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MICROMALTHUS (Coleoptera: Micromalthidae) IN HONG KONG

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Abstract: "Triungulin" larvae of a species of *Micromalthus* (Coleoptera), reportedly taken from Hong Kong tap water, are described and compared with descriptions of triungulin larvae of *Micromalthus debilis* Le Conte, the only known species, from African mines. The detailed morphology differs, notably in the presence of an ocellus on each side of the head of the Hong Kong specimens. The specimens are not made the basis of a new species since adult material is not available. *Micromalthus debilis* has been reported from North America, Cuba, Brazil, Hawaii and South Africa. A full bibliography is provided.

The adult of *Micromalthus debilis* was described by LeConte (1878) from North America, and Hubbard (1878) provided a brief description of its cerambycoid larva. Originally placed in the Lymexylonidae by LeConte and Hubbard, the systematic position of *Micromalthus* has since been the subject of controversy, due chiefly to differing views on the polyphagid or adephagid nature of the tarsus.

Sharp and Muir (1912) and Barber (1913) regarded the insect as polyphagid, placing it near the Helodidae (on male genitalia) and Nitidulidae (on antennae and adult habits) respectively. However, on the basis of the adephagid nature of the tarsus of the triungulin larva and on the structure of the maxilla, de Peyerimhoff (1913) suggested relationship with the Cupedidae in the Archostemata, a sub-order believed to have arisen before the Coleoptera split into adephagid and polyphagid groups. This view was later supported by Crowson (1938). The type of wing-folding (Forbes, 1926), and venation (Van Emden, 1932; Paterson, 1938) were claimed as adephagid, and Böving and Craighead (1931) and Meixner (1935) regarded the beetle as having adephagid affinities. Here the matter rested until Jeannel and Paulian (1944) asserted that the tarsal structure had been wrongly interpreted, and *Micromalthus* was replaced near the Lymexylonidae (Jeannel, 1949; Paulian, 1949). The situation has since been reviewed by Carpentier (1952), who, after a detailed examination of the tarsus, re-affirmed its adephagid nature and advocated the removal of *Micromalthus* from proximity with the Lymexylonidae. Crowson (1955) and Imms (1957) replace it near the Cupedidae.

The remarkable life-cycle of this beetle was first described by Barber (1913a and b), and Caillol (1914) made theoretical criticisms of Barber's suggestions. More recently, Scott (1936, 1938, 1941) has amplified various details of the life history.

The life-cycle and morphology of the immature stages of a species of *Micromalthus* occurring in moist mine timbers in South Africa have been investigated by Pringle (1938), and the morphology of the adult by Paterson (1938). The latter author is of the opinion that the South African specimens, although showing slight morphological differences, should be assigned to *M. debilis*. Pringle considers it possible that the beetles were introduced from America in infested timber. The species has since been recorded from Hawaii (Swezey, 1940), and Cuba and Brazil (Silvestri, 1941), but we know of no record of its occurrence in the Oriental region.

Whilst investigating living organisms supposedly occurring in Hong Kong tap water, a considerable number of living beetle larvae were found. These larvae proved to be "triungulin larvae" of *Micromalthus* (fig. 10a), and differences from previously described "triungulin" stages of *M. debilis* are given below.

Comparison with African specimens

Body. Dimensions (fig. 1). Body length: 1.45–1.90 mm (15 specimens); width of head capsule: 0.20–0.25 mm (15 specimens). Pringle's values, of 1.75 mm, and 0.25 mm respectively, fall within these ranges. Lateral setae: 2–3× longer than as indicated in Pringle's drawings. **Head.** Epicranial suture does not fork anteriorly, thereby agreeing with Pringle (but differing from Böving and Craighead). Ocelli: One ocellus present on each side of head (fig. 10b). Pringle states that ocelli are lacking in African specimens. **Antennae** (fig. 2). No fundamental difference from Pringle. (Pringle mentions the seta on segment 2, but does not show it in the drawing). **Mouth Parts.** Labrum (fig. 3): Pringle refers to setae numbered 1–6 in fig. 3, but states that there are—"several downwardly directed setae on ventral surface of labrum." These may be referable to the 2 rows of dorsal se-

