

- 25(24). Eyes rounded, rostrum mostly very elongate, slender and cylindrical in cross section (Figs. 13, 15-19); antenna with scape not or just reaching anterior margin of eye (Figs. 13) IV. Curculioninae (part) (p. 732)
- Eyes more or less elongate-oval, rostrum shorter, more robust and subquadrate in cross section (Figs. 64, 81); antenna with scape just reaching or passing anterior margin of eye (Fig. 64) 26
- 26(25). Pronotum with anterolateral margin with distinct postocular lobe present (Fig. 64) XI. Cyclominae (p. 765)
- Pronotum with anterolateral margin straight, simple or postocular lobe at most very slightly developed (Fig. 81) 27
- 27(26). Vestiture with at least some bifid scales (limited on some specimens to thoracic sterna), if bifid scales appear absent, humeri obviously quadrate; humeri quadrate to subquadrate, rarely rounded, if humeri rounded, bifid scales are distinct on dorsum XIII. Hyperinae (p. 782)
- Vestiture simple, lacking bifid scales; humeri rounded XII. Entiminae (part) (p. 766)

CLASSIFICATION OF THE NEARCTIC CURCULIONIDAE

I. Dryophthorinae Schoenherr 1825

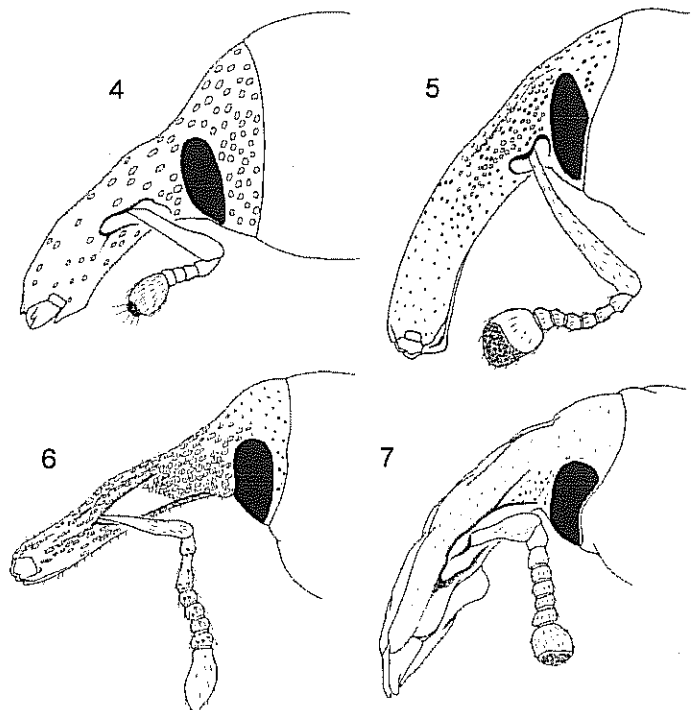
by Robert S. Anderson

This group of weevils is characterized by the form of the antennal club with the basal article glabrous and glossy, the presence of what Zimmerman (1993) called 'dermal lobes' extended between the tarsal claws from both dorsal and ventral surfaces of the apex of tarsal article 5, the antenna (usually) with the scape long and extended far beyond the posterior margin of the eye, and male genitalia with a distinct lateral line dividing the aedeagus into upper (tectum) and lower (pedon) parts. This primitive form of genitalia is shared with Raymondionyminae and Eriirhininae and is the basis for some authors removing these three subfamilies from Curculionidae and giving them each separate family status. By removing these three groups, the hypothesis of monophyly of Curculionidae is strengthened based on their unique derived form of genitalia not shared with other Curculionoidea.

Dryophthorinae are a tropical group, and few species occur in North America. Except for the diverse genus *Sphenophorus*, of the North American genera each is represented by but one or a few species. Most dryophthorines are associated with monocots, including Poaceae, Cyperaceae, Liliaceae and Arecaceae. Some species are serious pests of bananas, bromeliads, corn, turfgrass and stored products. Larvae generally mine stems or roots, some in semiaquatic habitats. The odd genus *Dryophthorus* is associated with moist dead wood.

