from the inner layer of the chorion on the egg surface. The aeropylar zone of the egg of *Medina* is spiral-shaped and situated centrally on the anterior pole. There are 27-30 round cripts in the aeropylar zone. The aeropylar area of the egg of *Zaira* is situated asymmetrically on the anterior pole. It is divided into four groups of cripts. The eggs of *Oswaldia*, *Lecanipa*, and *Istochaeta* have a polygonal network and plastron surface. The hexagonal ridges of the egg of *Istochaeta* are arranged randomly, and the plastron surface is of the pit type. The aeropylar zone is situated on the anterior pole and consists of 8-16 cripts. The egg of *Oswaldia* has thin ridges with little hills. The bottoms of the hexagonal cells are reticulated with numerous plastron hills. There are two aeropylar zones, which are multiangular-shaped, situated on the egg poles. There are tiny teeth on the thick hexagonal ridges of the egg of *Lecanipa*. The bottoms of the hexagonal cells are reticulated with tiny teeth. Two aeropylar zones are situated apically on the anterior egg pole, and have clear raised borders.

Key words: Blondeliini, Tachinidae, plastron, chorion, aeropylar zone.

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Evaluation of the parasitoid Spalangia gemina for biological control of house fly: development rates and host attacks as a function of temperature.

C.J. Geden
USDA, ARS, Medical and Veterinary Entomology Research Laboratory, P.O. Box 14565, Gainesville, FL 32604, USA.

Spalangia gemina is a tropical pteromalid parasitoid of fly pupae that is under investigation for its potential use as a biological control agent against the house fly and other muscoid flies in animal agriculture systems. Development rate responses were studied as a function of temperature for S. gemina and compared with two indigenous house fly parasitoids, S. cameroni and Muscidifurax raptor. The Sharpe & DiMichele 6-parameter thermodynamic model of enzyme kinetics fit the data well when parasitoids were reared under constant temperatures. This model exaggerated high temperature inhibition, however, and further model refinements were required to predict development under fluctuating temperature regimes. House fly destruction by the parasitoids as a function of temperature was also examined. All three species showed high-temperature inhibition of host attacks at surprisingly low temperatures. Both Spalangia species also showed pronounced distortions in their sex ratios in response to temperature, with increasing proportions of males produced at higher temperatures. S. gemina was very similar to S. cameroni in all of the tests, and both of these closely-related Spalangia species had slower rates of development and host attacks than M. raptor.

Key words: Musca domestica, Muscidae, Spalangia gemina, biological control.