

Nymph Cove: Identification to Genus: Cordulegastridae and Macromiidae

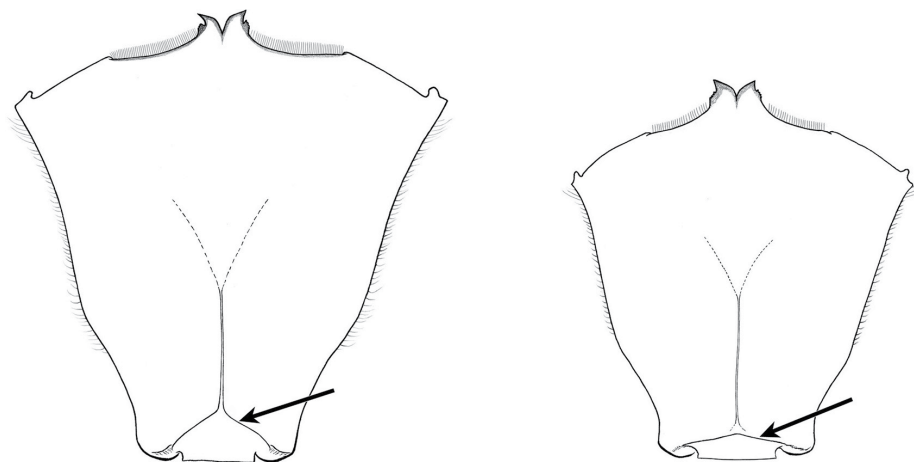


By Marla Garrison and Ken J Tennesen

Cordulegastridae

There are two genera and ten species of cordulegastrids (spiketails) in North America (habitus on page 29). Like the adults, the nymphs are large and robust. They have an elongate, cylindrical, tapering abdomen ending in the sharply tipped, long and acuminate anal pyramid. They lack middorsal hooks. A small posterolateral spine is present on each side of S9 and for most species on S8. In addition, they have divergent wing pads, a broad rectangular head, smallish eyes and a prementum with a ventromedial groove and bifurcated medial process. They are probably best known, though, for their shockingly, deeply-lobed palps producing jagged interlocking teeth.

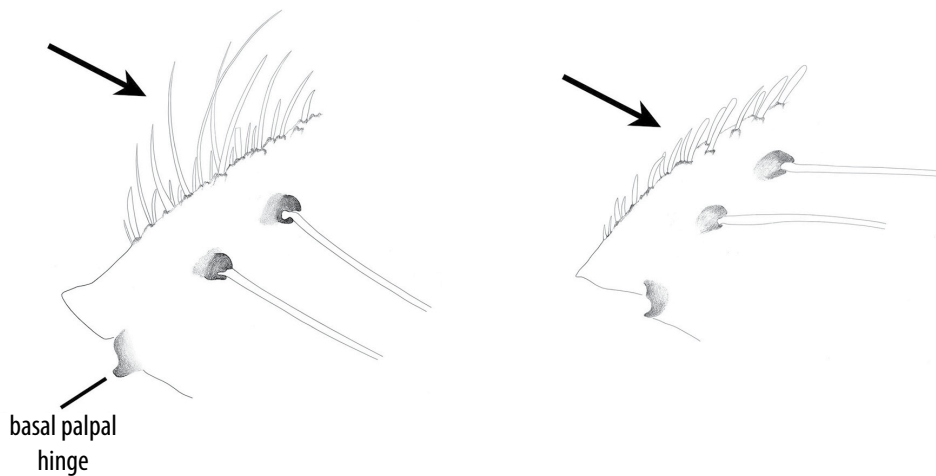
They bury themselves in the sand, silt, and mud of smaller streams and seeps where their hairy bodies ensure they are well concealed in substrate upon extraction. Cleaning them for identification and preservation purposes should be done



Cordulegaster

Zoraena

Figure 1. Cordulegastridae: prementum, ventral view.



Cordulegaster

Zoraena

Figure 2. Cordulegastridae: left palp, setae on basal portion, dorsal view.

carefully, for some of the setae, such as those extending off the anterior edge of the frontal shelf (i.e. a flattened, forward-projecting frontal ridge), can be diagnostic. Our two genera, *Cordulegaster* and

Zoraena, are separated primarily by four characters outlined below.

Firstly, the shape of the transverse suture at the base of the prementum differs

Nymph Cove

between the two, with *Cordulegaster* having a V-shaped suture so that the ventromedial groove originates up off the base whilst in *Zoraena* the suture is straighter and more parallel with the base (Fig. 1).

