AN UPDATE TO THE UPDATE!!

29 November 2025

was:

FLORIDA WATER BEETLES: AN UPDATE

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It has been 15 years since the publication of Epler's "The Water Beetles of Florida. An Identification Manual for the Families Chrysomelidae, Curculionidae, Dryopidae, Dytiscidae, Elmidae, Gyrinidae, Haliplidae, Helophoridae, Hydraenidae, Hydrochidae, Hydrophilidae, Noteridae, Psephenidae, Ptilodactylidae and Scirtidae". Of course, much has happened in that time. In this workshop/workbook, we'll discuss some of these changes (beetles are arranged alphabetically by family), and we'll all look at some nifty water beetles!

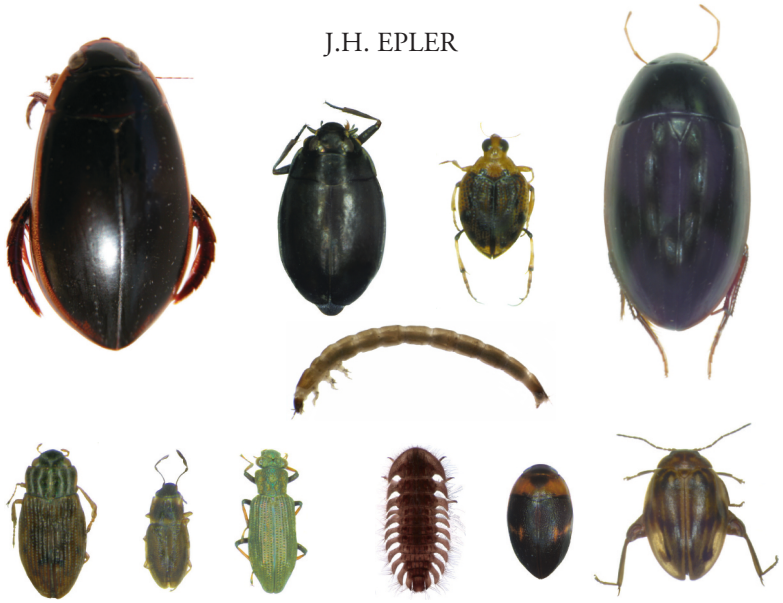


THE WATER BEETLES OF FLORIDA

an identification manual for the families

CHRYSOMELIDAE, CURCULIONIDAE, DRYOPIDAE, DYTISCIDAE,
ELMIDAE, GYRINIDAE, HALIPLIDAE, HELOPHORIDAE,
HYDRAENIDAE, HYDROCHIDAE, HYDROPHILIDAE,
NOTERIDAE, PSEPHENIDAE, PTILODACTYLIDAE
and SCIRTIDAE

J.H. EPLER

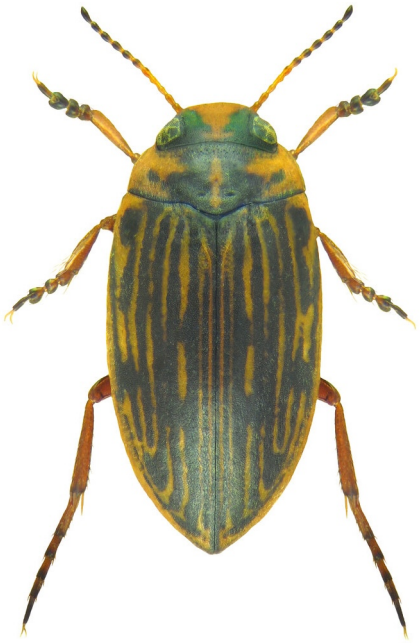


DYTISCIDAE

Boreonectes. The genus ***Stictotarsus*** is not known from Florida. Because it is recorded from South Carolina and there is thus a possibility it may occur here, I included the genus, represented by the widespread taxon *S. griseostriatus* (De Geer), in my key to genera of dytiscid adults (p. 5.26) of Florida. It has long been known that this taxon is notable for its variation and is most likely a complex of species, especially in Europe. Now this taxon has been established as a new genus, *Boreonectes* (see Angus 2010). Thus, the species' name is now *Boreonectes griseostriatus* (De Geer). Given the variability of this taxon, it is most likely that at least one of the "variants" known from North America actually represents an undescribed species, so stay tuned.

