

IN THE GARDEN – NOVEMBER

(8-, '1,000' - legs)

Part II of the December 2020 Micscape Magazine [article](#); same method, same samples. The collection method, heat/drying extraction using a Berlese Funnel and collecting the critters in alcohol resulted in the Springtails preserved in a reasonably natural position (see Part I). This method of collection left the harvestmen and spiders with their legs in a folded-up condition. These critters are best photographed when alive. I have included a couple of live images from past years to give a better idea of how they should look.

The 8-legged

Spiders (Class: Arachnida, Order: Araneae) are the quintessential 8-legged Arthropods with many specimens in the leaf-litter samples. Less frequently seen but quite common, during the summer, are the 8-legged Harvestmen (Class: Arachnidae, Order: Opiliones) with just two specimens in the samples. I will start with the **HARVESTMAN**. Figure 1 shows the eyes on a prominent tubercle (arrow in right specimen), the extremely long legs and the sensory palps (forward pointing in the right image, in life held vertically).

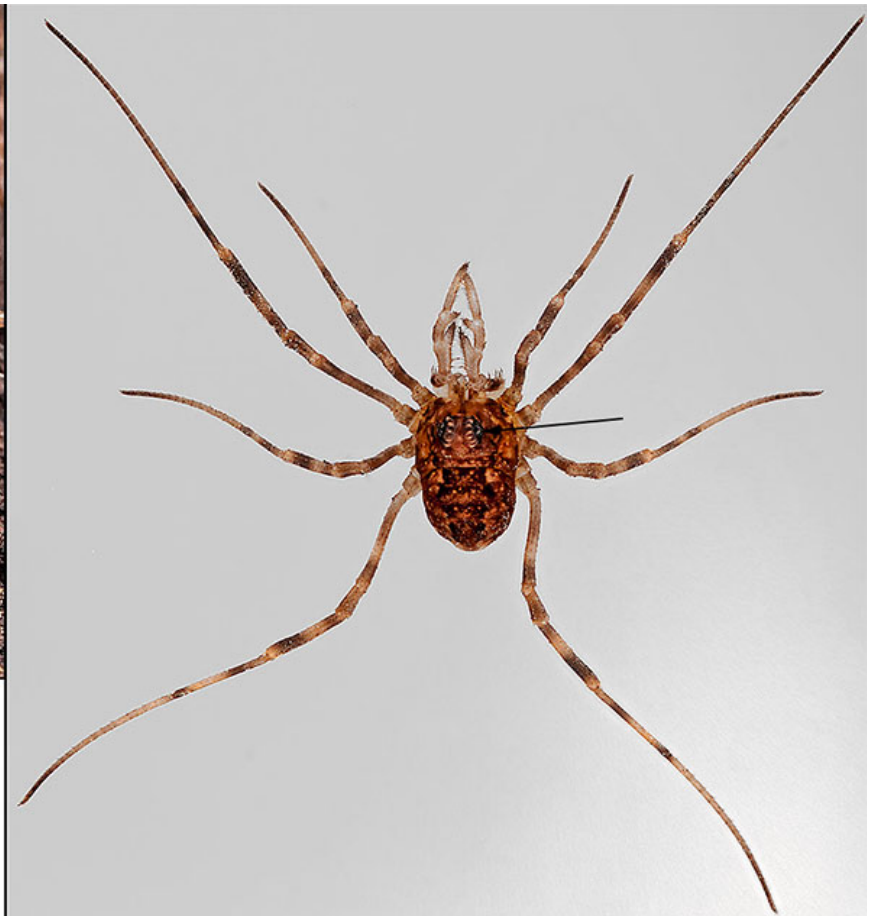


Fig. 1. Harvestmen, note eight long legs and two widely separated eyes on a raised tubercle.

Figure 2 is a lateral view showing the right eye and compact body; specimen from the litter-alcohol sample. Figure 3 is a front view and Figure 4 a top view of the ocular tubercle.



Fig. 2. Lateral view of harvestman.



Fig. 3. Front, face, view of the Harvestman showing the raised ocular tubercle and the large sensory palps that assist in feeding. At the bottom of the image you can see the pincer chelicerae below the palps (see also Fig. 5). Compare the eyes with those of spiders Figs. 11, 12, 13.

