

Some Chelate Arthropods

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The very diverse species-rich arthropods are animals with exoskeletons and usually several segmented jointed limbs. They provide a wealth of structures for microscopic examination.

The Arthropoda, a Phylum, is divided into several groups such as insects, crustacea (shrimps, crabs, lobsters), spiders *et al.* Spiders and their close relatives are grouped together as Arachnids and are placed in a sub-phylum Chelicerata. The Chelicerata are characterized by having the 1st pair of appendages, the chelicerae, on the head modified for feeding and defense. This report examines the chelicerae in some of my local species.

Pseudoscorpions

These little guys do look a little bit like tiny scorpions except for size and the lack of a tail stinger. The chelicerae are the tiny pincer-like claws anterior to the mouth and indicated by the arrows in Figure 1; not to be confused with the pair of relatively huge claws, pedipalps, on the 2nd head segment in front of the 4 pairs of legs.

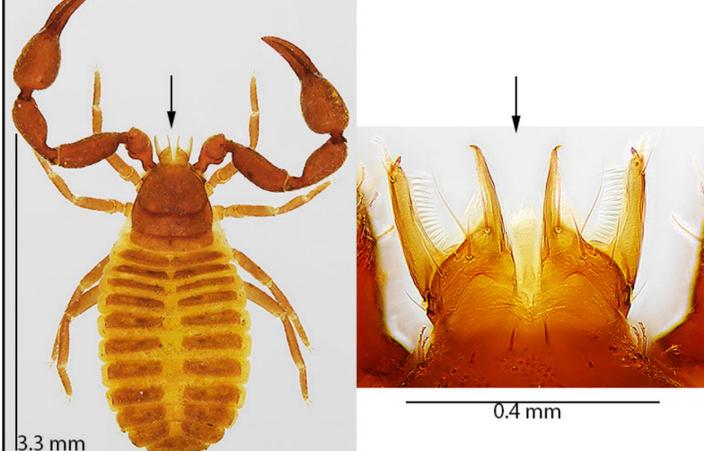


Fig. 1. Pseudoscorpion, dorsal view (left) arrow indicates chelicerae; chelicerae (right).

Harvestmen

These small-bodied, long-legged arachnids look like spiders but are placed in the order Opiliones. Also known as 'Daddy Longlegs' this small fellow was found in my unheated garage in late December. The chelicerae are held vertically and are completely hidden by the pair of huge pedipalps, arrow, on the 2nd head segment in front of the 4 pairs of legs (Figure 2, left). The last segment of each chelicera bears the heavily chitinized toothed 'jaws' which are used to hold prey (Figure 2, right). Figure 3 shows the 'jaws' in more detail. The chelicera rotated slightly between the images.



Fig. 2. Harvestman, dorsal view (left), arrow indicates pedipalps; chelicera (right).



Fig. 3. Harvestman chelicera 'jaws'.

Spiders

Spiders differ from the Pseudoscorpions and Harvestmen in having the opposable terminal segment of each chelicera modified into a fang through which poison is injected into the prey. As in the Harvestmen the chelicerae (Figure 4 left, arrow) are held vertically and are clearly visible when a spider is viewed 'head on'. At rest each poison fang rests in a groove between the two rows of teeth on the basal segment of the chelicera. Fangs 'pulled out' in Figure 4 right. In females the pedipalps on the 2nd head segment (Figure 4 left, p) resemble legs.



Fig. 4. Spider, front view (left) showing vertically held chelicerae and forward projecting pedipalps (p) on 2nd head segment; chelicerae with poison fangs extended (right).

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 D600 with Nikon PB-6 bellows; Nikon flash in place of Olympus' halogen lamp. For reflected light images I use Nikon CF objectives, El-Nikkor enlarging lenses, and a MF 105mm Micro Nikkor with a Nikon D90 camera. Most images are stacks of several frames processed by Zerene Stacker.

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