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THE EVOLUTIONARY HISTORY
OF NEMATODES –
as revealed in stone, amber and
mummies

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Fig. 157. Adult (arrow) of *Palaeodiplogaster brentiphila** adjacent to its brentid weevil host, *Dominibrentis leptus* Poinar 2009 in Dominican amber (Ron Cauble collection). (Scale bar = 960 μ m.)

third-stage juveniles of some diplogastrids, typified by *Eudiplogaster aphodii* Bovien, 1937, develop in the haemocoel of dung beetles (Bovien, 1937; Poinar *et al.*, 1976). However, when these nematodes eventually emerge from the adult beetles they are larger than *S. minuta**.

Another group of flies in the Dominican amber forest that bred in decaying organic matter were the milichids (Diptera: Milichidae). The biology of these small flies is largely unknown but it is obvious that some in the Dominican amber forest served as hosts for mermithid nematodes. The mermithid *Heydenius dipterophilus** is adjacent to an apparent milichid in Dominican amber (Fig. 180). The nematode had completely emerged from the host, and it would probably have had

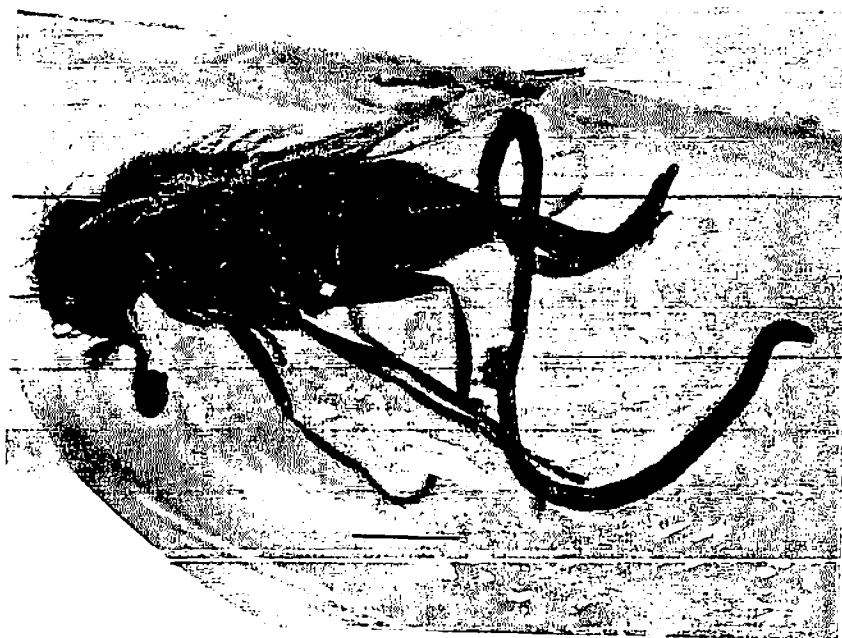


Fig. 180. Parasitic juvenile of *Heydenius dipterophilus** adjacent to its fly host in Dominican amber (accession no. N-3-66). (Scale bar = 425 μ m.)

was obviously still active enough to escape from the plant tissue. The finely annulated cuticle, pointed head bearing a stylet, obese, curled body, and conoid tail with a peg-like tip align the nematode with the anguinids (Plate 24A).

Under natural conditions the female would have developed into an immobile reproductive sac filled with juveniles. Anguinid juveniles are well known for their ability to withstand desiccation and can survive for years in dried seed and leaf galls (Fortuner & Maggenti, 1987). While the identity of the seed cannot be determined, it may be from a grass, since bamboo seeds occur in Dominican amber (Poinar & Judziewicz, 2005).

A number of predatory beetles occur in Dominican amber and some are attacked by mermithid nematodes. An unusual discovery was a mermithid that had emerged from an adult firefly in Dominican amber (Figs 209, 210; Plate 24B). There was only a single specimen of *Heydenius lamprophilus**, but it was large, measuring slightly over 14 mm in length. The size of mermithids is usually correlated with the size of their hosts and the number of parasites present. In general, mermithids

DESCRIPTION

Head and tail rounded; completely emerged specimen 1.3 mm in length and 80 μm in diam. $a = 16$; specimen partly in host 1.2 mm in length and 63 μm in diam.

COMMENTS

The specimen emerging from the fly leaves no doubt about the parasitic association. As far as could be determined, there are no extant reports of mermithids parasitising gall gnats.

TYPE MATERIAL

Specimen (accession no. N-3-53) deposited in the Poinar amber collection maintained at Oregon State University.

TYPE HOST

A female gall gnat (length 917 μm) (Diptera: Cecidomyiidae).

TYPE LOCALITY

Baltic region some 40-50 mya.

ETYMOLOGY

The specific name reflects the host family (Cecidomyiidae).

Heydenius dipterophilus n. sp.
(Fig. 180)

The species is based on a single mermithid that completely emerged from and is still adjacent to an acalyprate fly in Dominican amber.

DESCRIPTION

Head and tail rounded, length 4.4 mm; diam. 100 μm ; $a = 44$.

COMMENTS

The fly host is tentatively identified as a member of the family Milichidae. There are no extant records of mermithids from this family of flies.

TYPE MATERIAL

Deposited in the Poinar amber collection (accession no. N-3-66) maintained at Oregon State University.

TYPE HOST

A tentative member (length 2.5 mm) of the family Milichidae.

TYPE LOCALITY

Amber mines located between Santiago and Puerto Plata in the Cordillera Septentrional of the northern portion of the Dominican Republic.

ETYMOLOGY

The specific name is composed from the host order (Diptera) and the Greek word 'philia' for love.

***Heydenius dominicus* Poinar, 1984** (Figs 213-215; Plates 26, 27)

Two mermithids adjacent to an adult mosquito in Dominican amber.

DESCRIPTION (modified from Poinar, 1984a)

Head blunt, truncated. Specimen 1 (with single coil): length 3.35 mm, diam. 50 μ m, a = 68; length terminal tail appendage, 69 μ m. Specimen 2 with double coil: length 3.41 mm; diam. 50 μ m, a = 68; tail appendage composed of a proximal acute portion and a terminal filiform portion.

COMMENTS

A third specimen of *H. dominicus* was coiled in the abdomen of a mosquito (*Culex* sp., length 4.3 mm) in a second piece of Dominican