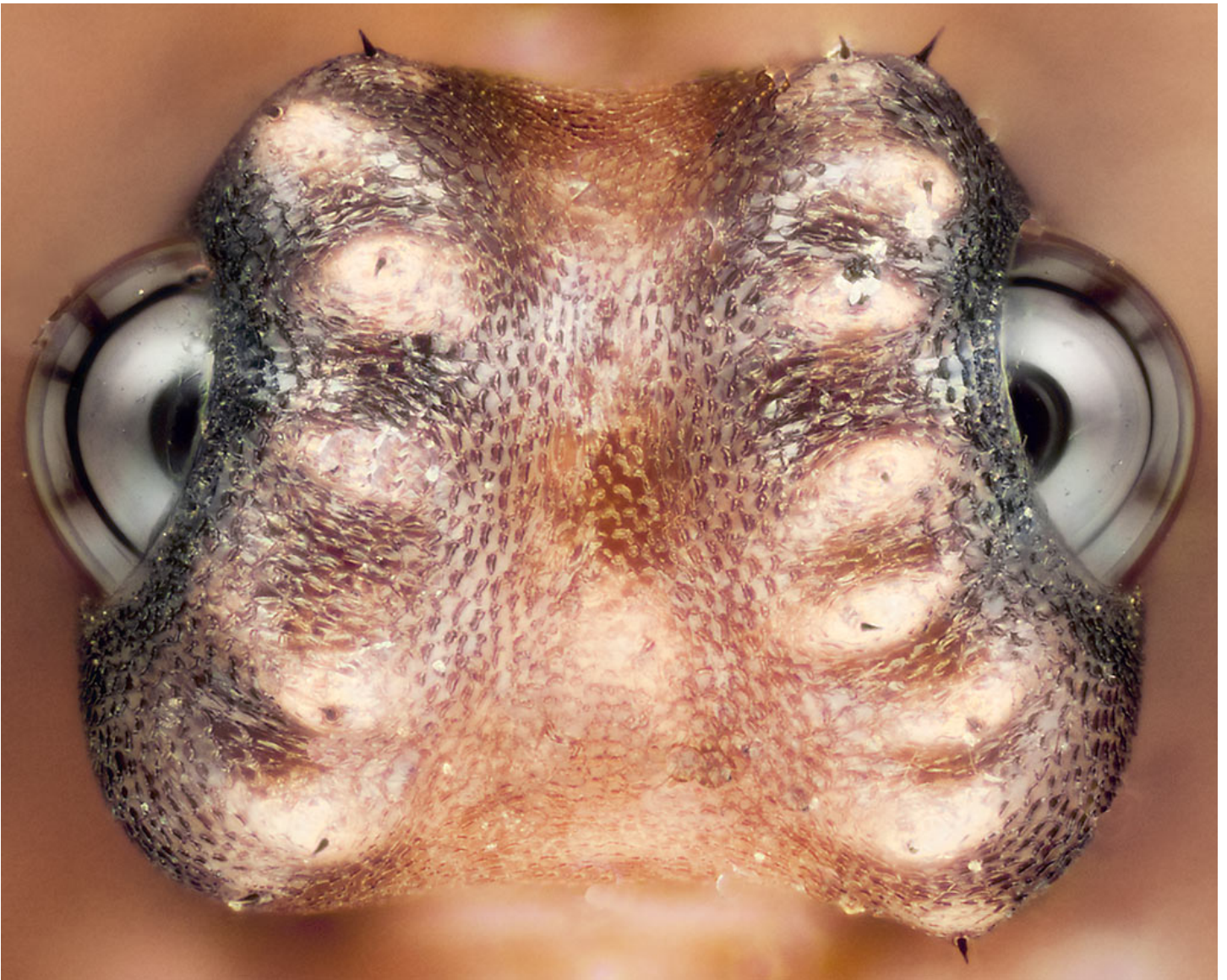


Fig. 4. Eyes on ocular tubercle, viewed from above. Big difference between spiders and harvestmen is the eyes, 2 raised ones in harvestmen and a total of 8 on the front and top of the face in spiders.

Harvestmen are predatory carnivores and use their legs and palps to hold onto prey and the pincers on the chelicerae to tear it to bits (Fig. 5). Figure 6 is a close up view of the pincers of another individual. Although tiny, the pincers likely exert a lot of force as they are attached to relatively large muscles (Fig. 7), polarized light. Formidable predators if you are a Springtail.



Fig. 5. Sensory palps and chelicerae of a Harvestman. Note the relatively large palps with lots of spines and tiny terminal hooks for holding prey, and the tiny pincers on the chelicerae for tearing prey apart.