Secondly, variation occurs in the setae extending off the dorsolateral margin of the palps. In addition to the short setae seen in *Zoraena*, *Cordulegaster* also has long piliform setae present on the dorsolateral rim (Fig. 2).

Thirdly, many stout setae sprout from the frontal shelf in both genera, but long piliform setae are interspersed in different numbers and locations between the two. *Cordulegaster* has a few scattered long thin setae throughout the stouter ones, whereas *Zoraena* has up to a dozen of these longer “hairs” arranged mid-shelf more like a tuft (Fig. 3).

Finally, the S8 posterolateral spine, when present, differs in its degree and direction of curvature. That of *Cordulegaster* is only slightly curved upward with its tip pointing towards, and in line with, the spine on S9. In *Zoraena*, the S8 posterolateral spine is markedly curved upward so that its tip points dorsally and is not in line with that of S9 (Fig. 4).

Macromiidae

Similar to Cordulegastridae, there are two genera and nine species of macromiids (cruisers) in North America (habitus on page 29). Macromiids are the sprawliest nymphs out there, their long legs and flattened bodies perfectly designed for partially burying themselves in soft substrates or clinging to root tangles. The frontal shelf in our North American species has a strong triangular projection. Their body plan, strength and behavior combine to resist dislodging by wave action and strong currents. The two genera that occur in North America are superficially very similar when held in the

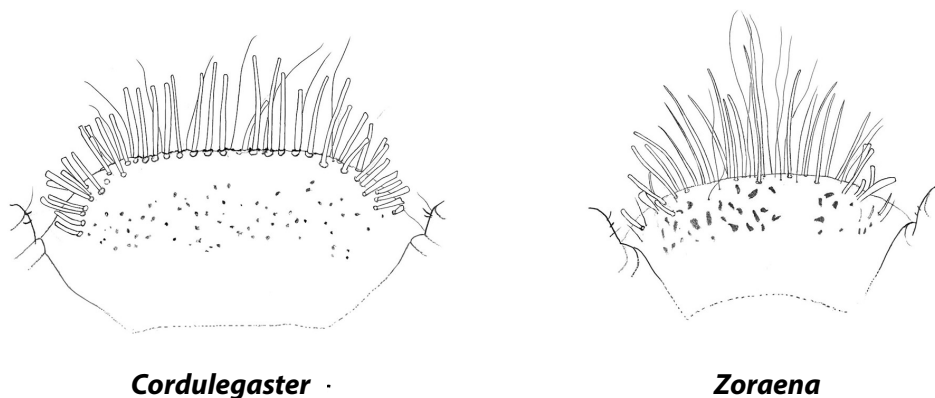


Figure 3. Cordulegastridae: marginal setae on frontal shelf, dorsal view.

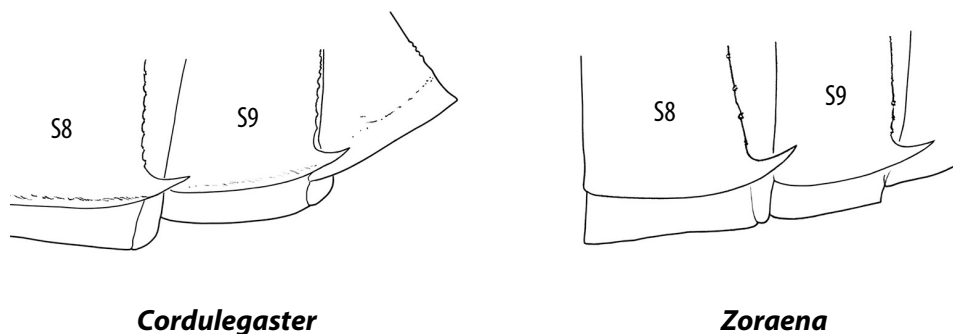


Figure 4. Cordulegastridae: abdominal segments 8 and 9 posterolateral spines, lateral view.