Also note that some other Nearctic *Stictotarsus* are now included in *Boreonectes*. These are:
B. aequinoctialis (Clark), *B. coelamboides* (Fall), *B. dolerosus* (Leech), *B. expositus* (Fall), *B. funereus* (Crotch), *B. panaminti* (Fall) (tentative placement), *B. spenceri* (Leech) and *B. striatellus* (LeConte).

Boreonectes may be separated from *Stictotarsus* by the shining ventral surface of the head behind the eyes, with only superficial reticulation (closely punctate in *Stictotarsus*).



Boreonectes griseostriatus
(photo by Udo Schmidt)



Derovatellus floridanus

Derovatellus. Miller (2005) reinstated *Derovatellus floridanus* as a full species.

The taxonomy of the tribe **Hygrotini** has been updated. Miller & Bergsten (2016) had reinstated ***Coelambus*** as a full genus and included *Hygrotus berneri* Young & Wolfe and *H. nubilus* (LeConte) in it. But more recent work by Villastrigo et al. (2017) has established new genera and subgenera within the tribe. Thus, in Florida, we now have ***Clemnius (Clemnius)*** *berneri* (Young & Wolfe), ***Clemnius (Cyclopius)*** *marginipennis* (Blatchley) and ***Hygrotus (Leptolambis)*** *nubilus* (Le Conte).

Note also that "*nubilus*" was misspelled in the manual.



Hygrotus nubilus



Hydaticus (Prodaticus) bimarginatus

Hydaticus. Miller & Bergsten (2016) have reduced ***Prodaticus*** to subgeneric status within *Hydaticus*. Thus our most common species is now *Hydaticus (Prodaticus) bimarginatus* (Say).

The genus ***Laccomimus*** has been established by Toledo & Michat. This genus replaces ***Laccodytes*** Régimbart for the single species known from Florida, now known as *Laccomimus pumilio* (LeConte). See Toledo & Michat (2015).



Laccomimus pumilio

Meridiorhantus. The species formerly known as *Rhantus calidus* (Fabricius) is now placed in the new genus ***Meridiorhantus***. Thus it is now known as *Meridiorhantus calidus* (Fabricius). See Balke et al. (2017).



Meridiorhantus calidus



Metaxydytes, The Cybistrinae have been revised and the sole Florida species in the genus ***Megadytes*** has been moved to the genus ***Metaxydytes***. Thus we now have ***Metaxydytes fraternus*** (Sharp). See Miller et al. (2024)

Uvarus. *Uvarus* sp. 1 Epler has been described as *Uvarus sinofelihelianthus* Epler; see Epler (2020). It is recorded only from a few localities in Alachua, Columbia, Manatee and Union Counties in Florida (the New and Santa Fe Rivers).



ELMIDAE

Kamite (2016) had synonymized ***Promoresia*** with ***Optioservus***. Later, Kobayashi et al. (2021) synonymized ***Gonielmis*** and *Optioservus* with ***Heterlimnius***. Thus we now have three species of *Heterlimnius* recorded from Florida: *H. dietrichi* (Musgrave), *H. ovalis* (LeConte) and *H. tardellus* (Fall).



Heterlimnius dietrichi



Heterlimnius ovalis



Heterlimnius tardellus



H. dietrichi



Heterlimnius sp.



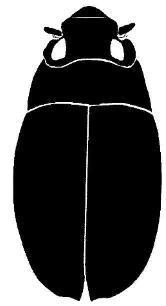
H. tardellus

GYRINIDAE

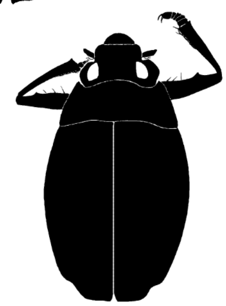
I have been too slow in getting out a corrected version of page 7.7 in the Gyrinidae chapter. This updated version now includes ***Dineutus shorti*** in the key, and notes concerning the species in Florida. This species was described in 2015, and I added it to the checklist for Florida back then. The next two pages provide an update to the *Dineutus* key to accommodate *D. shorti*.