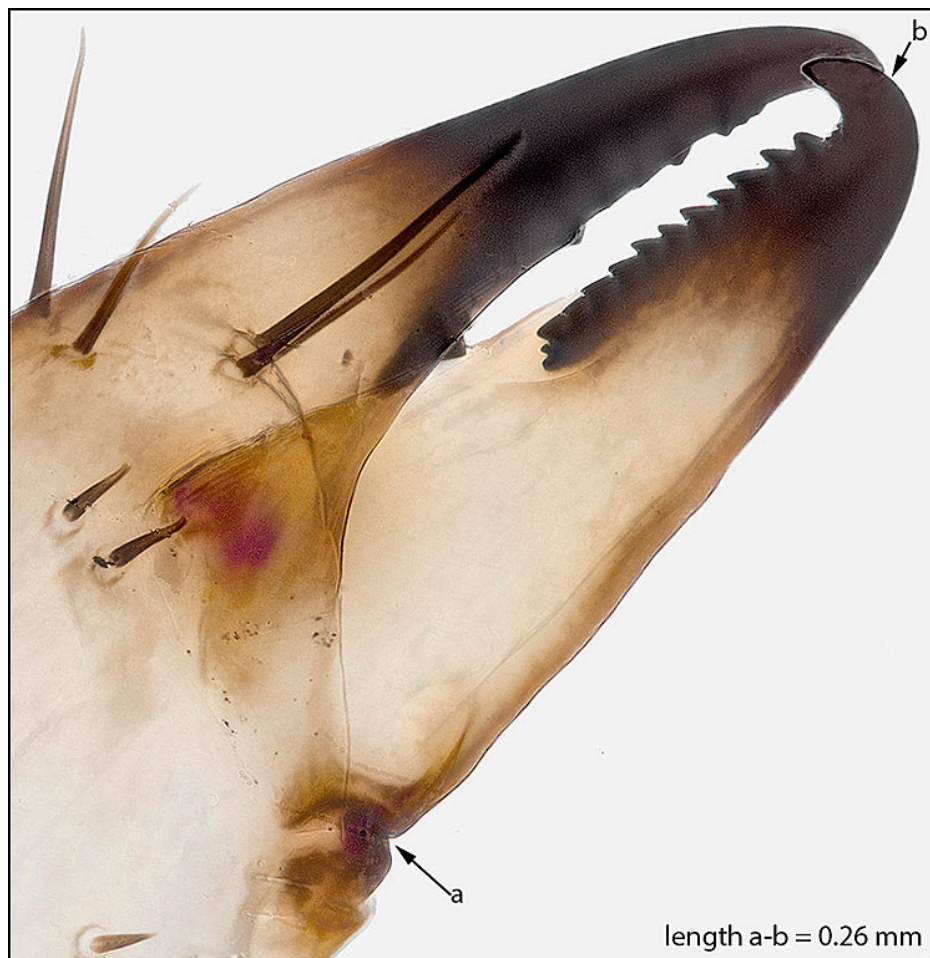


Fig. 6. Pincers on chelicerae



Fig. 7. Chelicerae of a harvestman, polarized light.

The 'skin' was somewhat leathery, its surface covered with very short scale-like protrusions and with scattered sensory spines (Fig. 8). Top image represents 0.29 mm of body surface magnified 125x. The sensory spines are about 20 μ long.

