

# Picnic Beetle up Close

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With Winter set in here in eastern Canada it's a good time to sort through the freezer for specimens to photograph. This little Picnic Beetle (*Glischrochilus fasciatus*) (Fig.1) was collected last Summer and turned out to be the host of several mites which were the basis of an article in the November 2011 Micscape Magazine.



Fig.1. Dorsal view of Picnic Beetle.



Fig. 2. Dorsal view of head.

As in all insects the body plan consists of a head (Fig. 2), with associated sensory organs and mouth parts; a thorax where the wings and legs originate; and an abdomen that contains most of the internal organs. In this beetle and a few other species I have examined the back of the head is rounded and fits into a socket on the front end of the thorax – a ball-and-socket joint. The anterior leading edge of the thorax has a row of forward-pointing flat hairs that form a brush border (Fig. 2), and seen in more detail in a ground beetle (*Carabus* sp.) (Figs. 3, 4). These hairs may function to prevent foreign matter entering the ball-and-socket joint and/or may be sensory to tell the beetle the orientation of its head.

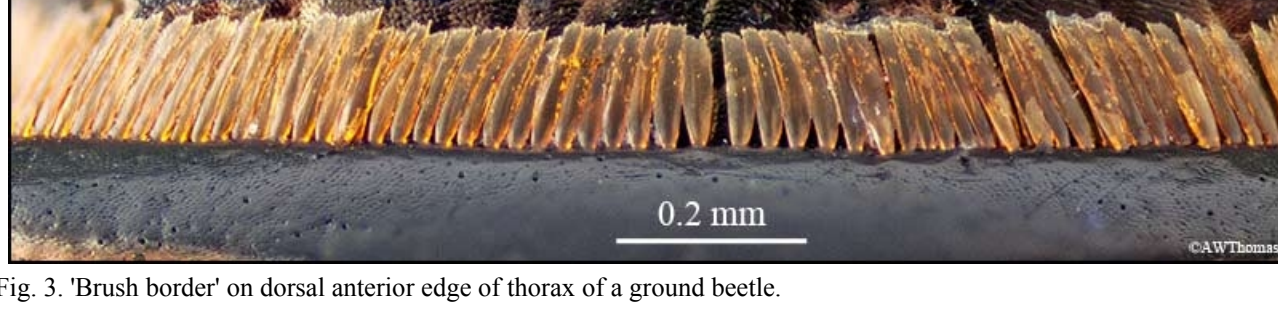


Fig. 3. 'Brush border' on dorsal anterior edge of thorax of a ground beetle.