6(5') Venter brownish-yellow 7
6' Venter black/dark brown 8

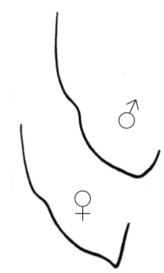
7(6) Form narrowly oval; median lobe of aedeagus and parameres narrower; average size smaller, 9.0-10.5 mm; elytral apices produced into a point in both sexes, posterolateral margins only slightly sinuate…………………………………………….... ***D. angustus***




7' Form elongate-oval; size larger, 10.5-13.0 mm; median lobe of aedeagus broader; posterolateral margins of elytra weakly to strongly sinuate, apices pointed or not ……….,,,,,,,,,,,,,,………..…… 7A



7A(7')Median lobe of aedeagus extends to tip of parameres; posterolateral margins of elytra strongly sinuate; male mesotarsal claws smoothly curved to apex ………………….………… ***D. discolor***

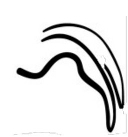





(figs. adapted from Gustafson & Sites 2015)

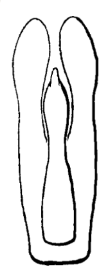
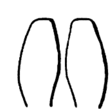
7B Median lobe of aedeagus shorter than parameres; posterolateral margins of elytra weakly sinuate; male mesotarsal claws with small medial tooth before apex ……………….……………….……….… ***D. shorti***



(figs. adapted from Gustafson & Sites 2015)

8(6') Smaller, 9-10 mm; male fore femur toothed; aedeagus as figured, median lobe much shorter than parameres; female gonocoxae elongate-oval with truncate apices ……………. ****D. productus***

(figs. adapted from Wood 1962)

8' Larger, 10-12 mm; male fore femur without tooth; median lobe of aedeagus longer (see figs. below); female gonocoxae broader or with rounded apices ……………………………………….. 9




* indicates taxon not known from Florida

Revised page 7.9 +

Additional Notes on species

D. shorti - Length 10.4-12.3 mm. This is a new species recently described by Gustafson & Sites (2015). It is known only from Okaloosa, Santa Rosa and Walton Counties in FL, and Covington Co. in Alabama. It is very similar to D. discolor and was confused with it by me as a possible variant of *D. discolor* (Epler 2010) - in fact, I used a photo of the male genitalia of *D. shorti* in the key (p. 7.9, couplet 7') for the genitalia of *D. discolor*! See also Grey Gustafson's excellent recent revision of *Dineutus*: Gustafson & Miller (2015).

Additional References

Gustafson, G.T. & K.B. Miller. 2015. The New World whirligig beetles of the genus *Dineutus* Macleay, 1825 (Coleoptera, Gyrinidae, Gyrininae, Dineutini). Zookeys 476: 1-135.

Gustafson, G.T. & R.W. Sites. 2015. A North American biodiversity hotspot gets richer: a new species of whirligig beetle (Coleoptera: Gyrinidae) from the southeastern United States. Annals of the American Entomological Society 109: 42-48.

HYDROCHIDAE

The species of ***Hydrochus*** have been reviewed for Mississippi (Worthington et al. 2016). As a result, several of my letter-designated taxa now have "real" names.

H. sp. 1 = *H. falsus* Hellman
H. sp. 2 = *H. jiawanae* Makhan
H. sp. 5 = *H. pajnii* Makhan
H. sp. 6 = *H. schereri* Makhan
H. sp. 8 = *H. jaechi* Makhan.