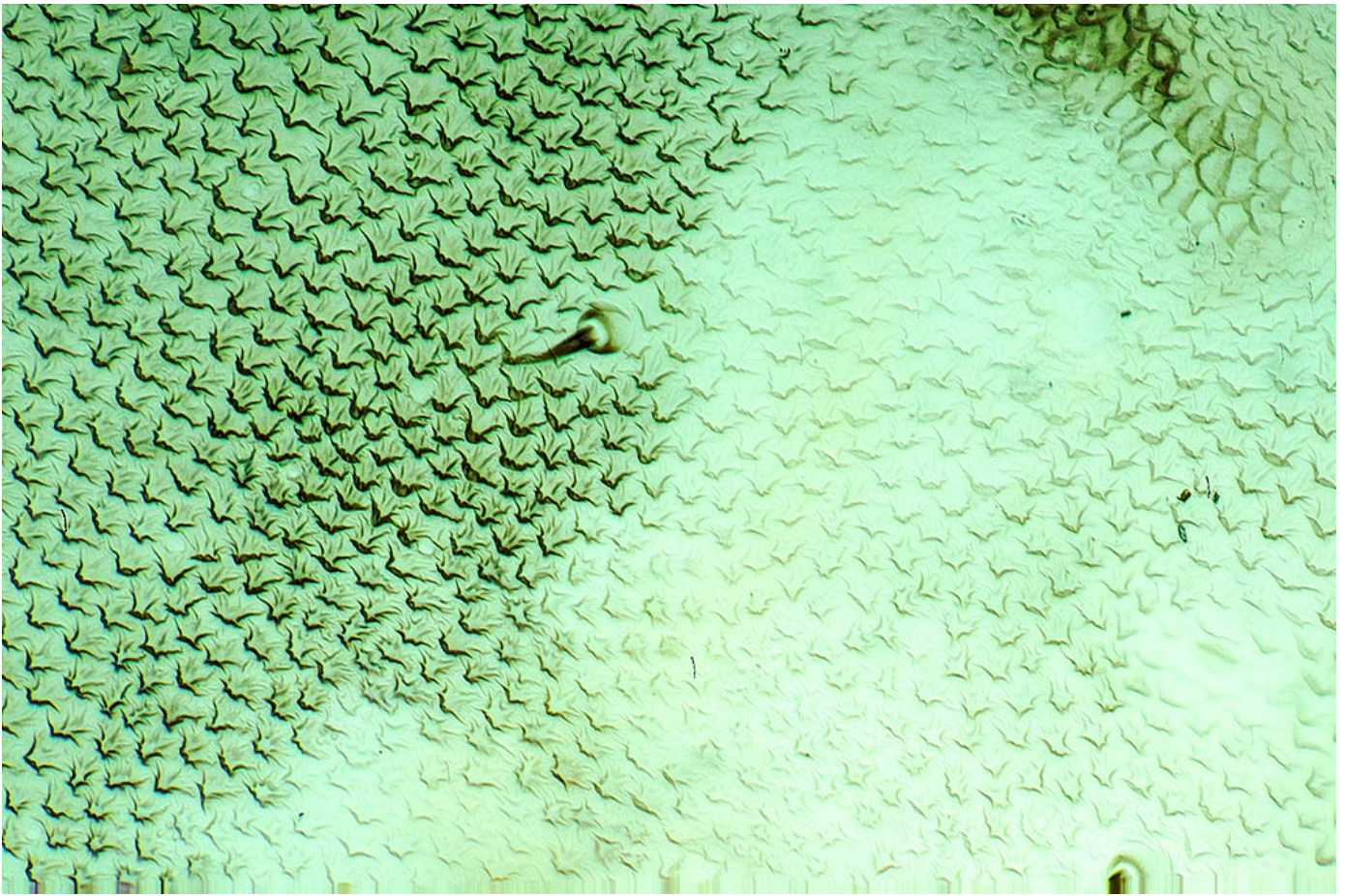


Fig. 8. Body surface of a harvestman; top 125x magnification, camera sensor 36 mm wide.

There were many **SPIDERS** in the samples of several species, they must eat lots of the smaller critters in the leaf litter. An authority (ref: 1) estimated the population of spiders in the UK as 2.25 million/acre and that the weight of insects killed by them each year would well exceed the total weight of the (UK) human population. The most abundant species in the litter was a **Ground Crab Spider** (Family: Thomisidae, *Xysticus elegans*) (Fig. 9).



Fig. 9. A Ground Crab Spider. A common inhabitant of litter.

The other spiders in the litter samples appeared to be Ground (Mouse)Spiders (Family: Gnaphosidae). I had a live image of one of the species from litter in February 2019 (Fig. 10).



Fig. 10. A Ground (Mouse) Spider from litter, alive; same species collected in November 2020 sample.

Figure 11 shows four other tiny spiders from the litter that are possibly Ground (Mouse) Spiders.



Fig. 11. Small spiders from leaf litter.

The eye pattern of spiders varies depending on which family they belong. Crab Spiders (Family: Thomisidae) have two small dorsal eyes and two small eyes facing forward on the front of the face, on each side of the head are 2 large eyes with one pair, one right and one left, facing sideways to the front and one pair facing backwards! (Fig. 12).

