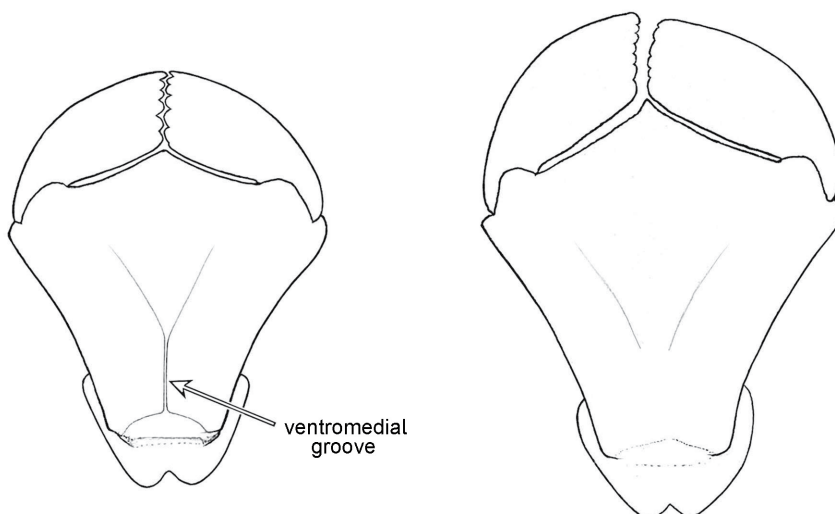
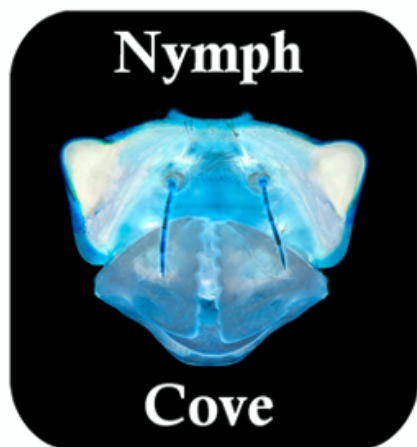


Nymph Cove: IDENTIFICATION TO GENUS: Corduliidae



By Marla Garrison and Ken J Tennesen

Well, Nymph Covers, it's time to take on those glorious corduliids. Nymphs of the family Corduliidae are most similar to those of the family Libellulidae with their smallish eyes, short truncate bodies and relatively long legs and antennae. A primary distinguishing feature, however, is that corduliids have a shallow ventromedial groove on the prementum which libellulids lack (Fig. 1). There are seven genera in North America (four of which are endemics) comprising some 50 species inhabiting aquatic realms from shallow peatlands to large lakes and fast flowing rivers (Fig. 2). We are tackling all seven in this installment. Characters useful for diagnosis include anterolateral sternites, lateral thoracic color pattern, middorsal hooks, posterolateral spines, and palpal details.

Epitheca vs. *Neurocordulia*

Let's begin by setting *Epitheca* and

Figure 1. Prementum of Corduliidae (left) and Libellulidae (right), showing the difference in the ventral surface.



Figure 2. Examples of Corduliidae habitats: A) fen; B) bog-margined lake; C) river; D) small stream.

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Neurocordulia apart from the other five genera due to their lack of an anterolateral sclerite on abdominal segment 8 (Fig. 3). [And if it seems odd to you that *Epitheca* and *Neurocordulia* could be sister genera, compare adults of an *Epitheca* species, such as *E. cynosura*, with an adult of *Neurocordulia michaeli*—the general similarity is astounding.] These two genera also sport prominent abd. seg. 2 middorsal hooks and long abd. seg. 9 posterolateral spines that extend beyond the tips of their cerci. To distinguish between these two genera look for: a well-defined brown longitudinal lateral thoracic stripe; absence of an abd. seg. 6 anterolateral sclerite; and, nine to ten moderately high distal palpal crenations, all of which denote the genus *Epitheca* (Fig. 4). *Neurocordulia* usually lacks this dark thoracic “vest” pattern (an obscure dark area can be seen in recently molted nymphs), has an abd. seg. 6 anterolateral sclerite, and produces seven or eight taller distal palpal crenations (Fig. 4).

