



ARGIA

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Identifying Odonata Nymphs to Family



*Wisconsin Ode nymphs,
time travelers, under water,
next phase— overlords
-K.J. Tennessen, 2021*

*abandoned on the dock,
luggage, unpacked by cruisers
eager to take flight
-M.C. Garrison, 2021*

By Marla C. Garrison and
Ken J. Tennessen

Spring is right around the corner and that means it is time to learn how to identify Odonata nymphs. First, to be sure everyone knows how to tell a dragonfly nymph from a damselfly nymph (and forgive us for insulting anyone’s intelligence), dragonfly nymphs have five short, stiff appendages at the posterior end of the abdomen, collectively called the **anal pyramid**, while damselfly nymphs have two short appendages plus three elongated appendages, usually in the form of **caudal lamellae**. Also, the abdomen of dragonfly

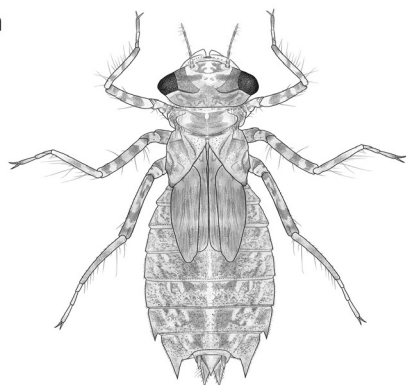
nymphs is wide and spindle-shaped compared to the narrow cylindrical abdomen of damselfly nymphs (Fig. 1).

To identify Odonata nymphs beyond suborder, some brief (so don’t panic) morphology and terminology is necessary. The labium is the odonate nymph’s prey snatching organ; it also performs like a lower lip to hold and manipulate prey during ingestion. The main portion of the labium is the **prementum**, which has at its distal end two highly variable **palpi**. The shape of the prementum is one of the key characters to facilitate identifying Odonata nymphs and is the first thing to look at when trying to differentiate the families. It is flat in some families and scoop-shaped in others (Fig. 2). The palpi attached to a flat prementum are also flat or bladelike, whilst the palpi associated with a scoop-shaped prementum, are themselves scoop-shaped. Philip Corbet once analogized that one is like a dinner tray, the other like a spoon!

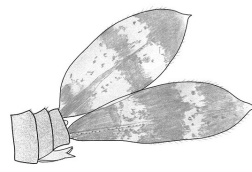
Dragonfly Nymph
(Anisoptera)



anal pyramid



Damselfly Nymph
(Zygoptera)



caudal lamellae

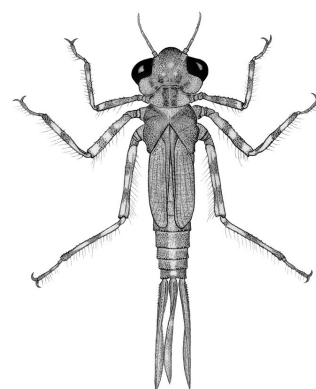


Figure 1. Suborders of Odonata Nymphs (left: Anisoptera, posterior abdomen dorsal view and whole nymph dorsal view; right: Zygoptera, posterior abdomen lateral view and whole nymph dorsal view). ©K.J. Tennessen, 2021

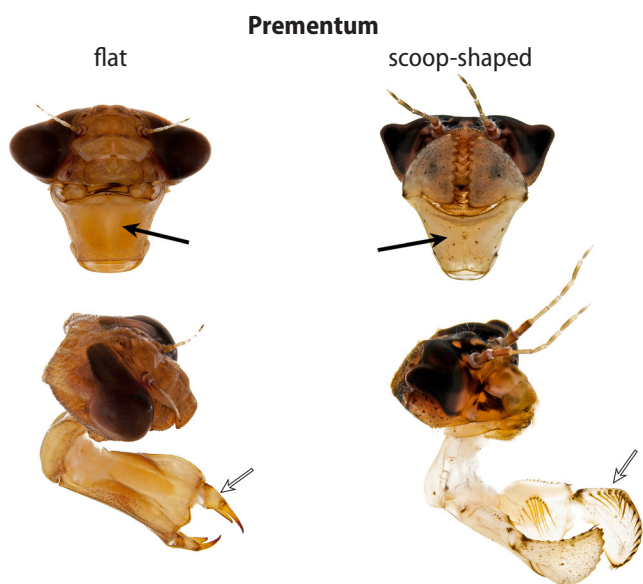


Figure 2. Flat vs. Scoop-shaped Prementum (top images: retracted labium, anteroventral view; bottom images: protracted labium, dorsolateral view) Note: black arrows indicate prementum; clear arrows indicate left palpus. ©M.C. Garrison, 2021

To get to the family level, we need to first examine the prementum. The following keys are practical in the field with a hand lens.

ANSIOPTERA (dragonfly) KEY:

- 1a. If the prementum is essentially flat, we have one of three families: **Aeshnidae**, **Gomphidae**, or **Petaluridae**, move on to 2.
- 1b. If the prementum is scoop-shaped, we have one of four families: **Cordulegastridae**, **Macromiidae**, **Corduliidae**, or **Libellulidae**, move on to 3.