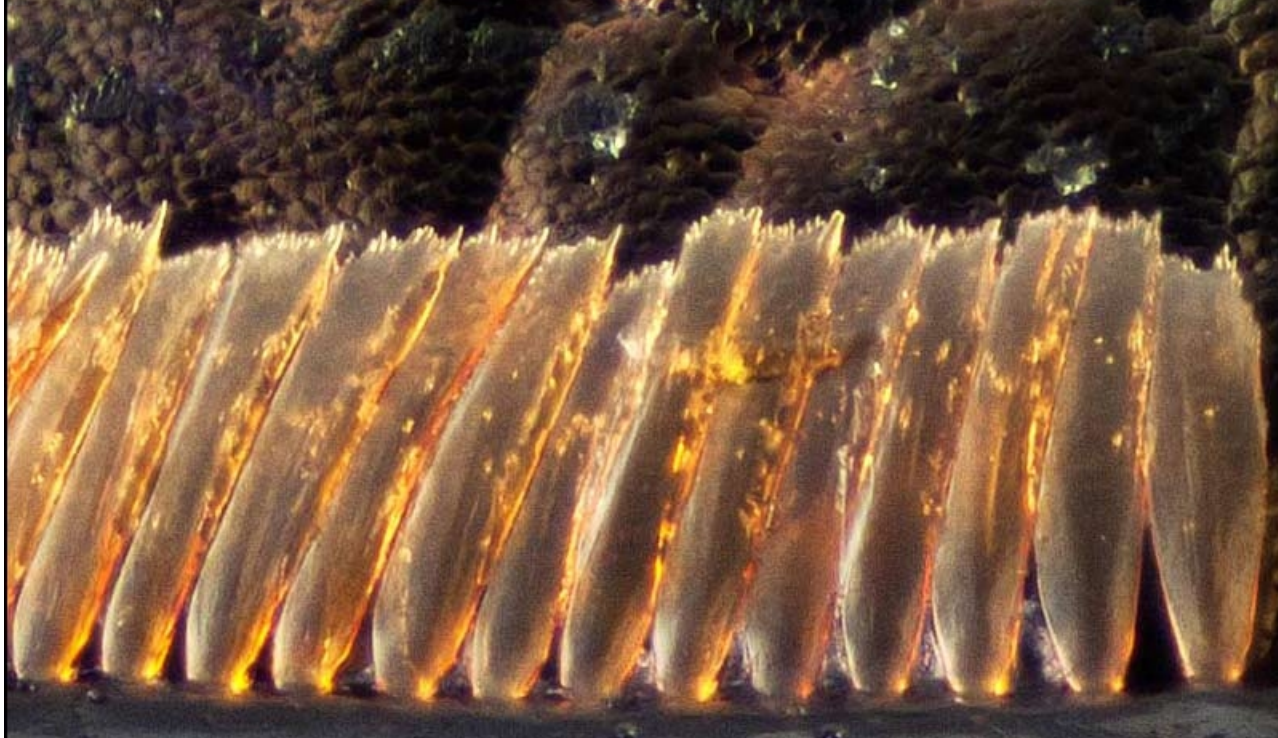


Fig. 4. 'Brush border' on dorsal anterior edge of thorax of a ground beetle.

## Head

Perhaps the most interesting part for the microscopist because of the modifications of the appendages. The most obvious (in most beetles) are the antennae. Antennae are subject to much variation and entomologists have come up with several descriptive terms. This Picnic Beetle has "capitate-clubbed" antennae (Fig. 5).



Fig. 5. Tip of antenna of Picnic Beetle. Left natural, reflective light; right after treatment in KOH, transmitted light.

The apical 3 segments are significantly larger than the preceding segments with the dorsal surfaces, cup-shaped in the two penultimate segments and cone-shaped in the top segment, covered with sensory hairs and pits for odour detection (Fig. 6).

