

Cenozoic climates and the evolution of green lacewings (Neuroptera: Chrysopidae)

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Green lacewings are familiar insects today, well known by gardeners for controlling aphids and other plant pests. The great majority of its 1200 species belong to the subfamily Chrysopinae, which appeared in the late Eocene; the relictual subfamily Nothochrysinae, however, dominated the family in the early Paleogene. This turnover in subfamily dominance in these nocturnal insects may be explained in part by the Eocene appearance of bats and the evolution of auditory organs in the Chrysopinae that detect bat echolocation sounds, lacking in the Nothochrysinae. We find that climate, however, may also have been a major factor. We examined the climates of their modern and Eocene habitats, which suggest that the Nothochrysinae now occupies a conservative climate type resembling that of those Eocene regions where their fossils have been recovered, but Chrysopinae appears to have been able to expand and flourish in a wide variety of more modern climate types across much the globe since the Eocene, from the hot tropics to cold regions above the Arctic tree line.

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