It bears mentioning that, although corduliids in general have a somewhat protruding frontoclypeal ridge, one species of *Neurocordulia*, *N. molesta*, has quite an exaggerated triangular frontal shelf (as seen in the habitus at the end of this article) somewhat similar to those of the family Macromiidae.

Now let’s consider the remaining five genera, all of which have a small anterolateral sclerite on the venter of abd. seg. 8 but lack an abd. seg. 2 middorsal hook.

Williamsonia

Location, location, location. Nymphs of the geographically restricted North American endemic genus, *Williamsonia*, inhabit poor fens where they are found intermittently hidden in shallow *Sphagnum* pools between hummocks. In these authors’ opinions they are about the most adorable nymph you can find on the planet. Petite and compact in their final instar, they bear a pale

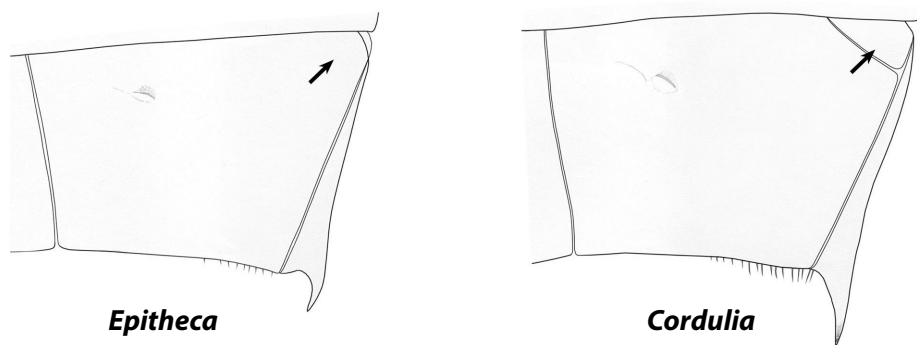


Figure 3. Abdominal segment 8 venter, showing lack of anterolateral sclerite in *Epitheca* vs. presence in *Cordulia*.

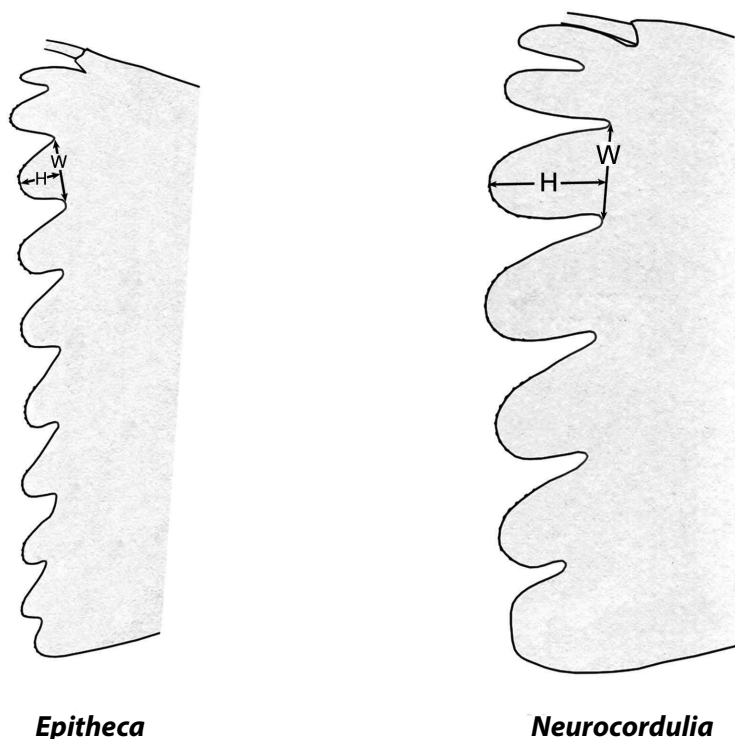


Figure 4. Distal margin of palpal lobe, showing difference in height of lobes between *Epitheca* and *Neurocordulia*.

