

First Record of a Crane Fly Larva (Diptera, Limoniidae: Chioneinae) from Baltic Amber

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ABSTRACT A description and illustration are given for a Chioneinae (Limoniidae) larva from Baltic amber. This is the first known larva of a crane fly in Baltic amber, and the first known fossil specimen of a Chioneinae larva. The specimen is identified as probably in the genus *Ormosia*. Possible habitats of this larva were damp mud or leaf litter along watercourses or in woodlands.

KEY WORDS Diptera, Limoniidae, crane fly, larva, Baltic amber

ADULT CRANE FLIES BELONGING to the family Limoniidae (=Tipulidae: Limoniinae; Byers 1992) are among the most abundant insect inclusions in Baltic amber (Weitschat and Wichard 1998), but fossil records of their larvae were unknown. During studies of amber inclusions belonging to The Academy of Natural Sciences, Philadelphia, PA, one crane fly larva was found. It is identified as belonging to the subfamily Chioneinae (=Eriopterinae; Stary 1992), and probably in the genus *Ormosia* Rondani, 1856. It is the first description of a fossil Chioneinae larva from any fossil material. Only one pupa belonging to the family Limoniidae was known previously from Baltic amber (Weitschat and Wichard 1998).

Description

Fossil larva of ?*Ormosia* sp.

Body length 8.1 mm; width 0.7 mm. Body cylindrical, covered with dense microscopic yellow hairs (Fig. 1), giving entire larva an overall golden color.

Head capsule is retracted into body and not visible.

Spiracular disc is surrounded by five fleshy lobes (Fig. 2), subequal in size and shape, length of each lobe almost 1.5 times as long as width at base. Each lobe roughly triangular in shape, with rounded apex. Apex of each lobe with short marginal hairs, these shorter at extreme tip and longer more laterally, hairs lacking along base of lobes. Lateral and ventral lobes with two weak sclerotized sclerites separated by a wide pale line; sclerites not reaching tips of lobes. Outer sclerite of each ventral lobe wider than inner; sclerites on lateral lobe subequal. Dorsal lobe with single weakly sclerotized sclerite, not reaching tip of lobe. Spiracles small, oval-shaped, inner circle light brown, the outer circle dark brown.

Anal field composed of a pair of white anal lobes or papillae, basal (central) part of the lobe more than twice as wide as apical (lateral) part.

Material examined included one larval specimen, The Academy of Natural Sciences, Invertebrate Paleontology Collection, ANSP 80109.

Discussion

The specimen is well preserved with the stigmal and anal fields of the last segment of the body distinctly visible. Unfortunately, the head capsule is retracted and does not allow for examination of most features. The five well-developed spiracular lobes clearly place the larva in the Limoniidae; lobe shape and number, orientation of spiracular disc, and lack of extended maxillary palps place it in the subfamily Chioneinae (Alexander and Byers 1981). There are 11 genera of this subfamily known from adults in Baltic amber: *Erioptera*, *Cheilotrichia*, *Ormosia*, *Tasiocera*, *Dicranoptycha*, *Rhabdomastix*, *Gonomyia*, *Gnophomyia*, *Trentepohlia*, *Toxorhina*, and *Styringomyia* (Evenhuis 1994). All these genera are known in the recent fauna, too. The larva of the genus *Tasiocera* is still unknown.

Because of the poor visibility of head capsule characters that are important in determining genera of Chioneinae, this larva does not key easily in current generic keys (Alexander and Byers 1981, Gelhaus and Byers 1994, Reusch and Oosterbroek 1997). Using the list of synapomorphic characters outlined by Oosterbroek and Theowald (1991) for the phylogeny of the Chioneinae, we can attempt to place the larva to genus. The five spiracular lobes (character 43), divided sclerites of the ventral and lateral spiracular lobes (characters 44 and 62), divided spiracular hair fringe (55), single anal papilla (47), and lack of a dark marking along inner margin of spiracles (57) and lack of an apical macroseta on the ventral spiracular lobe (58) place the larva in the *Ormosia* group of genera (*Scleroprocta*, *Ormosia*, and *Rhypholophus*). The shape and sclerotization of the spiracular lobes in the amber

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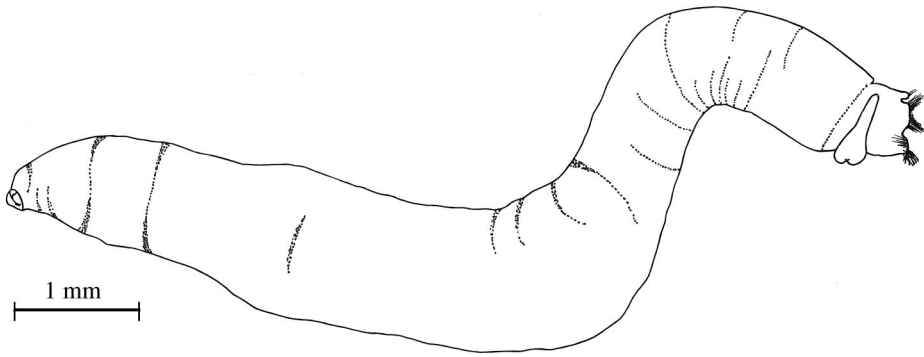


Fig. 1. General view of ?*Ormosia* sp. larvae.

specimen is not similar to that known for *Scleroptocta* and *Rhypholophus*.

