

## A new genus and species of Ricaniidae from Palaeocene deposits in North Dakota

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A fossil tegmen of a species of Fulgoroidea, sent for identification to the writer by Dr. Donald Baird, of the Department of Geology, Princeton University, was found to represent a new genus and species in the family Ricaniidae, and these are described below. Dr. Leo J. Hickey, Visiting Research Associate of the Smithsonian Institution, U.S. National Museum, Washington, has kindly supplied the following details about the site where the specimen was obtained.

The wing occurred 11 to 12 ft below the Hebron-Dickinson member contact of the Late Palaeocene to Early Eocene Golden Valley Formation, in a sequence of fine-grained, parallel-bedded silky kaolinitic clays that are inferred to have been deposited in a small lake or pond. The fossil plants found in association with the wing included species of *Metasequoia*, *Cercidiphyllum*, *Quercus*, *Platanus* and *Acer*. The Golden Valley Formation is a predominantly fluvialite sequence, 180 ft thick, consisting of clays, silts, lignites and micaceous sands, and occurs as scattered remnants in an area of 13 000 square miles in the western part of North Dakota. It conformably overlies the Palaeocene Fort Union Formation and is in turn unconformably overlain by the Oligocene White River Group. The writer is greatly indebted to Dr. Baird and Dr. Hickey for the opportunity of studying this most interesting specimen.

The fossil consists of a cast of the ventral surface of a tegmen from the right side of the body (fig. 1). A small deep triangular impression between the base of vein Cu 1 and the claval suture has evidently been made by a triangular lobe that was set obliquely to the undersurface. Such a lobe, sometimes triangular, sometimes flange-like or rounded, sometimes vertical, or oblique, or even adpressed to the surface to which it is basally attached, is found in all existing species of the Nogodinidae and Ricaniidae. There is no sign of the presence of granules between M and Cu near their base, the basal cell is broad, veins Sc and R emerge from it at the same point, and M and Cu do so separately. This combination of characters is also found in Nogodinidae and Ricaniidae.

There are not many genera in either family that have tegmina shaped like that of the fossil. In the majority of those that do, the basal cell is relatively elongate and Cu 1 tends to lie close to the claval suture, though not invariably, and the triangular lobe on the margin of the basal cell is attached all the way from the claval suture to the base of M, or at least as far as a point between Cu 1 and M. In a very few genera the basal cell is broad, Cu 1 is remote from the claval suture, and the triangular lobe is attached only between the suture and

the base of Cu 1. The genera that have been found to have such a tegminal structure are members of the Ricaniidae, and it is this fact that provides the ground for referring the present fossil to this family.

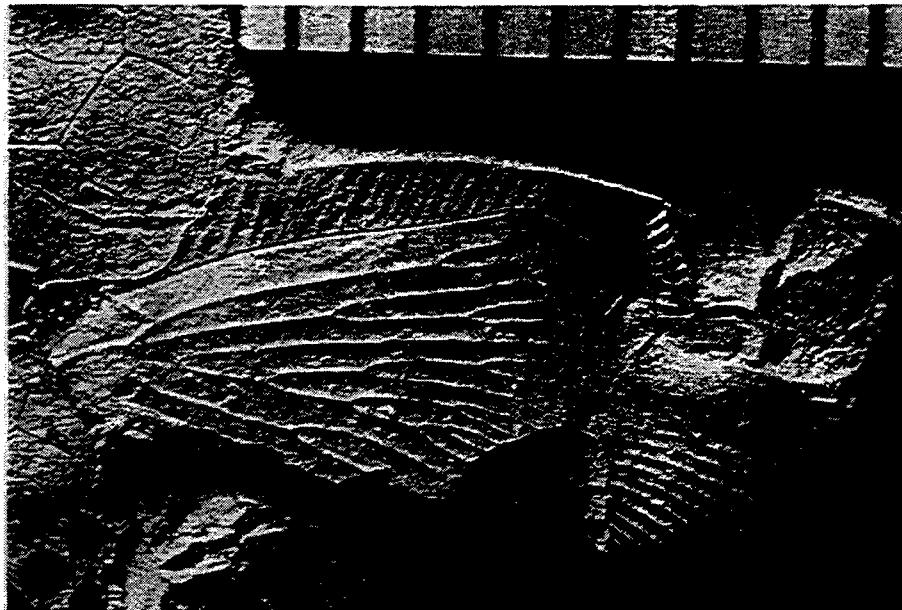


FIG. 1. *Cotradechites lithinus* gen. et sp. nov. Cast of ventral surface of right tegmen. (Photograph by Dr. Donald Baird.)

Family RICANIIDAE Stål  
COTRADECHITES gen. nov.

Ricaniidae with tegmina fully twice as long as broad, anterior margin shallowly convex, apical margin shallowly convex, oblique, apical angle apparently deeply rounded, sutural angle very obtusely rounded; costal area broader at middle than costal cell at same level, transverse veinlets dense, oblique; basal cell about 1·5 times as long as broad, Sc and R leaving cell at same point, M simple at base, leaving cell not quite midway between R and Cu 1, forking soon after leaving basal cell, Cu 1 simple basally and remote from claval suture, forking distally; distal venation regular, dense, cells elongate, bounded basally by a regular line of transverse veinlets parallel to apical margin; transverse lobe on basal cell extending only between Cu 1 and claval suture.