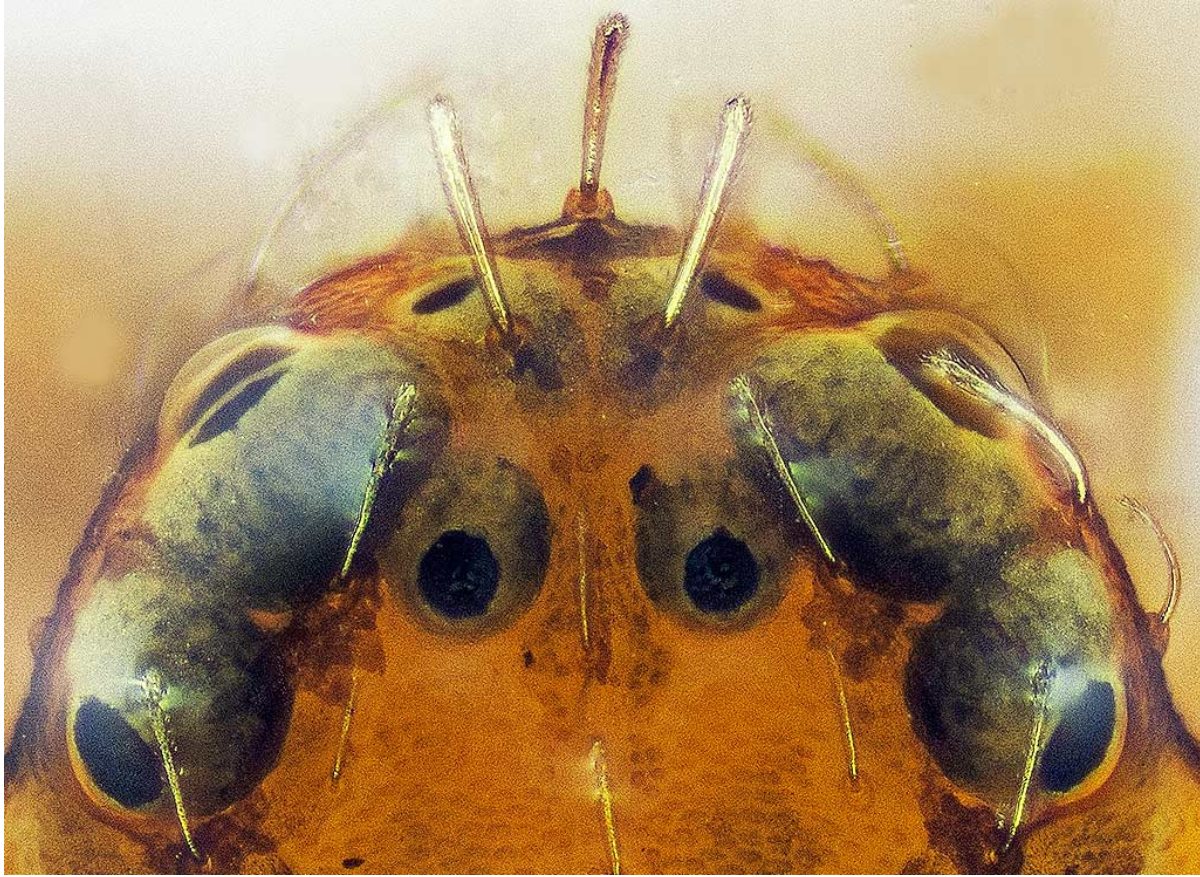


Fig. 12. Eye pattern of the Ground Crab Spider (Family: Thomisidae) in Fig. 9.

Figure 13 shows the eye pattern of the top two spiders in Fig. 11.



Fig. 13. Eye patterns

Besides differing from harvestmen in eye-structure, spiders also differ in the mouthparts even though both Harvestmen and Spiders are closely related, they are both in the Class: Arachnidae, and are predators. Spiders have a pair of poison fangs for holding and killing prey (Fig. 14) whereas Harvestmen have pincers for tearing prey apart (see Fig. 6).



Fig. 14. Poison fangs of a spider (cf. Fig. 6 harvestman). This image first posted in the November 2016 issue of Micscape Magazine.

MITES were abundant in the samples, perhaps the most common critters. According to ref: 1 mites tend to be avoided by many predators, and it is rare for spiders (also common in the samples) to kill or eat mites. This is in part due to the mites' strong chitinous exoskeleton, but in main to their distastefulness.

I was unable to identify the mites except for one small orange species known as a Snout Mite (Family: Bdellidae, Genus: *Neomolgus*) (Fig. 15) and a very dark, hard-bodied, Oribatid Mite (Fig. 16, left). When selecting the mites from the alcohol vials I was fooled by several Minute Hooded Beetles (Family: Corylophidae). These beetles are small (1 mm long) circular in outline, highly convex dorsally and superficially identical to the oribatid mites in the samples; only on closer examination could they be seen to have six legs, compound eyes, antennae, and a segmented abdomen (Fig. 16, right).