The shape of the lobes and their pattern of sclerotization in this "amber" larva are most similar to that known for recent species of the genus *Ormosia*. Larvae of some species of *Ormosia* have two sclerites on the dorsal lobe, e.g., the palaeartic *Ormosia lineata* (Meigen, 1804) (Lindner 1959, Brindle 1967), but others, like this amber specimen, have a single sclerite, e.g., the nearctic *Ormosia meigenii* (Osten Sacken, 1859) (Alexander, 1920: Fig. 379). All three recent species of *Ormosia* whose larvae are known (Oosterbroek and Theowald 1991) belong to the subgenus *Ormosia*, but almost all species (9 of 10) described from Baltic amber belong to the subgenus *Oreophila* (Podenas 1999). It is impossible at this time to confirm the subgeneric identity of this larva.

Habitats

Larvae of the family Limoniidae generally spend their entire larval period inside substrate (Peus 1952), usually living only a few centimeters deep. This may explain why this specimen is the only crane fly larva yet to be found in amber. Larvae of the subfamily

Chioneinae, including *Ormosia*, usually develop in rich organic earth and mud along margins of water bodies (Savchenko 1986). They also can be found in masses of leaf litter and in wet spots in woods where humus is kept saturated (Alexander and Byers 1981). These wet substrates are not thought to have been in direct contact with viscous amber sites (Katinas 1971).

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References Cited

- Alexander, C. P. 1920. The crane flies of New York, part 2. Biology and phylogeny. Cornell University Agricultural Experiment Station, Memoirs 38: 691–1133.
- Alexander, C. P., and G. W. Byers. 1981. Tipulidae, pp. 153–190. In J. F. McAlpine, B. V. Peterson, G. E. Shewell, H. J. Teskey, J. R. Vockeroth, and D. M. Wood [eds.], Manual of Nearctic Diptera. Monograph 27, Research Branch, Agriculture Canada, Ottawa 1: 1–674.
- Brindle, A. 1967. The larvae and pupae of the British Cyclorotominae and Limoniinae (Diptera, Tipulidae). Trans. Soc. Br. Entomol. 17: 151–216.
- Byers, G. W. 1992. Crane flies - three families or one? Acta Zool. Cracoviensis 35: 37–41.
- Evenhuis, N. L. 1994. Catalogue of the fossil flies of the world (Insecta: Diptera). Backhuys Publishers, Leiden, The Netherlands.
- Gelhaus, J. K., and G. W. Byers. 1994. Tipulidae, chapter 19, pp. 438–458. In J. Morse [ed.], Aquatic insects of China useful for monitoring water quality. Hohai University Press, Nanjing, China.
- Katinas, V. 1971. Amber and amber-bearing deposits of the southern Baltic area. Trans. Lithuanian Sci. Res. Geol. Survey Inst. 20: 1–156.
- Lindner, E. 1959. Beiträge zur Kenntnis der Larven der Limoniidae. Zeitschrift Morphol. Ökol. Tiere 48: 209–319.
- Oosterbroek, P., and B. Theowald. 1991. Phylogeny of the Tipuloidea based on characters of larvae and pupae (Diptera, Nematocera) with an index to the literature except Tipulidae. Tijdschr. Entomol. 134: 211–267.
- Peus, F. 1952. Cyclorotomidae. In E. Lindner [ed.], Die Fliegen der palaearktischen Region, 3, Lief. 169.

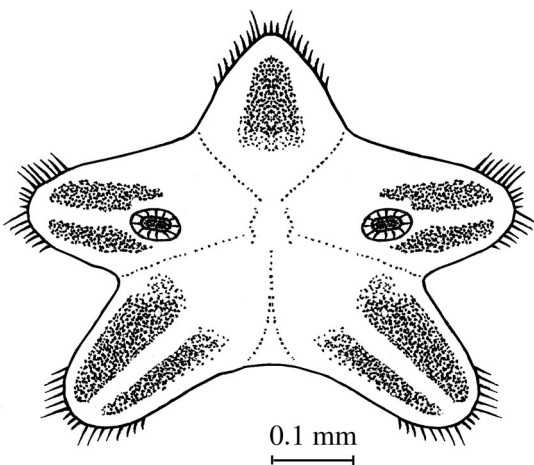


Fig. 2. Spiracular field of ?*Ormosia* sp.

- Podenas, S. 1999. *Ormosia rondani* crane flies (Diptera, Limoniidae) from the Baltic amber. *Acta Zool. Lithuanica* 9: 183–200.
- Reusch, H., and P. Oosterbroek. 1992. Diptera Limoniidae and Pediciidae, short-palped crane flies. In *Aquatic insects of North Europe. A taxonomic handbook* 2: 105–132.
- Savchenko, E. N. 1986. The limoniid-flies. *The fauna of the Ukraine* 14: 1–340.
- Stary, J. 1992. Phylogeny and classification of *Tipulomorpha*, with special emphasis on the family Limoniidae. *Acta Zool. Cracoviensis* 35: 11–36.
- Weitschat, W., and W. Wichard. 1998. *Atlas der Pflanzen und Tiere im Baltischen Bernstein*. Dr. Friedrich Pfeil Verlag, München, Germany.

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