Type species, *Cotradechites lithinus* sp. nov.

*Cotradechites lithinus* sp. nov.  
(Figs. 1 and 2)

Tegmen longer than broad (2·1 : 1), costal area at middle wider than costal cell (1·5 : 1), its transverse veinlets simple or forked, Sc forking a little before node, R forked at about two-fifths from base of tegmen, M forked at about one fifth from base of tegmen, with its first sector simple to nodal line, and its second sector forked at about one quarter from base, Cu 1 forked at about one third from base; about 30 cells adjoining apical margin between apex of R and apex of claval suture, each cell in M about five times as long as broad, several

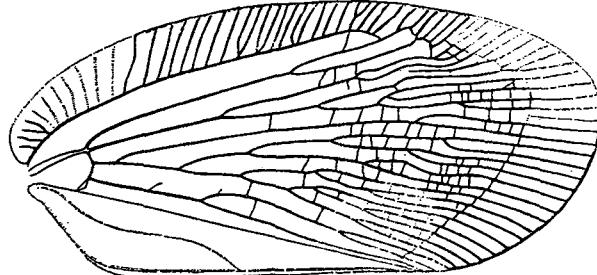


FIG. 2. *Cotradechites lithinus* gen. et sp. nov. Tegmen, with suggested restoration of venation shown in broken line.

irregular series of weak transverse veinlets across tegmen between node and apex of clavus, basal half of tegmen practically devoid of transverse veinlets; M-Cu cross-vein apparently about two-fifths from base, R-M cross vein only slightly more distad.

Length, 12.5 cm.

Holotype, fossil of right tegmen, Golden Valley Formation, 11 to 12 ft below top of lower member, lower gray zone; latest Paleocene; clay pit on Telephone Tower Hill, 5 miles east of Dickinson, Stark Co., North Dakota, NW  $\frac{1}{4}$  NE  $\frac{1}{4}$ , Sec. 4 T.139N, R95W (Leo J. Hickey). (PU888-93) in Museum of Natural History, Princeton, New Jersey.

The appreciable amount of variation in the position of the forks of the main veins found between specimens of the same species in recent Ricaniids has suggested the advisability of describing those actually found on the type as being only approximately indicative of the average position in the species.

Such variation was allowed for when comparisons were made with modern species.

*Cotradechites* can be separated from such 'narrow-winged' Ricaniid genera as *Carmentalia*, *Armillistrium*, *Deferundata*, *Neoprivesa*, and *Dechitus* by the short basal margin of the triangular ventral lobe of the basal cell, as well as by other characters, and from *Scolypopa*, *Semestra*, *Cotrades* and *Pochazoides* by the

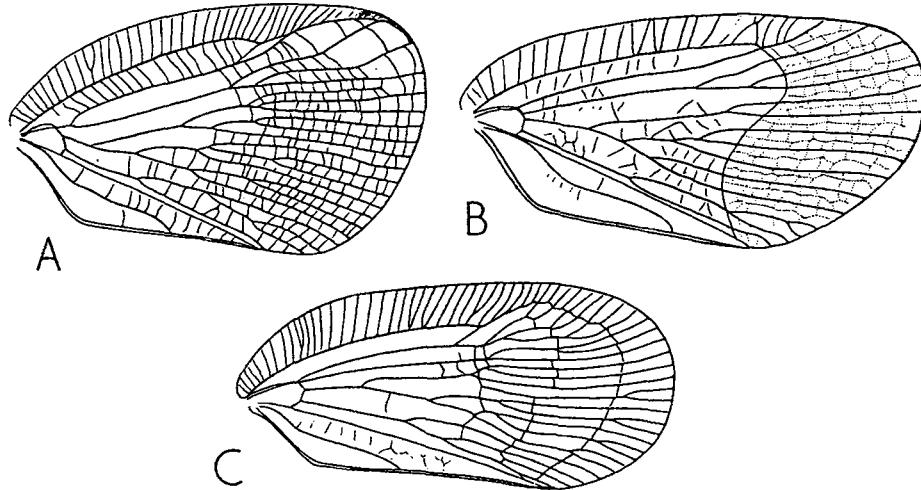


FIG. 3. A, *Cotrades intricata* Walker, right tegmen. B, *Semestra bugabensis* (Fowler), right tegmen. C, *Dechitus aphrophoroides* Walker, right tegmen.

combined characters of a broad, densely veined costal area and numerous elongate apical cells. In the writer's opinion *C. lithinus* is closest to species of the tropical American *Semestra* and *Cotrades*, which are themselves closely related. Both have a basal cell and triangular lobe similar to that of the present species, and tegmina which, but for minor specialisations, are basically the same in venational structure (examples of these are shown, for purpose of comparison, in fig. 3, A and B). A broad costal area with dense venation, such as found in *C. lithinus*, is not common in 'narrow-winged' Ricaniids; an example (*Dechitus aphrophoroides* Wlk.) is shown in fig. 3, C. This figure serves also to illustrate the elongate form of the basal cell that is usual in this group of Ricaniidae.

#### Summary

A new genus and species, *Cotradechites lithinus* Fennah, are proposed for a fossil tegmen of a Ricaniid (Homoptera : Fulgoroidea) collected in clay deposits of Latest Palaeocene age near Dickinson, North Dakota. The new genus is considered to be most nearly related to the modern tropical American genera *Cotrades* and *Semestra*.