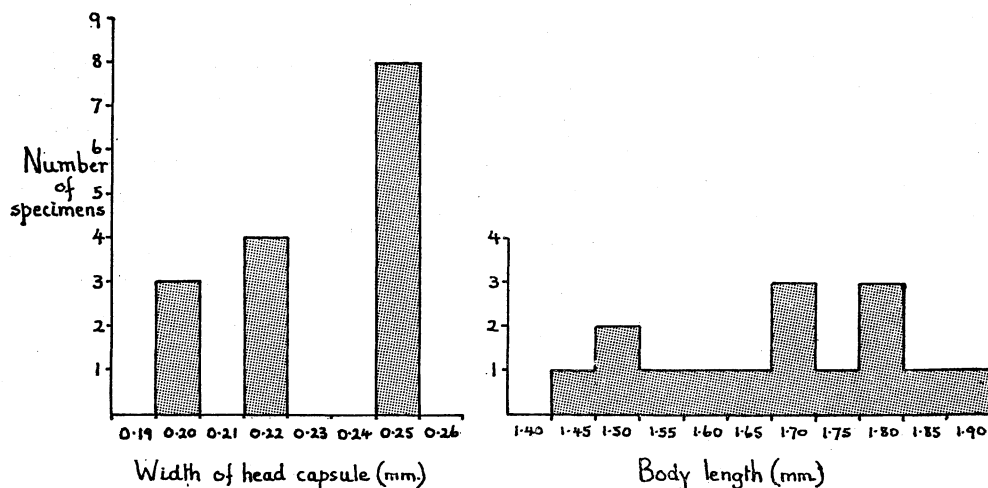
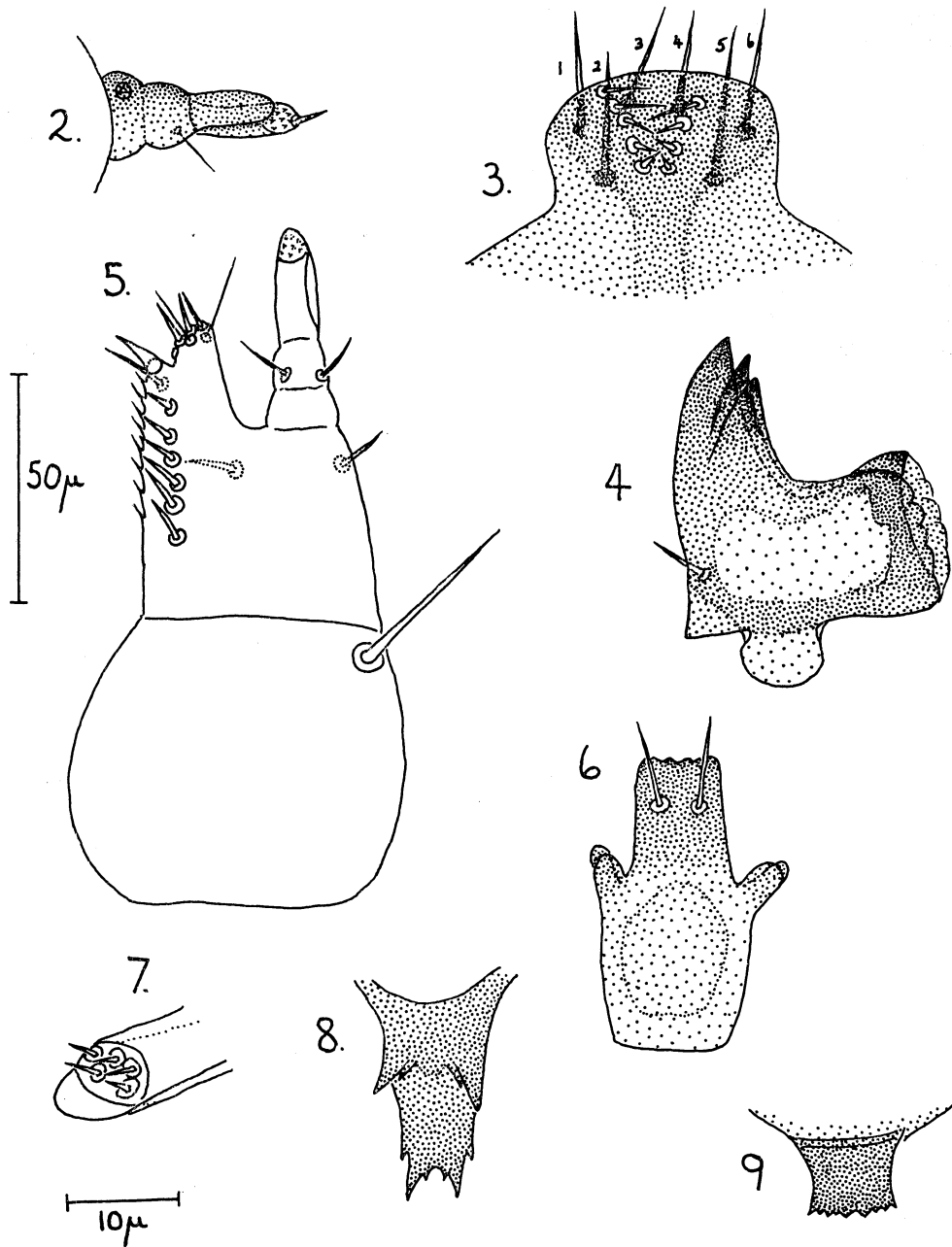


Fig. 1. Dimensions of 15 specimens of *Micromalthus triungulin* larvae.



