



## Post-larval stages of *Ascoschoengastia (Laurentella) lorius* (Gunther) (Acariformes: Trombiculidae) provide evidence for a nest-based life history

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### Abstract

While certain ecological groups of trombiculid mites are thought to be specialised for nest occupation, supporting evidence is rare. A putatively nest-specialised trombiculid is here described in detail. Larvae, a deutonymph and adults of the trombiculid genus *Ascoschoengastia* were collected from three tree hollow nests occupied by Eclectus parrots (*Eclectus roratus*) and Sulphur-crested Cockatoos (*Cacatua galerita*) at Iron Range, Cape York Peninsula. The larvae are *A. (Laurentella) lorius* (Gunther), a species originally described from an Eclectus parrot in Papua New Guinea. Deutonymph and adult *Ascoschoengastia* are also assigned to this species based on their co-occurrence with larvae in this specific and isolated microhabitat. *A. (L.) lorius* is inferred to have a nest-based life history. Active stases are described with attention to sensory setae. The previous synonymy of *A. (L.) daria* with *A. (L.) lorius* is rejected. A key to Australian species of *Ascoschoengastia* is presented.

**Key words:** nidicole, arboreal, tree hollow nest, yeast, endosymbiosis, Psittaciformes

### Introduction

Trombiculoid mites are parasitic as larvae, feeding exclusively on the tissue fluids of their hosts, which are usually terrestrial or amphibious vertebrates. After a period of engorgement, a larva detaches, and forsaking parasitic habits, undergoes four moults, firstly to a protonymph (calyptostase), then to deutonymph, tritonymph (calyptostase) and finally an adult stage. Both deutonymph and adult stases prey upon mostly sessile stages of arthropods, often eggs (Lipovsky 1954).

Nadchatram (1970) divided chiggers into seven groupings based on habitat preferences. For adults of the most commonly encountered chiggers [viz. Ecological Group I of Nadchatram (1970)] the sharp shift in feeding modes between larvae and postlarvae usually produces an equally sharp habitat shift between larval life on the host and a postlarval existence in soil or litter. Hence they often become spatially separated from the host or hosts which fed them as larvae, and the next generation of larvae must reassociate with hosts by ambushing them from a wide variety of sites. These sites probably only occasionally include nests (some examples in Nadchatram, 1970). However the proximity of larvae to their intended hosts is always approximate. In contrast, some habitat-specialised trombiculoids remain closely associated with hosts by adopting strict nidicolous habits (Ecological Groups II and III), i.e. postlarvae of such chiggers inhabit nests. Nidicolous habits have been confirmed for *Ascoschoengastia (Laurentella) indica* (Hirst) in a detailed study involving recovery of postlarval stages from arboreal rat nests (Wharton 1946). There have also been other inferences of nidicolous habits for other taxa, but little supporting data. Indeed, postlarvae of *Neotrombicula autumnalis* (Shaw) were initially assumed to occur in the nests of field mice and voles (Hirst 1926) when in fact they are now known to live dispersed in the soil (Cockings 1948). Gunther (1939a) suggested that adults of the unusual and highly-specialised chigger *Guntheria (Guntheria) kallipygos* (Gunther) might live in nests. Audy (1954) suggested that the lifecycles of *Microtrombicula munda* (Gater) and *A. (Laurentella) audyi* (Womersley) would be passed mostly in or near the nests of its rat hosts, and Audy (1956) suggested that the subgenus *Laurentella* is comprised exclusively of nest specialists. Nadchatram (1970) provided many likely