Hydrochus rugosus

HYDROPHILIDAE

Crenitulus has been considered a synonym of ***Anacaena*** for some time, but was recently reinstated as a full genus by Fikáček & Vondráček (2014). Recent work by Fikáček & Vondráček (2014) and Archangelsky & Fikáček (2004) has provided a better understanding of the separation of the larvae of *Anacaena*, *Crenitulus* and *Paracymus.*

Komarek (2005) separated the widespread (Canada to Argentina) *Anacaena suturalis* and four other Neotropical species into a "*suturalis*-group"; Fikáček & Vondráček (2014) reinstated the name *Crenitulus* for this group. It is doubtful that *Anacaena* occurs in Florida, but the single possible species, *A. limbata* (Fabricius), is keyed on p. 12.17. Just remember that the first taxon keyed there is now called *Crenitulus suturalis* (LeConte).

Archangelsky & Fikáček (2004) found that the larvae of *Anacaena* and *Paracymus* have been misidentified for a considerable time, going back to Richmond (1920), who interchanged the larval descriptions of the two genera. Other authors had followed suit; see Archangelsky & Fikáček (2004) for a more complete listing of these errors. Note that the larva described as *Paracymus subcupreus* in Archangelsky (1997: 124-125) is that species, but the larva illustrated as"*Anacaena infuscata*" (pp. 130-131) is a *Paracymus*. Thus my couplet 18 (Epler 2010: 12.8) just keys *Paracymus* twice!

An additional caveat - do not confuse *Crenitulus* with *Crenitis* Bedel, a genus that does not occur in Florida.



Anacaena limbata

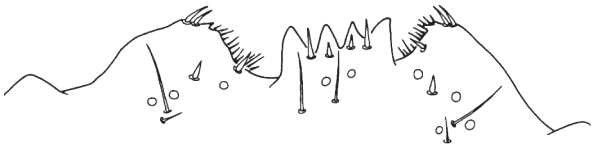


Crenitulus suturalis

A corrected key separating the larvae of Anacaena, Crenitulus and Paracymus is provided on the next page.

Replace couplet 18 on page 12.8 with the following:

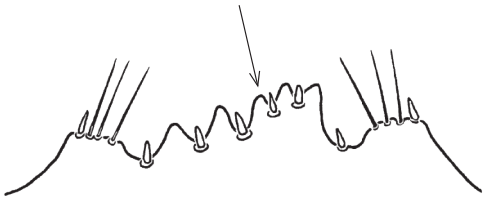
18(17) Anterior margin of clypeolabrum with 3-4 teeth ..... ***Paracymus***



(adapted from Archangelsky 1997)

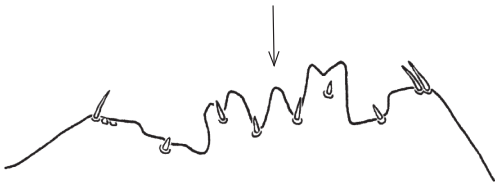
18' Anterior margin of clypeolabrum with 5 teeth (see figures below) 18A

18A(18') Clypeolabral tooth row with median tooth appressed to the 2 teeth to its right ..... ***Crenitulus***



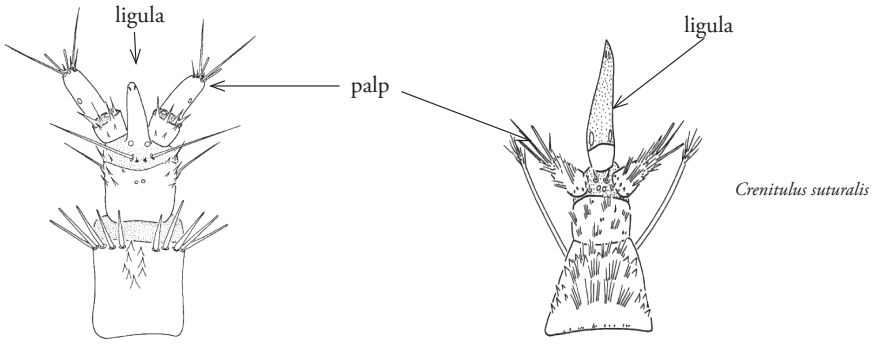
(adapted from Fikáček & Vondráček 2014)

18B Clypeolabral tooth row with median tooth separate from each group of lateral teeth ..... * ***Anacaena***



(adapted from Fikáček & Vondráček 2014)

Note also that the ligula on the labium may be longer OR shorter than the labial palpi in *Crenitulus* AND some *Paracymus* (e.g. *P. rufocinctus* Bruch, a South American species)



(adapted from Archangelsky 1997) (adapted from Archangelsky & Fikáček 2004)

* indicates taxon not known from Florida

Helochares has been split (see Girón & Short 2021) and Short & Girón (2023)). *Helochares maculicollis* Mulsant remains the same but our other species, *H. sallaei*, is now placed in ***Novochares*** and becomes *Novochares sallaei* (Sharp).