middorsal abdominal stripe, much like the midvein of a dead leaf of leatherleaf, detritus amidst which they are beautifully camouflaged in a dip net. Although this middorsal line may be seen to some extent in *Dorocordulia* and *Cordulia*, it is quite remarkable in *Williamsonia*.

Their distinguishing characteristics include a well-produced frontoclypeal ridge extending beyond antennomere 1 (antm 1), premental and lateral palpal rugae (ie. corrugations or wrinkling on

the ectal surface) and short setae (but no spinules) on the lateral margin of abd. seg. 8 (Fig. 5). Unlike the most similar *Dorocordulia*, *Williamsonia* nymphs have middorsal hooks on abd. segs. 3 and 4.

Cordulia, Dorocordulia, Helocordulia, and Somatochlora

The remaining four genera all have a smooth lateral palpal surface, a frontoclypeal ridge that extends no further than mid-length of antm 1, and long setae

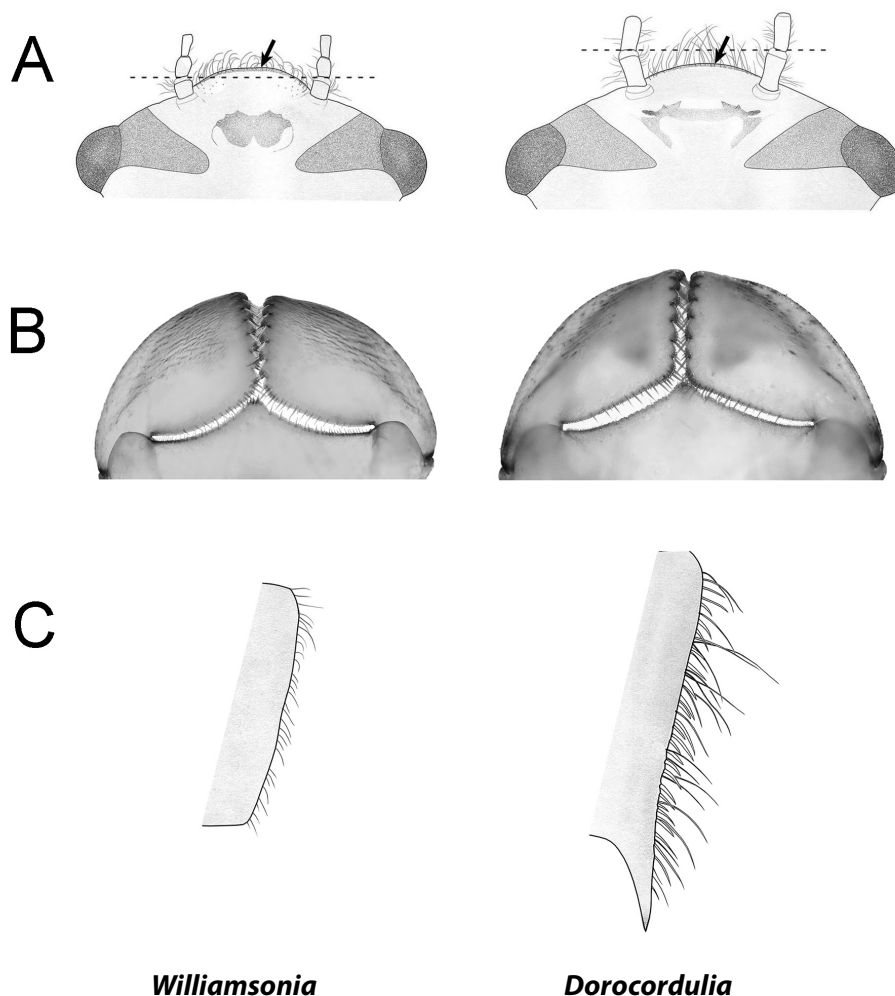


Figure 5. Comparison of *Williamsonia* and *Dorocordulia*: A) frontoclypeal ridge relative to antennal segment 1; B) ectal surface of palpal lobes; C) lateral margin of abd. seg. 8.