Figs. 2-9. Triungulin larva of *Micromalthus*. 2, right antenna, ventral view; 3, labrum, dorsal view; 4, right mandible, ventral view; 5, right maxilla, dorsal view; 6, labium, ventral view; 7, tip of labial palp, ventral view; 8, dorsal anal plate, ventral view; 9, ventral anal plate, dorsal view. (All except fig. 7 to common scale).

tae arranged in a V. Mandibles (fig. 4): The molar area has a dorsal tooth. This is not indicated in Pringle's drawing. Maxillae (fig. 5): Only 2 (not 5) ventrally placed setae are present on the stipes. The galea does not appear to be divided off from the stipes as in the South African specimens and bears 3 (not 2) stout spines and 2 (not 3) setae. The lacinia does not bear 2 rows of spurs. There is present a dorsal row of 6 (not 7) socketed spines, and Pringle's ventral row of spurs appears to be the serrated edge of the lacinia. There is 1 ventral seta near the anterior stout spur (corresponding with 1 of the stipeal setae of South African specimens). Labium (fig. 6): The ligula is similar to that of the cerambycid larva, and differs in shape from that of the triungulin larva of South African specimens. The labial palps are present as 2 (not 3) juxtapositioned segments, the *posterior* of which has terminal setae (fig. 7), whereas in South African specimens the *anterior* of the segments is "furnished with terminal sensory papillae." *Anal*

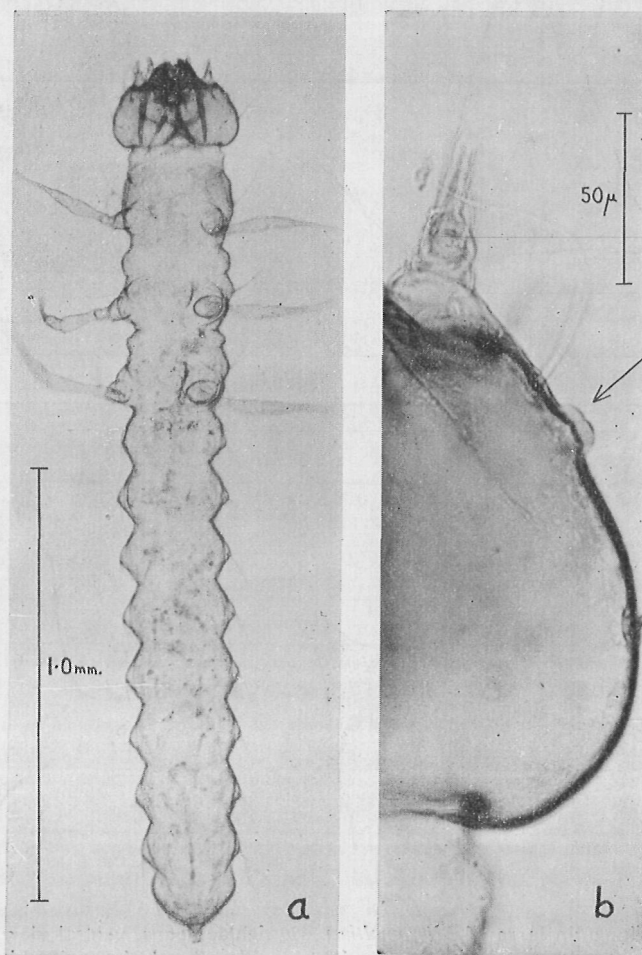


Fig. 10. a, triungulin larva of *Micromalthus*, ventral view (KOH preparation—stained acid fuchsin); b, side of head capsule of triungulin, showing ocellus.

Plates (figs. 8 and 9). Not described in detail or drawn by Pringle.

The Hong Kong specimens thus differ in detailed morphology from both the North American and South African triungulin stages. The most significant difference, however, is the presence of one ocellus on each side of the head of the Hong Kong specimens (fig. 10b), particularly in view of Paulian's contention (Paulian, 1949) that the triungulin stage is a dispersal phase.

When taken out of the water sample and placed on soaked rotting timber, the Hong Kong triungulins readily moved into the interstices. On a smooth flat surface locomotion appeared to be difficult, whereas on the surface of the timber it was unimpaired, movement being accompanied by a scorpion-like forward curving of the abdomen.

The Hong Kong specimens were collected *supposedly* from tap-water in both Victoria and Kowloon cities, from areas supplied by different reservoirs, in May 1962, at a period when the water level in both reservoirs was extremely low. We are unable to determine the source of the specimens more specifically than this.

Material and slides upon which this note is based have been lodged in the British Museum (Nat. Hist.).

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(Continued on page 769)