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Abstract

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Larval Parasitengona (Acari, Prostigmata) parasitizing cave crickets (Orthoptera, Rhaphidophoridae, Ceuthophilinae) in North America*

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The unique morphology of cave animals has interested biologists for a long time, especially with respect to eye and pigment loss. Acari have been recorded from caves around the world, but relatively few show modifications resulting from living in caves. Most mites found in caves are troglophiles or accidentals with only a few troglobitic species reported. The terrestrial Parasitengona associated with caves will be reviewed.

In this study more than 1,000 North American Ceuthophilinae (Orthoptera, Rhaphidophoridae) cave crickets were examined for mites with approximately 40% found to be parasitized by larval Parasitengona. Larvae of the families, Neothrombiidae and Microtrombidiidae (Eutrombidiinae: Hexathrombiini), were regular parasites of *Ceuthophilus* spp. and *Hadenoecus* spp. in two regions of the USA.

The Neothrombiidae were represented by *Ceuthothrombium* spp. in the southwestern USA and northern Mexico while the Eutrombidiinae were represented by two genera parasitizing *Ceuthophilus* spp. and *Hadenoecus* spp. in the caves of Alabama, Kentucky, and Tennessee (USA). All three genera exhibited various modifications resulting from life in caves ranging from reduction or loss of eyes, larval attachment sites on the host, loss of pigment in active postlarval instars, and other morphological modifications.

Ceuthothrombium spp. larvae from cave and non-cave localities in the western USA exhibited a wide variation of eye development ranging from paired eyes to a single eye and a few without eyes. Eutrombidiinae larvae from *Ceuthophilus* spp. and *Hadenoecus* spp. in caves from the eastern USA were all eyeless, but specimens from *Ceuthophilus* spp. retained remnants of an ocular sclerite like *Beronium* from Carabidae (Coleoptera) in Spanish and Moroccan caves. The larvae parasitizing *Hadenoecus* spp. were usually found deep in the caves and were without eyes and ocular sclerites. In addition, larvae from *Hadenoecus* also exhibited reduction a in opisthosomal sclerotization compared to larvae from Alabama *Ceuthophilus*.

The postlarval instars of many terrestrial Parasitengona are unknown. Webb *et al.* (1977) reported that reared deutonymphs of *Ceuthothrombium cavaticum* from larvae parasitizing *Ceuthophilus* sp. from a New Mexico (USA) cave had long slender legs and no eyes or pigment. The reared deutonymphs from *Ceuthophilus* collected in and near Alabama caves were also without eyes and lacked pigment but exhibited no other apparent modifications for life in caves. Whereas reared deutonymphs and adults from larvae parasitizing *Hadenoecus* spp. were eyeless, without pigment, weakly sclerotized, with modified idiosomal setae and deutonymphs molted into adults without feeding, suggesting this mite is a troglobite.

Keywords: Caves, hosts, Neothrombiidae, *Ceuthothrombium*, Microtrombidiidae, Eutrombidiinae, Hexathrombiini, *Ceuthophilus, Hadenoecus*

Reference

Webb, J.P. Jr., Robaux, P. & Campbell, G.D. (1977) Notes on the biology of *Ceuthothrombium cavaticum* (Acari: Trombidiidae), a parasite of cave crickets (Rhaphidophoridae: *Ceuthophilus*). *Bulletin of the Southern California Academy of Sciences*, 7 6 (2), 135–137.

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