KEY TO THE NEARCTIC GENERA OF DRYOPHTHORINAE

- 1. Antenna with funicle of 4 articles (Fig. 4); tarsus with 5 distinct articles; body usually covered with a crusty deposit; size small, less than 4.0 mm in body length *Dryophthorus*
- Antenna with funicle of 6 articles (Figs. 5-7); tarsus with 5 articles but with article 4 small and difficult to see at base of article 5; body lacking surface deposit; size various 2
- 2(1). Pygidium covered by apex of elytra; antenna with scape not reaching anterior margin of eye (Figs. 6-7); metepimeron not visible 3
- Pygidium exposed at apex of elytra; antenna with scape projected at least past anterior margin of eye (Fig. 5); metepimeron visible (obscure in *Sitophilus*) 4
- 3(2). Front coxae contiguous; hind tibia expanded apically and with broad wide apical bevel; pronotum with postocular lobes; mandible large, lacking teeth on exterior face *Orthognathus*
- Front coxae separated by prosternum; hind tibia linear, not expanded apically and with narrow apical bevel; pronotum lacking postocular lobes; mandible small, with 3 teeth on exterior face *Yuccaborus*
- 4(2). Size small, total body length less than 5 mm; tibiae (especially front) with distinct subapical tooth on inner margin in addition to larger apical tooth *Sitophilus*
- Size moderate to large, total body length greater than 5 mm; tibia with at most a rounded subapical swelling on inner margin in addition to larger apical tooth 5



FIGURES 4.131-7.131. Dryophthorinae, lateral view of head. 4. *Dryophthorus americanus* Bedel; 5. *Sphenophorus zaeae* Walsh; 6. *Yuccaborus frontalis* (LeConte); 7. *Orthognathus subparallelus* (Chevrolat).

Copyright © 2002. CRC Press. All rights reserved. May not be reproduced in any form without permission from the publisher, except fair uses permitted under U.S. or applicable copyright law.

CLASSIFICATION OF THE NEARCTIC DRYOPHTHORINAE

1. Dryophthorini Schoenherr 1825

Dryophthorus Germar 1824, 1 sp., *D. americanus* Bedel 1885, generally distributed in eastern North America. Adults are found under bark, in association with old rotten logs or in forest litter.

- Bulbifer* Dejean 1821
- Dryophora* Berthold 1827
- Tetratennius* Wollaston 1873
- Tetraspertus* Pascoe 1885

2. Orthognathini Lacordaire 1866

Orthognathina Lacordaire 1866

Orthognathus Schoenherr 1838, 1 sp., *O. subparallelus* (Chevrolat 1880), Arizona. Adults have been collected at lights.

Sphenognathus Schoenherr 1840

Rhinostomina Kuschel 1995

Yuccaborus LeConte 1876, 1 sp., *Y. frontalis* (LeConte 1876), generally distributed in southwestern United States. Two subspecies are recognized. Adults and larvae are associated with *Yucca* (Liliaceae); adults come to lights.

3. Rhynchophorini Schoenherr 1833

Rhynchophorina Schoenherr 1833

Rhynchophorus Herbst 1795, 2 spp., *R. palmarum* (Linnaeus 1758) and *R. cruentatus* (Fabricius 1775). Extreme southeastern United States, Texas and California. Adults and larvae are associated with various species of palms (Arecaceae). See Wattanapongsiri (1966) to separate the species. (Volume 1, Color Fig. 14)

Cordyle Thunberg 1797

Litosomina Lacordaire 1866

Sitophilus Schoenherr 1838, 5 spp., generally distributed; adventive. Three species, *S. granarius* (Linnaeus 1758), *S. zeamais* Motschulsky 1855, and *S. oryzae* (Linnaeus 1763) are serious pests of stored grain products. See Kuschel (1961) for a partial key to species.

Sphenophorina Lacordaire 1866

Cactophagus LeConte 1876, 1 sp., *C. spinolae* (Gyllenhal 1838), Arizona and California, adults and larvae are associated with *Carnegiea gigantea* (Engelm.) and other cacti (Cactaceae) (Anderson 1948). *Cactophagus graphipterus* (Champion 1910) has been found in orchid houses in Connecticut, Washington DC, and New Jersey (Barber 1917). It is not known if this species is established there. See Vaurie (1967) to separate the species.

Copyright © 2002. CRC Press. All rights reserved. May not be reproduced in any form without permission from the publisher, except fair uses permitted under U.S. or applicable copyright law.

