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 DESCRIPTIONS OF THE LARVAE OF SOME WEST INDIAN
MELOLONTHINE BEETLES AND A KEY TO THE KNOWN
LARVAE OF THE TRIBE ¹

 By ADAM G. BÖVING

THIS paper presents generic descriptions of the mature larvae of the genera *Cnemarachis* Saylor and *Clemora* Saylor; a specific description of the genotype *Cnemarachis vandinei* (Smyth) and taxonomic remarks about the larvae of *Cnemarachis neglecta* (Blanchard), *C. suturalis* (Chevrolat), *C. dissimilis* (Chevrolat), and *C. portoricensis* (Smyth); and a specific description of the larvae of the genotype *Clemora smithi* (Arrow) and taxonomic remarks about *Clemora apicalis* (Blanchard) and an undetermined species of *Clemora* from Cuba. After the descriptions is a synoptic key to the larvae of several exotic species of Melolonthini. The paper has been prepared to follow one by Lawrence W. Saylor² dealing with the taxonomy of the same forms in their adult stage.

Genus CNEMARACHIS Saylor

PLATES 18, 19, FIGURES 7A, 7B, 13, 14, 19, 20

Anterior marginal part of frons with a transverse series of long setae, about seven on each side; at the middle of frons one fine, long seta on each side; and midway between this seta and the condyle

¹The data herein bearing on the systematic position in the Melolonthini of the North American genus *Phyllophaga* are to be incorporated in a comprehensive report on these beetles now being prepared under joint grants from the American Philosophical Society and the National Academy of Sciences.

²Proc. U. S. Nat. Mus., vol. 92, No. 3145.

for the mandible another fine, long seta. Epicranium with three fine, long setae on each side of the epicranial suture, and a tuft of long setae behind the ring-shaped support for the antenna, followed ventrally by several moderately long setae. Clypeus with the anterior transverse part whitish and without setae and the posterior part dark, sclerotized, armed laterally with one anterior and one posterior long seta, and between the anterior lateral seta and the sagittal line with one long seta. Labrum with apex crenulate and somewhat projecting; across the wider part of labrum an irregularly wrinkled, heavy ridge; apical projection with two stiff setae on each side; on the anterior part of ridge with a series of long setae, two on each side and on the posterior part five similar setae on each side; three long setae along each lateral margin of labrum between the ridge and the apical projection. Ocellar spots apparently absent (specimens in alcohol). Antenna slender, with four articles, penultimate article with a well-developed conical process on inner side at apex, the process with a circular sensory spot ("sensillum placodeum") facing the distal article (*PR*, fig. 7B); distal article sub-elliptical, somewhat asymmetrical, about four times as long as wide, terminally slightly constricted, with one large sensory spot on outer side and two smaller ones on the more curved inner side, constricted end with about seven short tactile pegs. Mandible (fig. 20) without any trace of stridulating area on ventral side; scissorial part dark, slender, with a small tooth on cutting edge near apex; exterior part of mandible limited by two apically converging carinae (*DC* and *VC*) enclosing a convex subtriangular region distally armed with one strong seta and along the entire length with seven or eight punctures; ventral carina (*VC*) with six long setae; molar part of right mandible with a subtrapezoidal heel (calx) about one-half as wide as long, posteriorly slightly emarginate in the middle. Maxillary lobes (lacinia and galea) fused proximally but free distally; ventral surface almost exclusively formed by galea, which ends with a single strong unci; dorsal surface formed by both lacinia and galea, which are demarcated by a longitudinal well-sclerotized sulcus; lacinia ending with three strong, basally united unci. Stipes (fig. 19) with a longitudinal row of about 15 pointed, conical stridulating teeth, each tooth (*D*) about as long as wide at base. Cardo with long setae but without unusual structures. Maxillary articulating membrane (*AM*) with many long and short setae but without dark granules or other irregular elements. Maxillary palpus projecting beyond galea, with four articles, the distal article similar in form and vestiture to the distal antennal article but with only a single sensillum placodeum, present on the outer side.