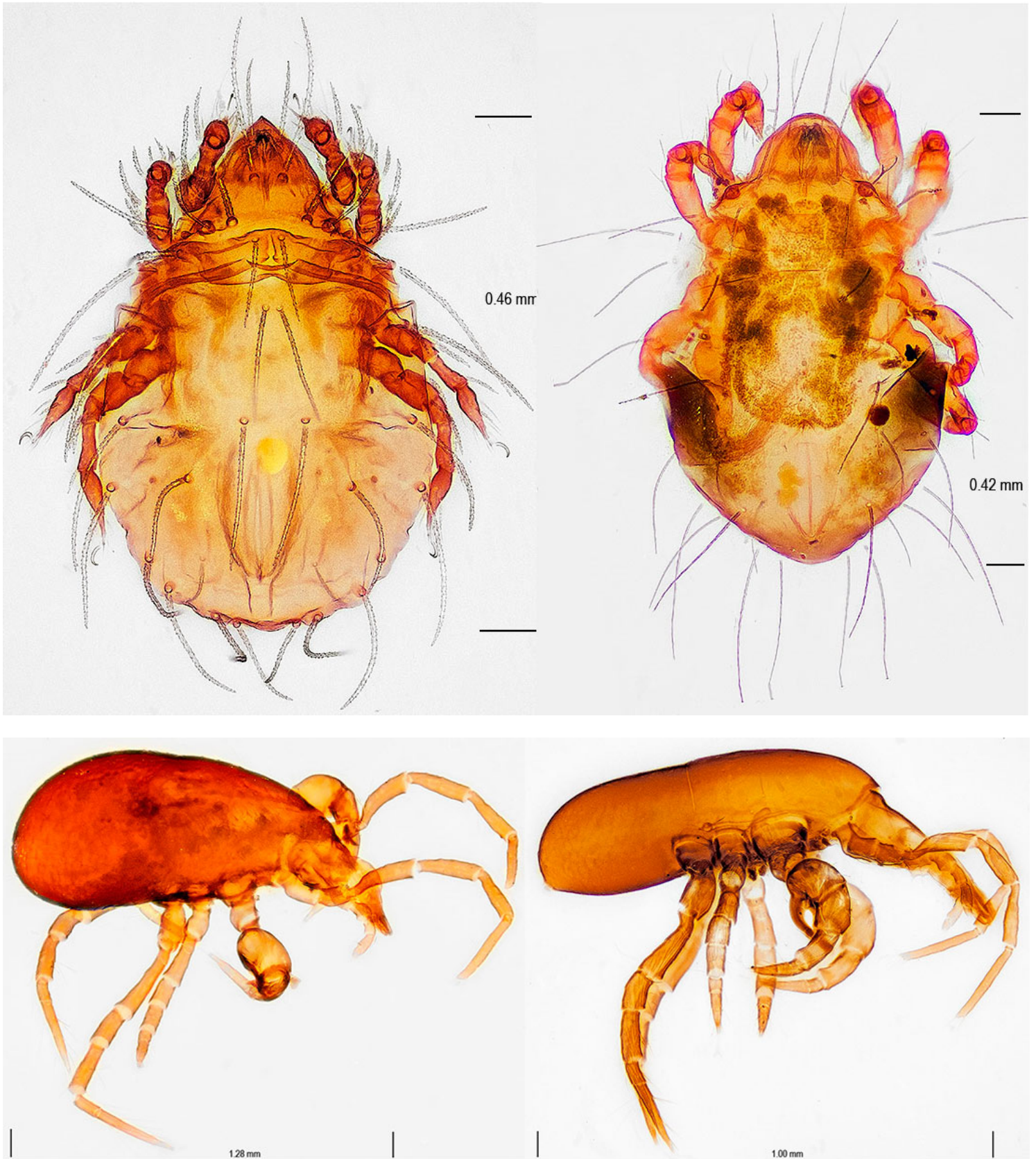


Fig. 15. A Snout Mite.



Fig. 16. Fooled by a beetle; mite left, beetle right.

A selection of other mites in the litter samples are in Fig. 17.