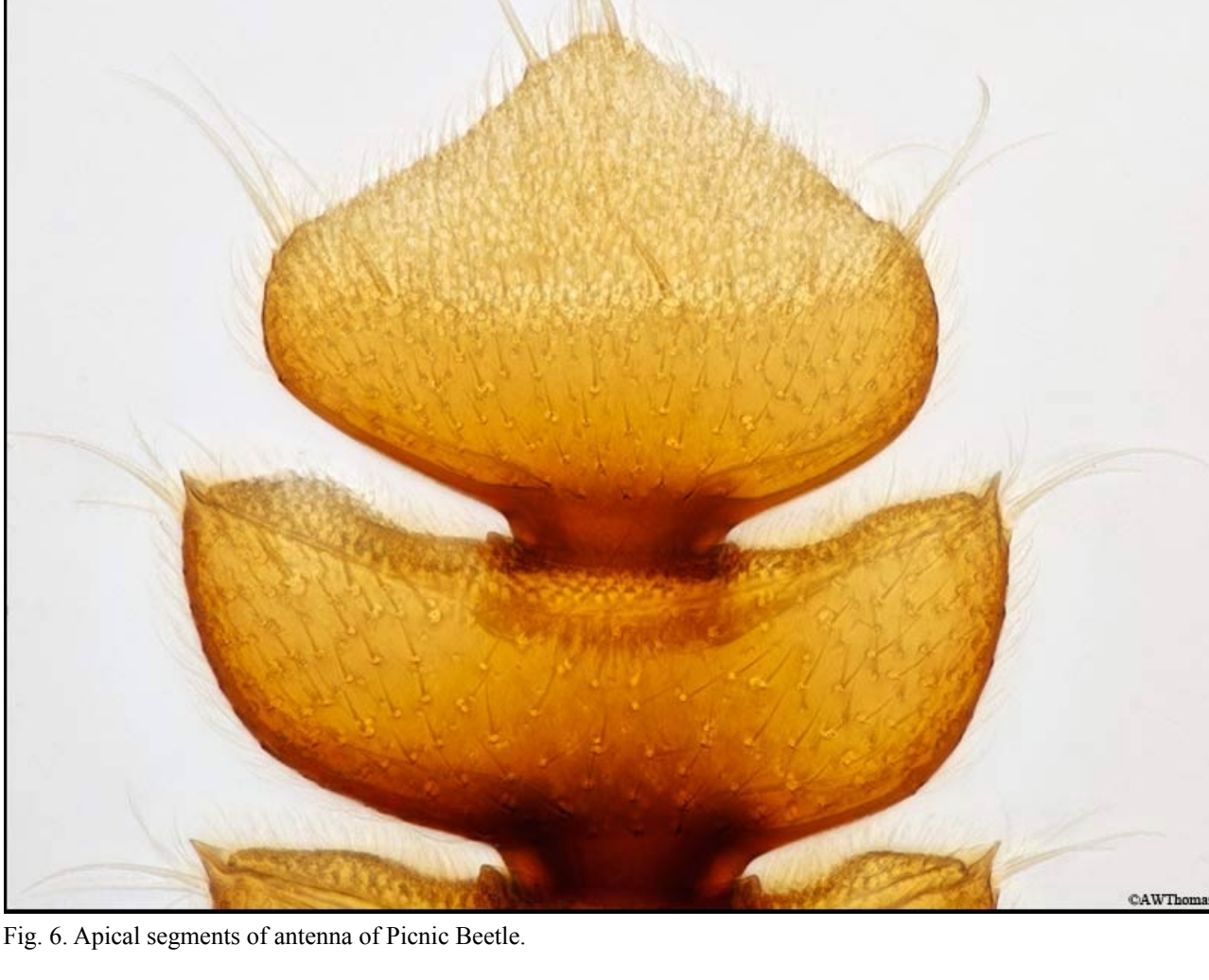


Fig. 6. Apical segments of antenna of Picnic Beetle.

## Mouthparts

The mouthparts consist of a pair of heavily sclerotized mandibles that crush food. On the head segment embryonically behind the mandibles but now immediately below them are the maxillae (Fig. 7) consisting of two segments that have fused in the midline. Now there are a pair of palps, sensory organs that test the quality of the food, and a pair of brush-like lobes. The entire maxillae can move backwards and forwards and in doing so food particles are pushed into the mouth. The brush-like maxillary lobes are used for cleaning the antennae and palps.