Epipharynx (fig. 13)³ with distinct epizygon (*EZ*) extending to and fused with zygum (*Z*). Plegmatium (*PL*) on each side well developed, rather broadly elliptical, consisting of 15 or more somewhat sinuous plegmata; proplegmatium (*PPL*) well developed, broadly lanceolate, consisting of about 35 fine plaits or proplegmata; chaetopariae (*C*) with moderately long setae toward pedium (*P*) and slenderer and shorter ones toward plegmatium, no sensilla interspersed between the setae, two more or less parallel rows of setae between proplegmatium and the epipharyngeal margin; zygum thinly sclerotized, six large and several small sensilla in a single, curved, transverse row along and behind the entire zygum; heli (*H*) in two transverse rows with five heli in the anterior and two in the posterior row; phobae (*PH*) present; some sensilla in front of crepis (*CR*). Prothoracic and mesothoracic legs with claw (ungulus) about one-third the length of tibiotarsus; somewhat swollen metathoracic leg with claw about one-sixth the length of tibiotarsus, with enlarged base of claw carrying one stout and one finer seta and with small, conical, terminal part of claw about as long as basal part and about one-fourth the length of the stout seta.

Raster (fig. 14)³ without septula or pali; tegilla (*TL*) composed of well-developed, flat, curved, and terminally hooked setae, either all the same length and strength or with a considerable number of stronger setae in the sagittal middle region; tegillum (*TL*) on right and left side meeting, thus forming a continuous patch (teges) occupying almost the whole of the tenth abdominal venter (*TG*).

Spiracles each with a C-shaped respiratory plate almost completely surrounding the bulla.

LARVA OF THE GENOTYPE CNEMARACHIS VANDINEI (SMYTH)

The material on which the following specific description is based is in the U. S. National Museum and consists of:

(1) *Cnemarachis vandinei* (Smyth), a full-grown larva and a set of larval and pupal skins, associated with the reared adult. Larvae collected by H. K. Plank, Puerto Rico, October 8, 1935; marked "P. R. #1616."

(2) *Cnemarachis vandinei* (Smyth), full-grown larva, associated with a reared adult determined by Dr. E. A. Chapin; the cast larval and pupal skins were not kept; collected and reared by H. K. Plank at Mayagüez, P. R., October 1935; marked "P. R. #1617."

Length of mature larva about 50 mm. Cranium (clypeus and labrum excluded) broader than long, extreme width 6 mm., length

³ For explanation of terms relative to epipharynx and raster, see Böving, A. G., Proc. Ent. Soc. Washington, vol. 38, pp. 175-181, illus., 1936.

4.5 mm., surface shallowly and finely reticulate, shining, yellowish brown (in alcohol), with numerous minute sensilla. Clypeofrontal suture well marked; frontal sutures ("arms of epicranial suture" auct.), very fine, almost obliterated, anterior half convex toward the outside, posterior half straight to concave; epicranial suture ("stem of epicranial suture" auct.), about one-third the length of one of the frontal sutures, anteriorly with a small, slightly impressed, brownish enlargement. Dorsoexterior region (*DE*, fig. 20) of mandible without punctures or small hairs; dorsomolar region (*DM*) with an oblique series of about seven setae on the right mandible and about half as many on the left mandible; a patch of several basolateral setae present. Epipharynx (*CR*, fig. 13) with two large and about seven small sensilla in the space in front of crepis; about six sensilla behind inner end of dextortorma (*DX*). Raster (fig. 14) with all the tegillar setae of approximately the same length and strength.

LARVAE OF *CNEMARACHIS NEGLECTA* (BLANCHARD), *C. SUTURALIS* (CHEVROLAT), *C. DISSIMILIS* (CHEVROLAT), AND *C. PORTORICENSIS* (SMYTH) (?)

In addition to the larvae of *Cnemarachis vandinei* (Smyth), the U. S. National Museum possesses a single or a few larvae of the following West Indian species of *Cnemarachis*:

1. *C. neglecta* (Blanchard), from Santa Rita, Puerto Rico, collected January 19, 1911, by D. L. Van Dine.

2. *C. suturalis* (Chevrolat), attacking roots of sugarcane, Baragua, Cuba; collected April 3, 1931, by H. K. Plank, reared; adult determined by Dr. E. A. Chapin.

3. *C. dissimilis* (Chevrolat), in soil, Baragua, Cuba, collected by Stahl, cast skin of mature larvae associated with the reared adult; adult determined by Dr. E. A. Chapin.