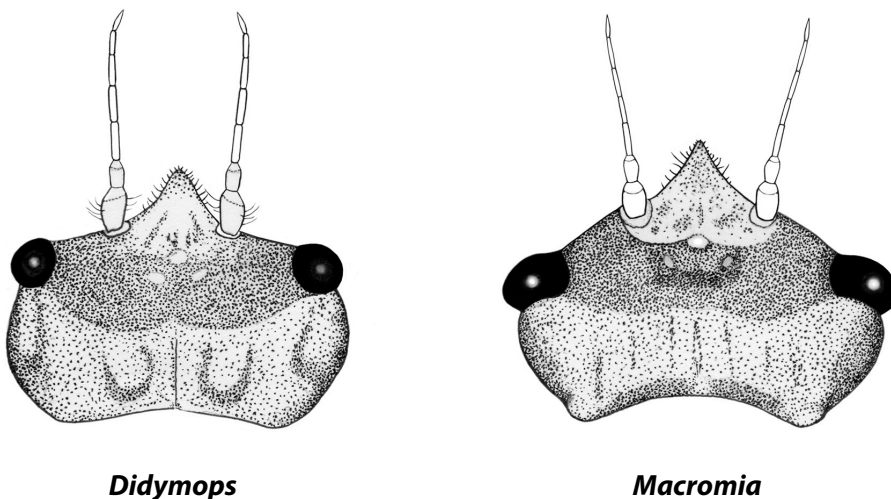


Figure 5. Macromiidae: head, dorsal view.

Nymph Cove

hand, but close examination reveals some nice differences.

The first thing to check is head shape: in *Didymops*, the sides of the head behind the eyes bulge laterally just a bit beyond the edge of the eyes (Fig. 5); in *Macromia*, the sides do not extend laterally beyond the eyes; in other words, the eyes protrude laterally beyond the lateral margins of the head. Also, the head of *Didymops* is less than half the maximum width of the abdomen (at seg. 6), whereas in *Macromia* the head is significantly wider, over 0.6 times the maximum width of the abdomen.

Another character to look at is the profile of abdominal segment 10. In *Macromia*, there is a small mid-dorsal hook that *Didymops* lacks (Fig. 6). If after examining the two previous characters, you are still unsure, you will need to examine the palpal lobes. In *Didymops*, there are usually either three or five long palpal setae versus usually six in *Macromia*. Exceptions are rare. We also see a difference in the small setae along the dorsal rim of the palp: in *Didymops*, these setae extend along the entire length of the rim, all the way to the base of the movable hook; in *Macromia*, the series of dorsal setae ends before the base of the movable hook (Fig. 7). A hand lens is needed to determine these latter character states. Most of these generic characters are

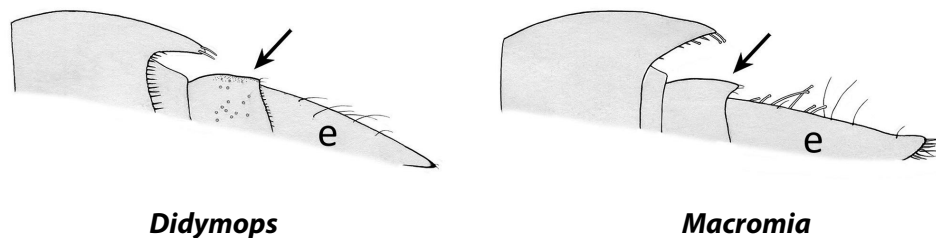


Figure 6. Macromiidae: abdominal segment 10, lateral view, showing middorsal profile; e = epiproct.

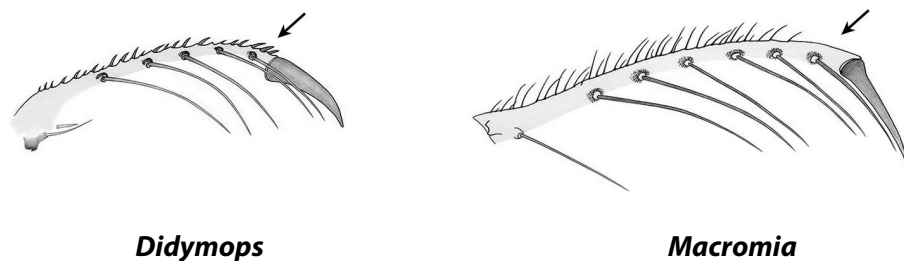


Figure 7. Macromiidae: left palpal lobe, dorsomedial view.

recognizable down to instars as early as F-4 or even F-5. And yeah, if your specimens are from the far West, you don't have to worry about *Didymops*.

Next up, we go in search of the sphynx-like nymphs of the family Petaluridae. Secretive, fantastical and ancient, if you can find 'em they will astound you.

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North American Cordulegasteridae

Habitus Images of the 2 Genera
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Cordulegaster



Zoraena

North American Macromiidae

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Didymops



Macromia