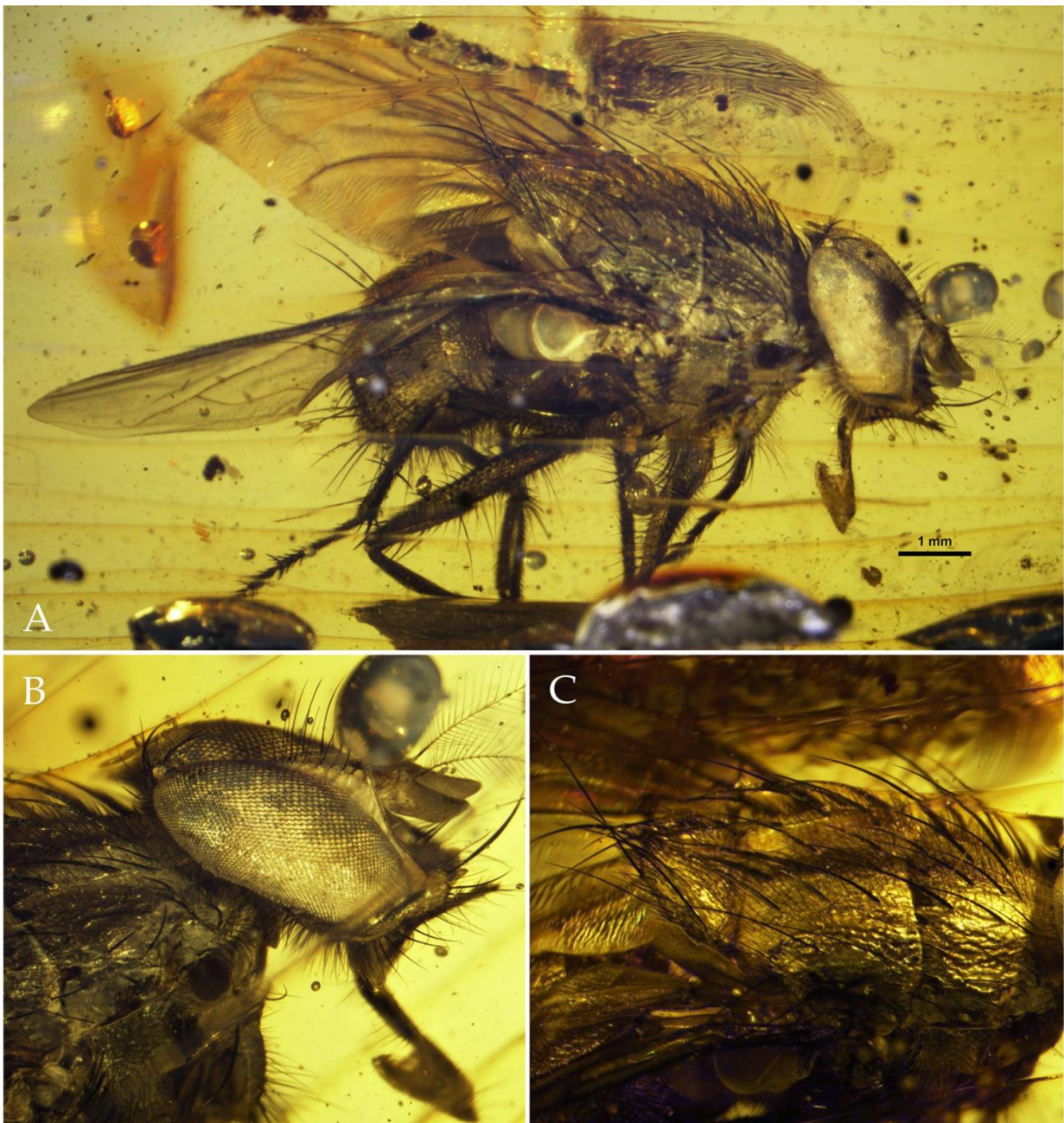


New fly fossil sheds light on the explosive radiation of flies during the Cenozoic Era

August 23 2017



Holotype of *Mesembrinella caenozoica* sp. nov. Credit: Cerretti et al (2017)

The first unambiguous fossil from the botfly family adds to the few known fossils of a major clade of flies (Calypttratae), shedding light on their rapid radiation during the Cenozoic Era, according to a study published August 23, 2017 in the open-access journal *PLOS ONE* by Pierfilippo Cerrito from Sapienza Università di Roma, Italy, and colleagues.

The bot fly family (Oestroidea) is the most diverse group of calypttrate [flies](#), which is a clade of some 22,000 living species that comprise about 14% all flies. Calypttrates arose during the Cenozoic, in what was the most rampant radiation of flies ever and among the largest radiations of insects during this era. The clade includes some of the most diverse and ecologically important families of flies: tsetse, louse, and bat flies; house flies and relatives; and blow flies, bot flies, flesh flies, and relatives. Abundant in most terrestrial ecosystems, calypttrates often play key roles as decomposers, parasites, parasitoids, vectors of pathogen vectors, and pollinators. However, there are few reliable calypttrate fossils.

Cerretti and colleagues describe the first unambiguous oestroid fossil: a new species of fly (*Mesembrinella caenozoica*) discovered in amber from the Dominican Republic. The researchers also used the few known calypttrate fossils as calibration points for a molecular phylogeny to estimate the timing of major radiations in this clade.

The researchers estimate that the most recent common ancestor of today's calypttrate flies lived about 70 million years ago—that is, just before the Cretaceous-Paleogene boundary; that the radiation of

oestroids began about 50 million years ago; and that the family *M. caenozoica* belongs to (*Mesembrinellidae*) originated about 40 million years ago. Importantly, the Cretaceous-Paleogene extinction event played a role in major radiations of birds, mammals and angiosperms—and this work suggests that it may also have been crucial to boosting calyptrate diversification during the Cenozoic.

More information: Cerretti P, Stireman JO III, Pape T, O'Hara JE, Marinho MAT, Rognes K, et al. (2017) First fossil of an oestroid fly (Diptera: Calyptratae: Oestroidea) and the dating of oestroid divergences. *PLoS ONE* 12(8): e0182101. [DOI: 10.1371/journal.pone.0182101](https://doi.org/10.1371/journal.pone.0182101)

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