4. *C. portoricensis* (Smyth) (?): (a) in soil near banana roots, Arecibo, Puerto Rico, November 26, 1935, Faxon coll., marked "San Juan 5945"; (b) in soil around Caguas, Puerto Rico; (c) in banana roots, Mayagüez, Puerto Rico, June 27, 1935, marked "San Juan 6061."

The larva of *C. neglecta* (Blanchard) is so similar to that of *C. vandinei* (Smyth) that I have been unable to separate them. The same is also the case with the larval forms tentatively determined in the Museum collection as *C. portoricensis* (Smyth). It should be noted particularly that the appearance of the raster is identical in the larvae of these species.

The larvae of *C. suturalis* (Chevrolat) and *C. dissimilis* (Chevrolat) are inseparable but both differ from *C. vandinei*, *C. neglecta*, and *C. portoricensis* (?) in having a group of about eight very strong,

flat, terminally hooked setae arranged irregularly in the sagittal region of raster and contrasting in their size and somewhat darker color with the weaker and shorter setae in teges. In all other characters the five West Indian species of *Cnemarachis* are alike.

Genus CLEMORA Saylor

PLATE 19, FIGURES 15, 16

Anterior marginal part of frons with a transverse series of about 10 long and moderately long setae. Frons with two long setae approximate to each frontal suture ("arms of epicranial suture" auct.), one seta midway between extremities of the suture, the other between this seta and the condyle for the mandible. Epicranium, clypeus, and labrum with the same number and arrangement of setae as in *Cnemarachis*. Ocelli, antennae, mandibles, and maxillae as in *Cnemarachis*.

Epipharynx (fig. 15) with epizygon (*EZ*) extending to zygon (*Z*); plegmatium (*PL*) well developed on each side, broadly lanceolate with about 15 somewhat sinuous plegmata; proplegmata absent; a crescent-shaped, thin sclerome (*SCL*) present, indicating the anterior limit of the space that in *Cnemarachis* and many other scarabaeid larvae is plaited but here is without plaits and beset with setae from chaetoparia (*C*); zygon (*Z*) thinly sclerotized, the space behind zygon with a curved row of six large and several small sensilla, and behind these are two transverse rows of heli (*H*); five heli in the anterior and two heli in the posterior row; phobae (*PH*) present; many sensilla in front of crepis (*CR*). Claws (unguli) as in *Cnemarachis*.

Raster (fig. 16) without septula and without pali. Tegilla (*TL*) on left and right side united into a continuous patch (teges) of flat, curved, terminally hooked setae (*TG*); the setae of a medium irregular group, numbering about 9 to about 15, are much stronger than the rest (as in the species *Cnemarachis suturalis* and *Cnemarachis dissimilis*).

Spiracles as in *Cnemarachis*.

LARVA OF THE GENOTYPE CLEMORA SMITHI (ARROW)

The material on which the following specific description is based is in the U. S. National Museum and consists of:

1. *Clemora smithi* (Arrow) cast larval skins and reared adult, received through the assistance of W. H. Edwards, Jamaica, from R. W. Tucker, Barbados, February 10, 1938.

2. *Clemora smithi* (Arrow) several larvae taken at base of roots of sugarcane, Duncans, Jamaica, collected by W. H. Edwards, December 21, 1937.

Length of mature larva about 50 mm. Extreme width of cranium 6 mm., length (clypeus and labrum excluded) 4.5 mm.; cranium very finely reticulate, shining yellowish brown (in alcohol) with numerous minute sensilla. Epipharynx (fig. 15) with sensilla interspersed between the setae of both chaetopariae (*C*), but more numerous on right side; space in front of crepis (*CR*) with two larger and more than 35 smaller sensilla; about five sensilla behind inner end of dextortorma. About 15 setae in the median group of strong setae in raster (fig. 16).

LARVAE OF *CLEMORA APICALIS* (BLANCHARD) (?) AND AN
UNDETERMINED SPECIES OF *CLEMORA* FROM CUBA

In addition to the larvae of *Clemora smithi* (Arrow), the U. S. National Museum possesses a few specimens of a species of *Clemora* from roots of banana in Haiti. The species is probably *Clemora apicalis* (Blanchard). The larvae were collected by Arnault Haspil but are not associated with reared adults. These larvae have only about 15 sensilla in front of crepis, while *Clemora smithi* has more than 35, but otherwise they cannot be separated from the latter species by any character.

