

# Development of Gnathal Appendages of a Wood-feeding Cockroach, *Cryptocercus punctulatus* Scudder (Insecta: Blattodea, Cryptocercidae)\*1,\*2

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Development of gnathal appendages in *Cryptocercus punctulatus* was followed with scanning electron microscopy. The oothecae of *C. punctulatus* were collected from rotten logs at the Mountain Lake Biological Station, Virginia, USA. The eggs in the ootheca, of which crest structure was cut along the median line prior to fixation, were fixed with a 50% dilution Karnovsky's fixative for two days, and stored in a 70% ethanol. The fixed embryos were removed from the egg, dehydrated, critical-point dried, and coated with gold using standard procedures. They were then observed under a

TOPCON SM-300 scanning electron microscope.

Whereas the maxillary and labial appendages are divided into the proximal coxopodite and distal telopodite, the mandibular appendage does not suffer from any divisions, being represented only by coxopodite without telopodal elements developed. The maxillary and labial telopodites develop into the palps. The coxopodite is subdivided into the cardo and stipes in the maxilla, and into the postmentum and prementum in the labium.

Two swellings arise in the coxopodites of maxilla and

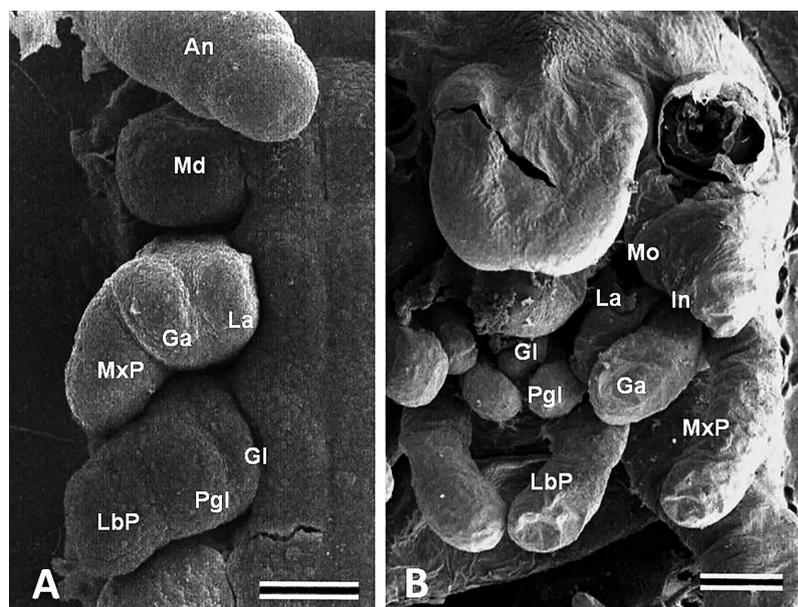


Fig. 1 SEMs of gnathal appendages of *Cryptocercus punctulatus* embryos in the middle (A) and late (B) developmental stages. See the text. An: antenna, Ga: galea, Gl: glossa, In: incisor, La: lacinia, LbP: labial palp, Md: mandible, Mo: molar, MxP: maxillary palp, Pgl: paraglossa. Scales = 50  $\mu$ m.

\*1 Abstract of paper read at the 49th Annual Meeting of the Arthropodan Embryological Society of Japan, June 7–8, 2013 (Tsukuba-san, Ibaraki).

\*2 This article, which was accepted in 2013 and should have been published in 2014, was printed in 2017 being much delayed due to various circumstances.

labium as coxopodal endites: the medial lacinia and lateral galea in the maxilla, and medial glossa and lateral paraglossa in the labium (Fig. 1A). In the mandible, two teeth, *i.e.*, the distal incisor and proximal molar teeth are formed, each of which may be homologized with the maxillary galea and labial

paraglossa and with the maxillary lacinia and labial glossa, respectively (Fig. 1B).

With the progressive cephalization, the labial coxopodites of both sides come near to and finally fuse with each other, to form the prementum and postmentum.