AN ODONATE FOSSIL WING
FROM THE OLIGOCENE OF OREGON

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I am indebted to Professor Frank M. Carpenter for generously delegating to me the task of describing an interesting odonate wing from the Eugene Formation of the middle Oligocene of Oregon. The specimen was collected by Mr. Chester W. Washburne in 1900 and is one of the insects mentioned by Washburne in his account of the geology of the Eugene Formation.

The specimen, which consists of a complete fore wing, is contained in a tuffaceous mudstone, a medium which makes for wonderful preservation of even the most minute details of venation; only the middle third of the space between the nodus and the pterostigma is damaged but this is just the part which is of the least importance and which can be restored with a minimum of error. The actual outlines of the wing are so intact that both the length and breadth can be given with the greatest accuracy. The wing belongs to a species of the family Epallagidae and with a few adjustments, might well be placed in the genus *Euphaea* Selys. The fossil, which consists of obverse and reverse impressions, is deeply stained a dull warm brown, agreeing in this respect with fragments of leaves and plants among which the wing had come to rest; thus I am of the opinion that this apparent pigmentation is only the result of staining or some later chemical reaction. This opinion is supported by a broad apical dark band which is present on the reverse impression but absent on the obverse; on the latter a convex crack runs across the apex of the wing and a tracing made of this served to show that

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it corresponded exactly with the curved outline of the dark apical band.

Order ODONATA, Suborder Zygoptera
Family Epallagidae
Genus Litheuphaea nov.

Venational characters of the wing similar to those of genus Euphaea Selys, differing only as follows: Nodus situated rather more basally (although the level of this differs within limits in both subgenera and species of Euphaea; the present specimen conforms in this respect most closely to Anisophaea Fraser); pterostigma much larger than in any recent species of Euphaea, very acute proximally, as in many species of the Megapodagriidae, and fusiform in shape, followed by two rows of cells distally between the costa and radius; discoidal cell entire and very short in view of the length of the wing; anal-vein, 1A, extending beyond the level of nodus; anal field immediately posterior to the discoidal cell made up of three rows of cells (only a single row at this level in Euphaea), the rows of cells separated by an irregular zigzagged vein which is evidently a vestigial recurrent anal-vein (absent or entirely vestigial in Euphaea but becoming strongly developed in the more recent Agriidae. (In this respect, the new genus establishes a link between the Epallagidae and Agriidae.) Other characters are as follows: Antenodals numerous and with their costal and subcostal portions in strict alignment; Rii not approximated nor confluent with the radius at its origin; Riii in continuation with the sub-nodus; longitudinal veins rather flat and not curved abrupt-

![Fig. 1. Drawing of fore wing of Litheuphaea carpenteri n. sp.](image)
ly towards the wing border near their terminations, excepting CuP which is strongly convex and 1A which is markedly sinuous; four or more cubital cross-veins, two of which traverse the subdiscoidal cell and one of which forms its base. Medio-anal link very strongly developed and a conspicuous feature of the wing.

Type species of the genus, *Litheuphaea carpenteri* sp. nov.

**Litheuphaea carpenteri** sp. nov.

Fig. 1

Fore wing 34 mm in length; nodus situated 12 mm from base of wing; greatest breadth of wing 10.5 mm at level of distal end of anal vein. Pterostigma 5.15 mm. Antenodals 37; postnodals 50 ca. Two rows of cells between Rii and Riii beginning quite near the subnodus; intercalaries numerous; reticulation close. Anal vein highly convex and with a maximum of nine rows of cells between it and the border of wing; 2A strongly developed distal to the anal-link.

Above the impression of the wing, at about the central point of the antenodal portion of the wing, is to be seen a deep impression, in the bottom of which, in the obverse impression is the distinct outline of the lower jaw, so that it is evident that the impression represents the head of the insect upside down. The formation of the jaw is entirely similar to that of *Euphaea* with the median fissure as deep as half or more of the jaw and the palps of the same length and rounded outwardly. The impression of the rest of the head is to be seen only vaguely.

This species agrees with *Epallage* by the entire discoidal cell; with *Euphaea* by the position of the nodus, whilst the development of the anal field proximal to the level of the anal-link is found only in the recent *Dysphaeo gloriosa* Fraser from Laos (Siam).

Holotype: Museum of Comparative Zoology, No. 4895ab, from the Eugene Formation (middle Oligocene), 3 miles north of Goshen, Oregon, collected by C. W. Washburne.
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