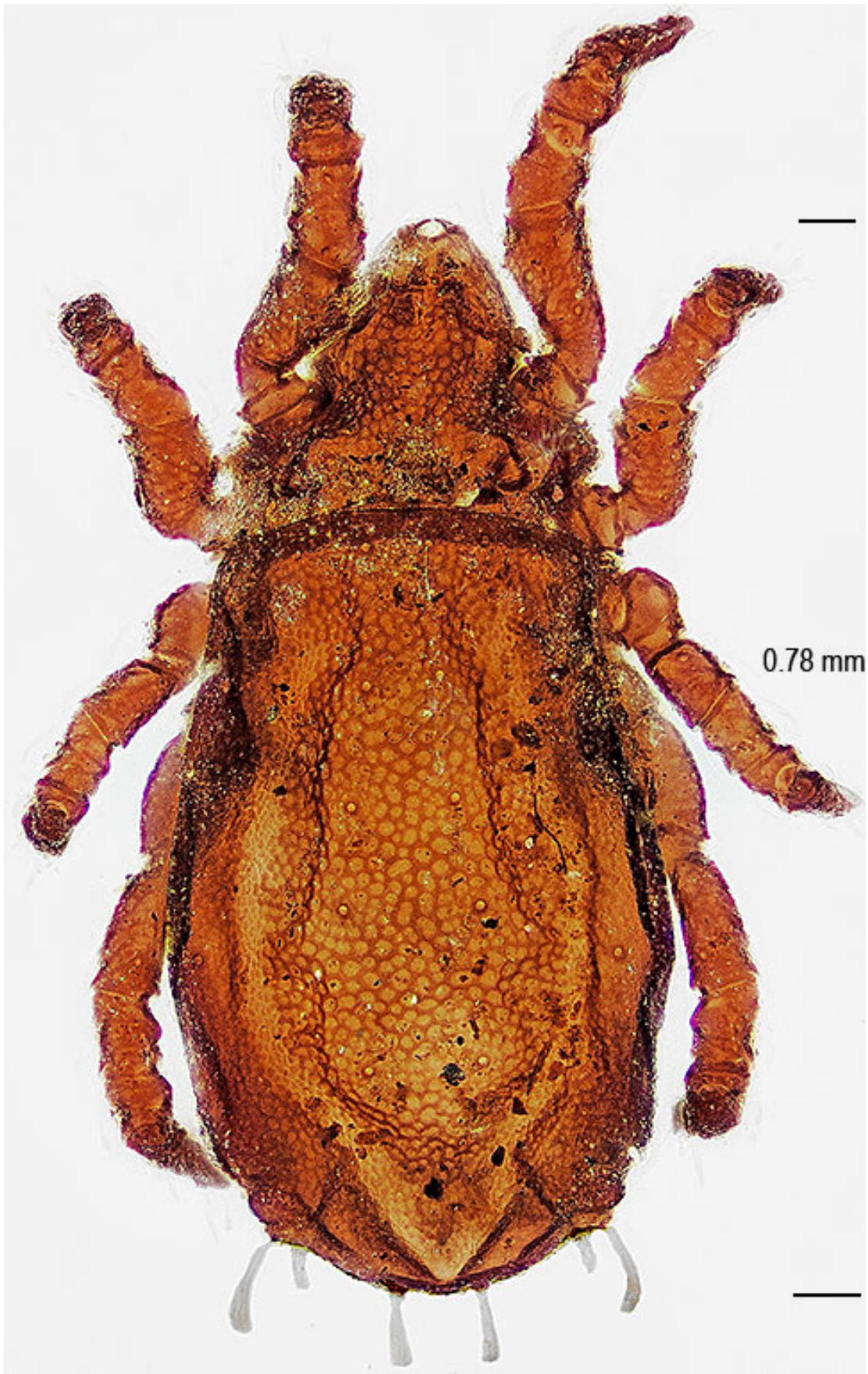


Fig. 17. A selection of mites from the leaf litter

The 1,000 – legged

Not literally, but **Millipede** (from mille = 1,000 and pede = foot) is the common name for Arthropods in the Class: Diplopoda. They do have numerous legs but never reach 1,000. Diplopods is a more descriptive name as it refers to each segment having two pairs of legs; normally in Arthropods there is just one pair per segment. One species of *Polydesmus*, an introduced European species that is common in urban gardens, was found in the samples (Fig. 18).



Fig. 18. Millipede, *Polydesmus* sp., note the two sets of legs (right side showing) on each segment. Total length 15 mm.

Two other more rounded species were found both of which have been introduced from Europe (how did they get into my back yard?); the one on the left is a *Brachyiulus* sp. And the other is *Ophiulus pilosus* (Fig. 19). A close up of the head and few anterior segments show the two pairs of legs on each segment (Fig. 20).

After treatment in 5% KOH the dorsal plates and the 2-legged segments became clearer to see along with the ingested leaf fragments in the gut (Fig. 21). A closer view of one-pair of legs which are more 'delicate', less sclerotized, than insect legs in Fig. 22.



Fig. 19. Two species of millipedes from the leaf litter samples; left is a *Brachyiulus* sp. and the other is *Ophiulus pilosus*.