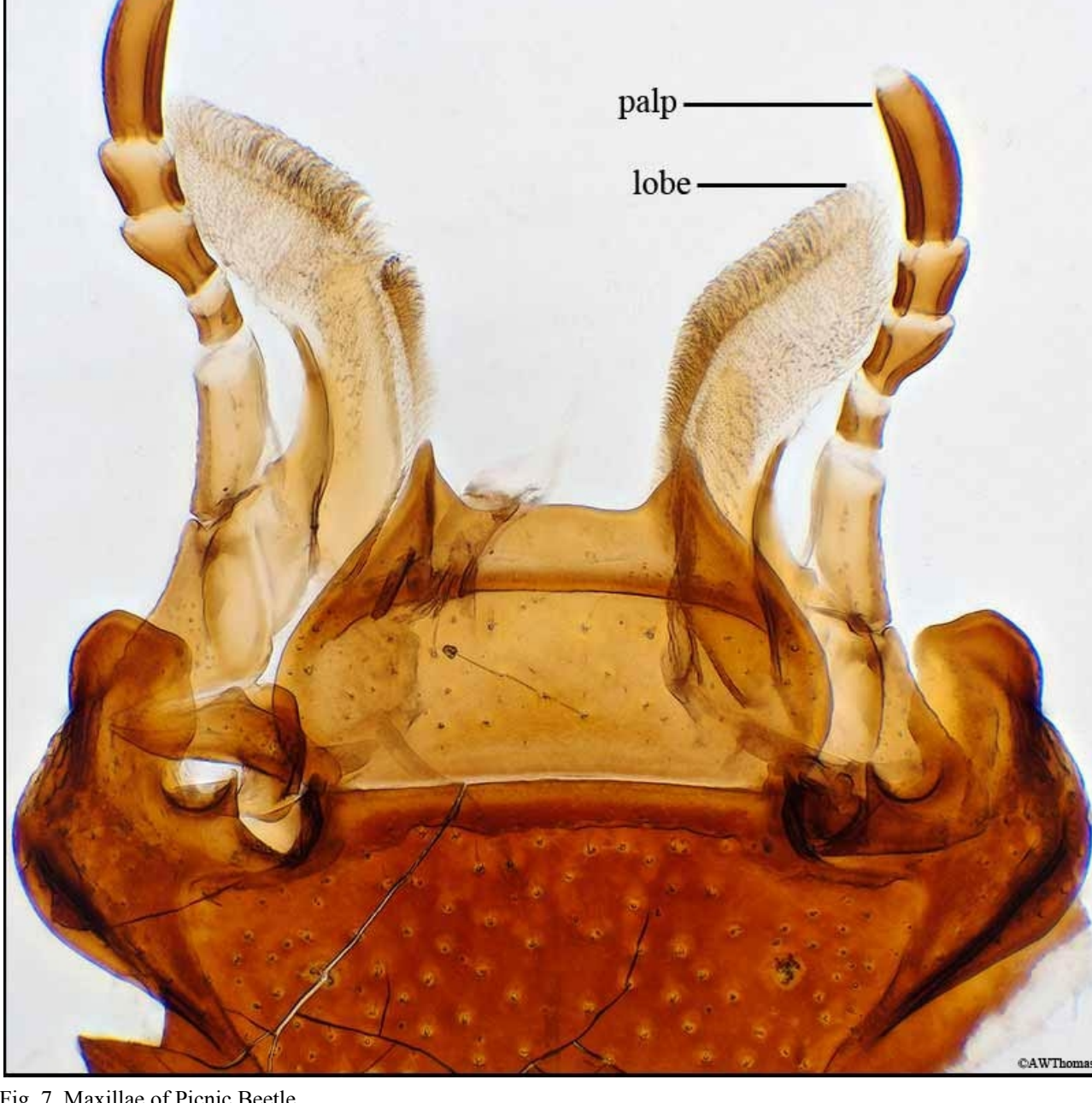


Fig. 7. Maxillae of Picnic Beetle

Below the maxillae is another pair of appendages that have fused to form the 2<sup>nd</sup> maxillae, labium or lower lip (Fig. 8). It has a similar form and function as that of the 1<sup>st</sup> maxillae.



Fig. 8. Labium or 2<sup>nd</sup> maxillae of Picnic beetle.

## Thorax

The 3-segmented thorax houses the muscles that move both the wings and the legs. In beetles the 1<sup>st</sup> pair of wings are often modified into thickened elytra that serve to protect the membranous wings and the abdomen. In most insects the wings are larger than the rest of the body and almost always exposed. Beetles also have large wings but they have the ability to fold the wings into small packages that fit beneath the protective elytra (Fig.9).