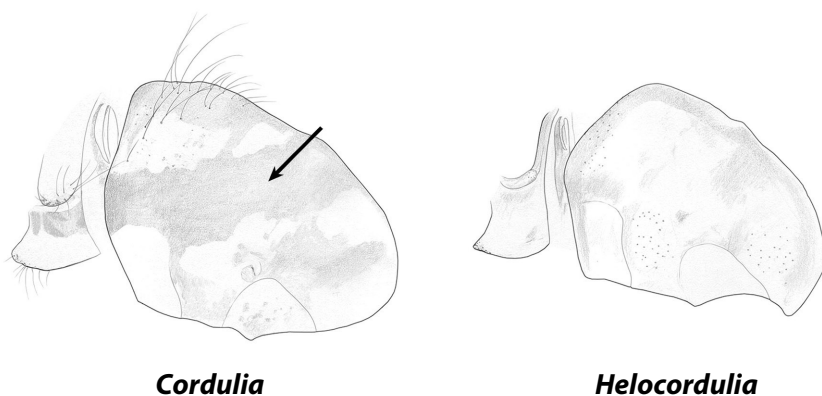


Figure 6. Thoracic side of *Cordulia* and *Helocordulia* showing difference in color pattern.

and/or spinules on the lateral margin of abd. seg. 8 (Fig. 5).

To separate them we must first look at the side of the thorax and the dorsum of the abdomen. If a wide dark brown longitudinal stripe is present on the lateral thorax and a medial pattern of pale blotches with dark accents on abd. segs. 7–9 then it is either *Cordulia* or *Dorocordulia*. If the side of the thorax and the dorsum of the apical abdominal segments are more uniform in coloration then it is either *Helocordulia* or *Somatochlora* (Fig. 6).

Cordulia* vs. *Dorocordulia

Both of these genera tend to inhabit organic-rich pond and lake margins where much detritus is accumulated. Their nymphs are similar in body shape and color pattern (dark stripes, blotches and a pale median middorsal line on abdomen) as well as having short posterolateral spines on abd. segs. 8 and 9. *Cordulia* nymphs are somewhat larger, our North American species completely lacks middorsal hooks, and they have a premental width greater than 5 mm, thus setting them apart from *Dorocordulia* which has at least small middorsal hooks on abd. segs. 6 and 7 (sometimes even on the adjacent segments) and a premental width less than 4 mm (Fig. 7). The middorsal hooks of *Dorocordulia* can appear as slight bumps so, close examination of the abdominal profile is warranted.

Helocordulia* vs. *Somatochlora

Unlike *Cordulia* and *Dorocordulia*, *Helocordulia* and *Somatochlora* lack the dark stripes on the thorax; in addition, the abdominal pattern is not blotched (the exception being *S. cingulata* which has striking abdominal patterning) and they lack a pale middorsal abdominal line.

In general, *Helocordulia* are more “naked” by comparison to *Somatochlora*, lacking

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the setae that sprout from the rear margin of the compound eye, the dorsolateral rim of the prementum and the thorax, and wing sheaths of most *Somatochlora*. Middorsal hooks, though, are the main feature to consider when attempting to separate the two genera. Diagnosis using this character can be a bit tricky given the variability that occurs within each group so, careful attention must be paid. First, all *Helocordulia* have middorsal hooks on abd. segs. 6–9 but lack a middorsal hook on abd. seg. 5 (Fig. 8). The middorsal hook on abd. seg. 6 can be very small while those on segs. 7–9 are usually relatively large. About half of our North American *Somatochlora* species, on the other hand, completely lack middorsal hooks (almost all of these species are lentic). On those species where they are present (all the lotic species), abd. seg. 5 has a prominent middorsal hook (segs. 3 and 4 may also have small hooks in these species) (Fig. 8). To summarize, if middorsal hooks are present on abd. segs. 6 or 7 but not on seg. 5, then think *Helocordulia*. If abd. seg. 5 has a middorsal hook or, if there is a complete absence of middorsal hooks, then target *Somatochlora*.