Fig. 20. Head and anterior segments of *Ophiulus pilosus*

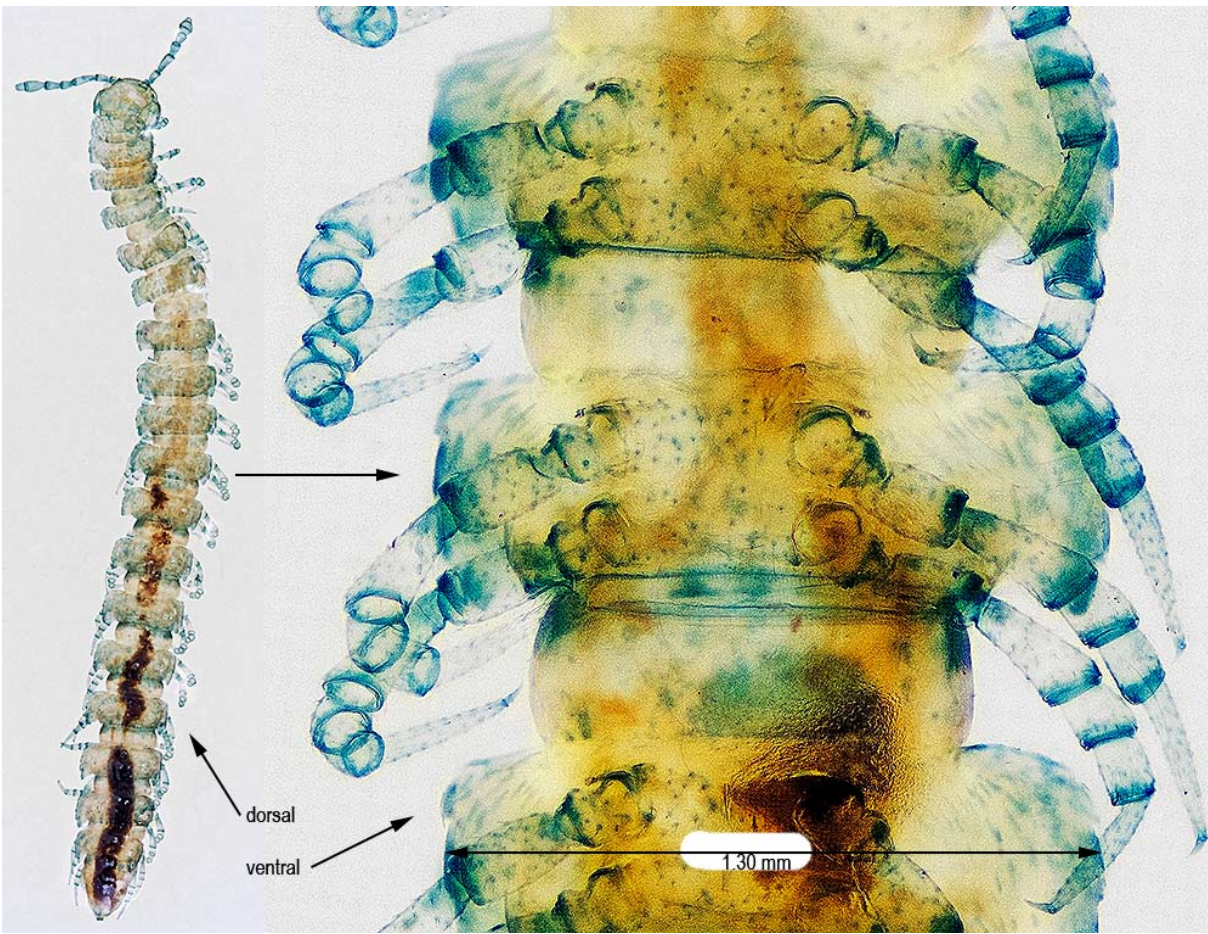


Fig. 21. Dorsal and ventral views of a KOH-treated millipede clearly showing the four legs on each segment.



Fig. 22. One pair of walking legs from one segment of a millipede.

Millipedes gain some protection from would-be predators by their tough integument and by a chemical irritant that is excreted by repugnatorial glands in several segments (Fig. 23).



Fig. 23. Transverse section through body segment of *Ophiulus pilosus* showing repugnatorial glands (black) and the two pairs of legs.

Reference

1] Cloudsley-Thompson, J.L. 1958. Spiders, Scorpions, Centipedes and Mites, The ecology and natural history of Woodlice, 'Myriapods' and Arachnids. Permagon Press. 228pp.

Anthony Thomas PhD, Entomology

Quote – Holmes on 'Entomology'

"I suppose you are an entomologist ? "

" Not quite so ambitious as that, sir. I should like to put my eyes on the individual entitled to that name.

No man can be truly called an entomologist,

sir; the subject is too vast for any single human intelligence to grasp."

Oliver Wendell Holmes, Sr The Poet at the Breakfast Table.

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