Helochares maculicollis



Novochares sallaei

Helocombus is now considered to be part of ***Cymbiodyta***. Our single species of this now defunct taxon is *Cymbiodyta bifidus* (LeConte). See Toussaint & Short (2019).



Cymbiodyta bifidus



Hydrobius *tumidus* is now ***Limnohydrobius tumidus*** (LeConte). See Short et al. (2017). Of the other two species of *Hydrobius* mentioned on p. 12.42 of my FL water beetle manual, *melaenus* (Germar) is also now placed in *Limnohydrobius*; *H. fuscipes* (L.) remains in *Hydrobius*.

Limnohydrobius tumidus

Hydrophilus *ensifer* Brullé has been reported for Florida (Pintar & Keller 2020). We now have four species of *Hydrophilus* known from Florida; all are keyed in my water beetle manual.

Novochares. See *Helochares* on page 9.

NOTERIDAE

Pronoterus has been synonymized with ***Suphisellus***; see Baca et al. (2017). Thus our single species of this former genus is now *Suphisellus semipunctatus* (LeConte); the other 5 species of *Pronoterus* known from Florida remain the same.



Suphisellus semipunctatus

SCIRTIDAE

The taxonomy and nomenclature of the North American Scirtidae have been revised by Gimmel & Epler (2024). There are numerous changes! And we can expect to see more changes in the genera *Contacyphon* and *Scirtes*.

Most species of *Cyphon* from Florida are now placed in ***Contacyphon***; see Zwick et al. (2013). Note also that species from the "*Cyphon collaris* complex" (none known to date from Florida) are now placed in the genus ***Nyholmia***; see Klausnitzer (2013).



Nyholmia collaris

There are several name changes for the taxa formerly placed in the now defunct genus *Cyphon*.

"*Cyphon" nebulosus* is now *Contacyphon pubescens* (Fabricius)



Contacyphon pubescens



Contacyphon pusillus

"Cyphon" neopadi is now *Contacyphon pusillus* (LeConte)

"Cyphon" sp. 1 Epler is now considered to represent *Contacyphon ochreatus* (Klausnitzer); "*Cyphon"* sp. 2 Epler is *Contacyphon setulipennis* (Klausnitzer).



Contacyphon setulipennis

Unfortunately, larvae that belong to what I'm calling the "*Contacyphon* group" can not even be identified to genus, because there are at least two genera in Florida that were previously included in "*Cyphon*", and none have been reared and associated with adults. However, most scirtid larvae I've seen from Florida are either *Ora* or *Scirtes*, so most likely you'll be able to identify larvae collected from most aquatic habitats sampled. UV light trapping near water bodies produces numerous adult specimens of *Contacyphon* group taxa, but where do the larvae live in those bodies of water?

The taxon **"*Cyphon*" sp. 3** Epler represents a new genus, currently being described by Ruta, Libonatti, Epler & Klausnitzer (in prep.). Our species is the northernmost representative of a genus that currently contains 13 species. Most are found in Central and South America, ten of them undescribed.



New genus



Ora discoidea

Ora discoidea Champion has been found in Florida (Collier Co., Immokalee); it will key to *O. texana* but is marked differently. See Epler & Gimmel (2019) for a key to all *Ora* species in the USA.

Prionocyphon limbatus LeConte has been collected from FL. Three specimens were collected at Tall Timbers Research Station in Leon Co. in 1993 (material from FSCA).