Well done for diving this deep into Nymph Cove. We're about halfway through the Anisoptera . . . in the next ARGIA, Cordulegastridae & Macromiidae!

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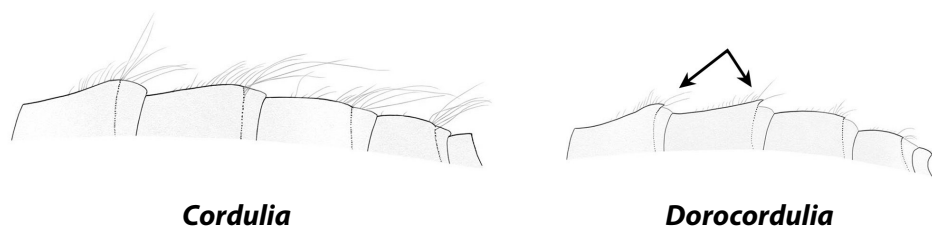


Figure 7. Abdominal profile (dorsum of segments 6–10) of *Cordulia* and *Dorocordulia* showing difference in middorsal hooks.

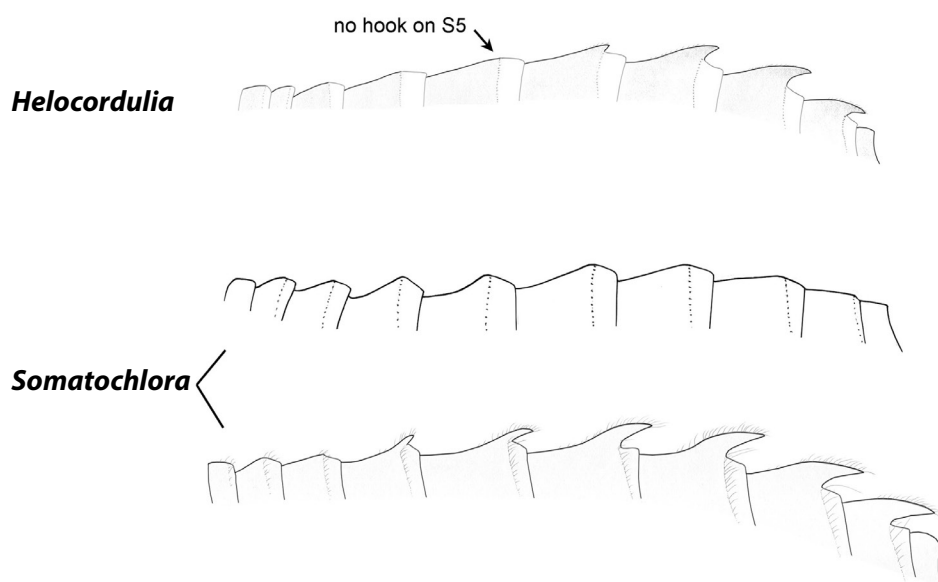


Figure 8. Abdominal profiles of *Helocordulia* and *Somatochlora*, showing difference in middorsal hooks.

North American Corduliidae

Habitus Images of the 7 Genera

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Cordulia



Dorocordulia



Epithea
(Subgenus *Epicordulia*)



Epithea
(Subgenus *Tetragoneuria*)



Helocordulia



Neurocordulia



Williamsonia



Somatochlora
(*S. arctica* Group)



Somatochlora
(*S. tenebrosa* Group)