- 5(4). Metepisternum very broad, length more or less 2 times width; antenna with club transverse, wider than long, lateral margins at base widely divergent, shape sub-triangular; body size very large, total body length greater than 25 mm *Rhynchophorus*
- Metepisternum narrow, length 3 or more times width; antenna with club elongate, longer than wide, lateral margins at base sub-parallel to slightly divergent, shape sub-quadrate or sub-oval; body size moderate to large, total body length greater than 5 mm but less than 25 mm 6
- 6(5). Scutellum (exposed portion) widest at or near middle, shape rhomboidal or sub-circular; more or less as long as wide *Cosmopolites*
- Scutellum (exposed portion) widest at or near base, shape triangular or sub-triangular; generally longer than wide 7
- 7(6). Tarsus with article 3 with ventral pilosity long, confined to apical margin as a continuous fringe, ventral surface otherwise glabrous; antenna with club obliquely truncate at apex with apical pilose part very short, appearing recessed within glabrous part, visible only as a narrow line in lateral view *Scyphophorus*
- Tarsus with article 3 with ventral pilosity long or short, uniformly covering 1/3 or more of ventral surface, or with pilosity sparse and confined to anterolateral angle or lateral margins, ventral surface otherwise glabrous; antenna with apex evenly rounded or truncate, with apical pilose part long, distinctly visible as more than a narrow line in lateral view 8
- 8(7). Tarsus with article 5 ventrally excavated and bilamellate at middle of apex; rostrum hump-like at base, directed posteroventrally; associated with Asteraceae, Asclepiadaceae *Rhodoabaenus*
- Tarsus with article 5 ventrally evenly rounded at middle of apex; rostrum straight (few) or evenly rounded at base (many), directed anteroventrally; associated with monocotyledons 9
- 9(8). Tarsus with article 3 with ventral pilosity restricted to anterolateral areas, median area largely glabrous, article 3 narrow, subequal in width to article 2 (many) or broad, wider than article 2 (few) *Sphenophorus*
- Tarsus with article 3 with ventral pilosity extensive covering nearly all of ventral surface except near base at middle, article 3 broad, wider than article 2 10
- 10(9). Front coxae widely separated by width of antennal club; middle coxae widely separated by width of a coxa; prementum toothed ventrally or slightly emarginate at apex; Florida; on Arecaceae, Bromeliaceae *Metamasius*
- Front coxae narrowly separated by one-half width of antennal club; middle coxae narrowly separated by one-half width of a coxa; prementum broadly sulcate throughout length; Arizona, California; on Cactaceae *Cactophagus*

Eucactophagus Champion 1910
Phyllerythrus Chevrolat 1885

Cosmopolites Chevrolat 1885, 1 sp., *C. sordidus* (Germar 1824), Florida, adventive. This species is associated with banana trees (*Musa sapientum* L.); larvae mine stem and corm (Woodruff 1969).

Metamasius Horn 1873, 3 spp., *M. hemipterus* (Linnaeus 1758) and *M. callizona* (Chevrolat 1883), adventive; *M. mosieri* Barber 1920, native; Florida. *Metamasius hemipterus* is associated with palms, sugar cane, and bananas (Woodruff and Baranowski 1985), whereas, *M. callizona* is a serious pest in *Tillandsia* (O'Brien and Thomas 1990, Frank and Thomas 2000, Larson and Frank 2000); *M. mosieri* is also associated with bromeliads (Larson *et al.* 2001). See Vaurie (1966) to separate the species.

Odontorhynchus Chevrolat 1880
Odontorhynchus Kirby 1881
Metmasiopsis Champion 1910
Subphyllerythrus Voss 1954

Rhodoabaenus LeConte 1876, 2 spp., *R. tredecimpunctatus* (Illiger 1794) and *R. quinquepunctatus* (Say 1824), generally distributed in United States and southeastern Canada. Species are associated with various Asteraceae and Asclepiadaceae; larvae are in stems (Vaurie 1981). See Vaurie (1981) to separate the species.

Homalostylus Chevrolat 1885

Scyphophorus Schoenherr 1838, 2 spp., *S. acupunctatus* Gyllenhal 1838 and *S. yuccae* Horn 1873, generally distributed in extreme southern United States. Species are associated with *Agave* and *Yucca* (Liliaceae); larvae mine the roots and stems. See Vaurie (1971) to separate the species.