Prionocyphon limbatus



Scirtes goliai

***Scirtes* sp. 1** Epler has been described as *Scirtes goliai* Epler; see Epler (2012).

GENERAL ERRORS

p. 1.16 - There's a typo in the first part of couplet 14 leading to Ptilodactylidae. The last phrase should read "antennal segments 1 and 2 long, 3 very short". Thanks to Doug Strom for informing me of my lack of typing skills!

p. 1.6 - 2nd column, under 3., line 15 should read “the bulging, white abdominal venter, ...”

p. 1.8 - Brady Richards (California State University, Chico, CA) was somehow left off the list of workers who supplied specimens – sorry, Brady!

pp. 3.1, 3.7 – *Auleutes* is misspelled as *“Aleutes”*.

pp. 5.38, 18.2, 18.7 - parentheses removed from author name for *Celina grossula* - should be *Celina grossula* LeConte. I had followed an error in Young (1979) by placing "LeConte" in parentheses. Because LeConte originally described the species *grossula* in the genus *Celina*, there are no parentheses around his name.

p. 5.51- 4th line in 2nd paragraph should read “stridulating ridges anterior to the hind trochanter” (not “coxa”).

p. 5.63 - Couplet 1 has *H. deflatus* at 3.8 – 4.7mm but the description has it listed as 4.2-4.7mm; go with 3.8-4.7 mm.

p. 5.70 - species box: delete space in *“inexpectatus”*

p. 5.92 - the captions for the two beetles are switched; *N. p. pullus* is on the left, *N. p. floridanus* on the right! Thanks to Dana Denson for catching this!

p. 6.23 – what are termed “basolateral” triangles in couplet 14 should be basomesal triangles.

pp. 12.6, 12.30 - On p. 12.6 in the key for larval hydrophilids, the third statement in couplet 12 leading to ***Enochrus*** should read "LEFT mandible with one inner tooth, RIGHT with two inner teeth". The figures are oriented correctly. In the diagnosis for larvae on p. 12.30, the same mistake was repeated. It is the right mandible that bears two inner teeth; the left mandible bears one inner tooth.

p. 16.14 - under Notes – the “fourth form” referred to in line 1 is not “keyed below”; it should read “discussed below”.

LITERATURE

Angus, R.B. 2010. *Boreonectes* gen. n., a new genus for the *Stictotarsus griseostriatus* (De Geer) group of sibling species (Coleoptera: Dytiscidae), with additional karyosystematic data on the group. Comparative Cytogenetics 4: 123-131.

Archangelsky, M. 1997. Studies on the biology, ecology and systematics of the immature stages of New World Hydrophiloidea (Coleoptera: Staphyliniformia). Ohio Biological Survey Bulletin New Series Vol. 12 No. 1. Ix + 207 pp.

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Balke, M, Hájek, J & Hendrich, L. 2017. Generic reclassification of species formerly included in *Rhantus* Dejean (Coleoptera, Dytiscidae, Colymbetinae). Zootaxa 4258: 91-100.

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Kobayashi, T., Hayashi, M., Kamite, Y. & Sota, T. 2021. Molecular phylogeny of Elmidae (Coleoptera: Byrrhoidea) with a focus on Japanese species: implications for intrafamilial classification. Systematic Entomology 46: 870–886.

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Miller, K.B., Michat, M.C. & Ferreira Jr., N. 2024. Reclassification of Cybistrinae Sharp, 1880 in the Neotropical Region (Coleoptera, Adephaga, Dytiscidae), with the description of new taxa. ZooKeys 1188: 125-168.

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Villastrigo, A, Ribera, I., Manuel, M., Millan, A. & Fery, H. 2017. A new classification of the tribe Hygrotini Portevin, 1929 (Coleoptera: Dytiscidae: Hydroporinae). Zootaxa 7317: 499–529.

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Zwick, P., Klausnitzer, B. & Ruta, R. 2013. *Contacyphon* Gozis, 1886 removed from synonymy (Coleoptera: Scirtidae) to accommodate species so far combined with the invalid name, *Cyphon* Paykull, 1799. Entomologische Blätter und Coleoptera 109: 337-353.

Many thanks to Matt Pintar for informing me about some papers I had missed!!