If the prementum is flat, we need to look at the antennae (Fig. 3):

- 2a. If the antennae have only 4 segments, it is **Gomphidae**.
- 2b. If the antennae are 6- or 7-segmented and slender, it is **Aeshnidae**.
- 2c. If the antennae are 6- or 7-segmented and thick, it is **Petaluridae**.

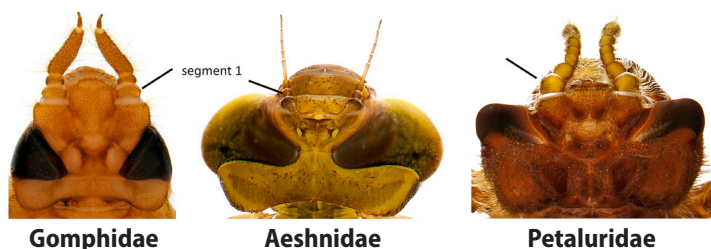


Figure 3. Antennal Segments of Odonata Families with Flat Prementums (left: Gomphidae; middle: Aeshnidae; right: Petaluridae). ©M.C. Garrison, 2021

If the prementum is scoop-shaped, look at the front of the head (Fig. 4):

- 3a. If a horn is present, it is **Macromiidae**.
- 3b. If a horn is not present, move on to 4.

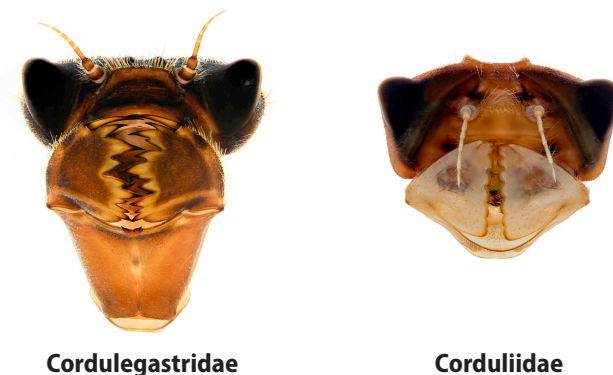


Macromiidae

Figure 4. Frontal Horn, Family Macromiidae (left: anterior view; right: dorsal view). ©M.C. Garrison, 2021

If no horn is present than consider the palpal teeth (Fig. 5):

- 4a. If the palpi have large, jagged, uneven teeth, it is **Cordulegastridae**.
- 4b. If the palpi have small, even teeth, move on to 5.



Cordulegastridae

Corduliidae

Figure 5. Palpal Teeth (left: family Cordulegastridae, anterior view; right: family Corduliidae, anterior view). ©M.C. Garrison, 2021

If the palpal teeth don't remind you of *Jaws* the movie, then look at the underside of the prementum for a midline groove (Fig. 6):

- 5a. If the underside of the prementum has a groove down the middle, it is **Corduliidae**.
- 5b. If the underside of the prementum does not have a groove down the middle, it is **Libellulidae**.

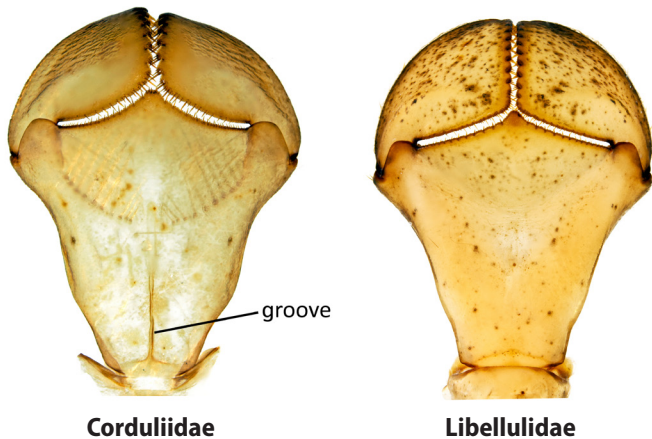


Figure 6. Prementum, Ventral View (Left: Corduliidae with median groove; Right: Libellulidae without median groove. ©M.C. Garrison, 2021

In our next installment, we intend to showcase **your** nymph stories and/or questions. We want to know if you've had an interesting field experience with a nymph (of the odonate variety that is) or observed some unique nymph behavior, morphology or habitat. Maybe you even had a startling, or at least relatable, experience keying out nymphs? Send us your comments, ideas, tales, observations and inquiries ASAP and we'll put them in the next Nymph Cove. Contact information below.

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Ken Tennessen has published over 80 technical papers on Odonata. His recent book, Dragonflies Nymphs of North America, was published by Springer in 2019.

ZYGOPTERA (damselfly) KEY:

- 1a. If the prementum has a large opening at the distal end (the ligula), it is **Calopterygidae**.
- 1b. If the prementum is very elongated and stalked, it is **Lestidae**.

If neither of the above, move to 2.