Sphenophorus Schoenherr 1838, 65 spp., generally distributed. Species are associated with various monocots including grasses (Poaceae) and sedges (Cyperaceae) (Vaurie 1951). Some species are pests of turfgrass or corn. See Vaurie (1951) to separate the species. (Volume 2, Color Fig. 30)

Sitonobia Gistel 1856
Merothricus Chevrolat 1885
Trichischius LeConte 1876
Nesorthognathus Voss 1943

Diocalandrina Zimmerman 1993

[*Diocalandra* Faust 1894, 3 spp., intercepted in quarantine; British Columbia, Washington, California and Arizona. Not established in North America.]

II. Eirirhininae Schoenherr 1825

by Robert S. Anderson

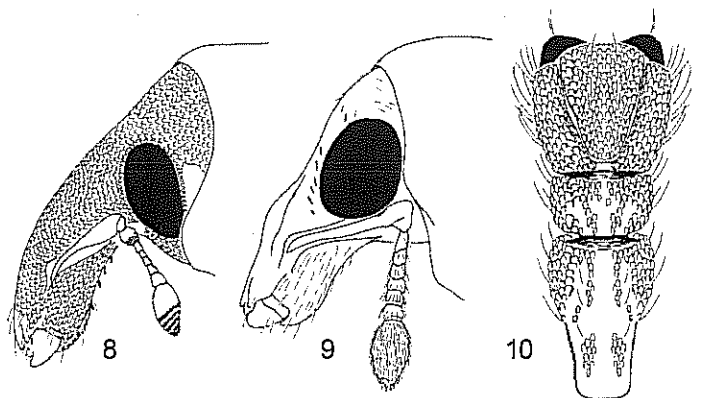
This group of weevils is unfortunately very difficult to characterize based solely on external characters. Like Dryophthorinae and

Raymondionyminae, they possess male genitalia that are primitive in structure with the aedeagus with separate tectum and pedon, and the tegmen as long as or longer than the aedeagus. Most species are associated with aquatic or semi-aquatic habitats and the members of the subtribe Stenopelmina possess a dense, varnish-like coating over the scales or have dense hydrofuge scales. Many species are active swimmers.

Most species mine the stems or other parts of aquatic macrophytes. Species in the genera *Cyrtobagous*, *Neochetina* and *Neohydronomus* have been introduced for biological control of aquatic weeds, mainly in Florida. *Grypus equiseti* (Fabricius 1775) is associated with primitive horsetails of the genus *Equisetum*.

KEY TO THE NEARCTIC GENERA OF EIRIRHININAE

- 1. Antenna with funicle of 6 articles 2
- Antenna with funicle of 7 articles 11
- 2(1). Tarsus with single claw *Brachybamus*
- Tarsus with two claws 3
- 3(2). Antenna with club with basal article glabrous and glossy and almost as long as rest of club (Fig. 8); tarsus with article 3 not emarginate, usually not wider than article 2 4
- Antenna with club uniformly pubescent (Fig. 9); tarsus with article 3 various 6
- 4(3). Pronotum with anterolateral margin straight, postocular lobe absent; tarsus with article 5 longer than four other articles combined; dorsal vestiture of only isolated appressed, rounded scales, no obvious varnish-like coating overlying scales ..
 *Cyrtobagous*
- Pronotum with anterolateral margin with well-developed postocular lobe; tarsus with article 5 shorter than four other articles combined; dorsal vestiture of dense appressed scales, with varnish-like coating overlying scales 5
- 5(4). Rostrum short, stout, nearly straight (Fig. 8); middle tibia flattened, with outer margin evenly curved, and with both inner and outer margins with numerous long, dense, fine hairs *Lissorhoptrus*
- Rostrum slender, elongate, evenly curved; middle tibia not flattened, with outer margin more or less



FIGURES 8.131-10.131. Eirirhininae. 8-9. Lateral view of head. 8. *Lissorhoptrus oryzaophilus* Kuschel; 9. *Stenopelmus rufinasus* Gyllenhal; 10. *Natiodes setosus* (LeConte), tarsus, dorsal view.

Copyright © 2002. CRC Press. All rights reserved. May not be reproduced in any form without permission from the publisher, except fair uses permitted under U.S. or applicable copyright law.