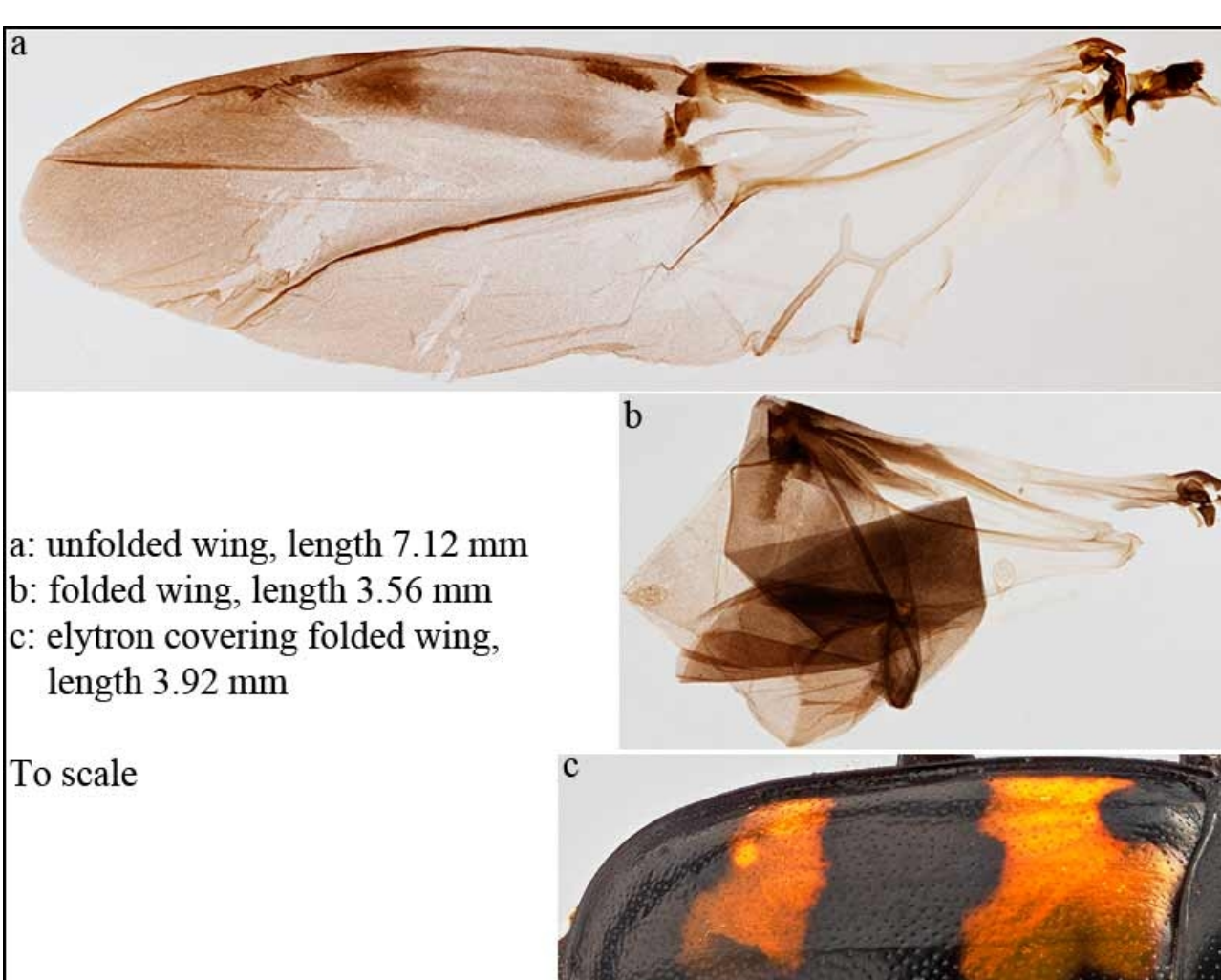


Fig. 9. Wing of Picnic Beetle.

Each of the six legs ends in an anchor-like segment, a long shaft with two end hooks allowing the beetle to hold onto many surfaces (Fig. 10).



Fig. 10. Last tarsal segment of a leg of Picnic Beetle.

## Microscope and Photographic Equipment

My basic equipment is an Olympus BH2 with 2x, 4x, 10x, 20x, 40x, 60x, and 100x objectives; Olympus 2.5x NFK relay lens. I also have the components for Phase Contrast, DIC and Polarization. Camera is a Nikon D90 with Nikon PB-6 bellows; Nikon flash in place of Olympus' halogen lamp. For reflected light images I use Nikon CF objectives and El-Nikkor enlarging lenses.

Most images are stacks of several frames processed by Zerene Stacker.



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Published in the February 2012 issue of Micscape Magazine, [www.micscape.org](http://www.micscape.org).