- 2a. If the prementum is widest at the distal end, it is **Coenagrionidae**.
- 2b. If the prementum is widest nearer the proximal end, it is **Platystictidae**.

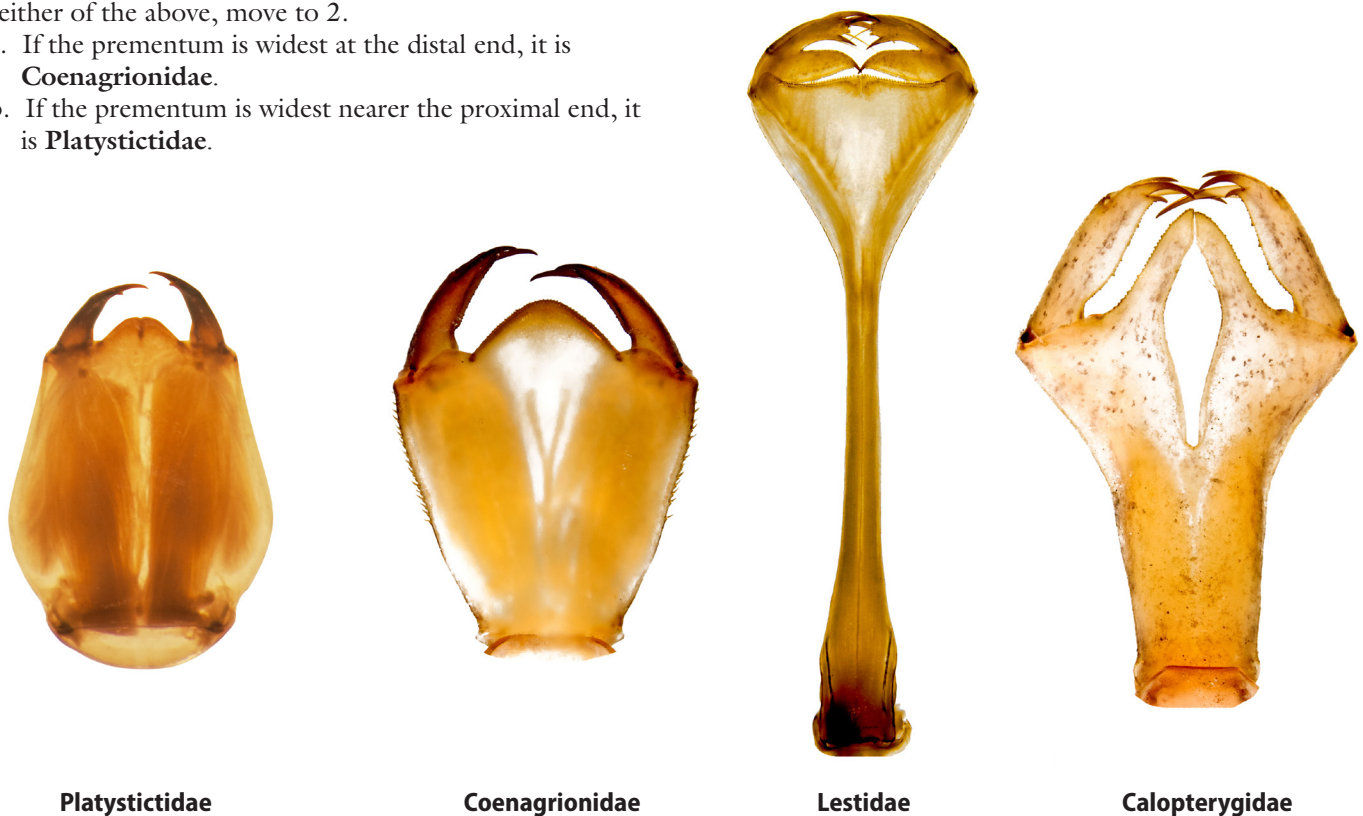


Figure 7. Suborder Zygoptera, Prementum, Ventral View, families Platystictidae, Coenagrionidae, Lestidae, and Calopterygidae. ©M.C. Garrison, 2021

ARGIA
and
Bulletin of American Odonatology

Call for Submissions

The DSA welcomes proposals for articles on most any topic related to Odonata for our quarterly news journal, *ARGIA*, or our occasional peer-reviewed journal, *Bulletin of American Odonatology* (*BAO*). Topics should be generally consistent with the DSA mission.

Inquires about *ARGIA* proposals should be directed to its editor, Amanda Whispell, at editor@dragonflysocietyamericas.org.

For *BAO* proposals, contact its editor, Steve Hummel, at editorbao@dragonflysocietyamericas.org.

Authors preparing articles should consult our [Submissions Guidelines](#) and include a completed [Submission Form](#) when submitting your articles; both are available on the DSA website:

www.dragonflysocietyamericas.org/instructions-to-authors.

Back cover:

Great Spreadwing (*Archilestes grandis*) pair in tandem;
Mike Murphy Ranch, Travis Co., Texas; 3 June 2016.

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