An undetermined larva in the U. S. National Museum from Santiago de Cuba was collected on February 20, 1908, by E. A. Brooks near a rosebush. It agrees completely with the larva of *Clemora apicalis* (Blanchard) (?) from Haiti, except that there are only 9 strong setae medianly in raster, and not about 15 as there are in both *C. apicalis* (?) and *C. smithi*.

LARVAE OF SOME EXOTIC MELOLONTHINAE

The following synoptic key has been prepared mainly in order to characterize and separate the larvae of the genera of Melolonthini present in the collection of beetle larvae in the U. S. National Museum, but I have also included in the key some species from Korea, notably of the genera *Ancylonycha* and *Apogonia*, described and carefully figured by J. Murayama,⁴ and several species from India and three species from Italy, described and figured, respectively, by J. C. M. Gardner,⁵ Forest Research Institute, Dehra Dun, and Guido Grandi,⁶ University of Bologna, in their usual masterly way. These species, which I never have had an opportunity to examine, have been added for different reasons: *Apogonia cupreoviridis* Kolbe, *Apogonia villosella* Blanchard, *Apogonia cribricollis* Burmeister, *Brahmina coriacea* Hope, and *Granida albosparsa* Moser, because they represent genera of Melolonthini not found in the U. S. National

⁴ Forest Exp. Stat. Chosen Bull. 11, 1931.

⁵ Indian Forest Rec., new ser., Entomology, vol. 1, No. 1, 1935.

⁶ Portici Scuola Sup. Agr. Lab. Zool. Gen. Agr. Bol., vol. 18, 1925.

Museum; *Ancylonycha titanis* Reitter, *Ancylonycha morosa* Waterhouse, and *Ancylonycha diomphalia* Bates, primarily because only one of these species, viz, *titanis*, agrees generically with *Ancylonycha mindanaona* Brenske from Guam, of which the Museum has many specimens. The larvae of *morosa* and *diomphalia*, while congeneric inter se, are so different from *titanis* and *mindanaona* that the genus *Ancylonycha* apparently must be split into two subgenera or possibly genera.⁷

SYNOPTIC KEY ⁸

1. Mandibular stridulatory zone distinct, located near middle of ventro-exterior mandibular surface, oblique, composed of numerous densely set, minute, granular tubercles in no order and forming no pattern (fig. 2); galea with a strong seta-bearing dorsobasal tooth (PRC, fig. 5). [About 7 setae on each side along anterior margin of frons; proplegmata absent; epizygom and zygum absent; number of sensilla in front of crepis about 12 (fig. 1); basal article of labial palpus about as long as distal; septula (SEP, fig. 3) longitudinal with parallel sides; pali (PA, fig. 3) short, slightly hooked, in a row of 20 to 28 on each side, extending about half the length of tegilla in front of this patch of setae; preseptular setae absent.]

Melolontha melolontha Linnaeus ⁹

Mandibular stridulatory zone absent or not distinct; galea without dorsobasal tooth----- 2

- 2 (1). Pali either present and arranged in two oblique, posteriorly strongly diverging series, or in a pair of mustachelike patches, or absent---- 3
 Pali present, usually arranged in a single longitudinal row, or sometimes in two or more longitudinal rows, on each side----- 9

- 3 (2). Pali present----- 4
 Pali absent ----- 5

- 4 (3). Maxillary stridulatory teeth short, present in the number of about 6 distinct and a few indistinct; proplegmata absent; heli 3 or 4, exceptionally 5. [Stipes with a large membranous prolongation between lacinia and galea on the dorsal side, a character discovered by Murayama; anal slit angulate, sagittally with a long cleft; either, in genus *Apogonia*, with pali arranged in two oblique posteriorly strongly diverging series and anterior to these with scattered tegillar setae or, in genus *Diptotaxis*, with pali arranged in a pair of mustachelike patches, and anterior to these with few or no tegillar setae.]

Apogonia cupreoviridis Kolbe (Korea)

A. cribricollis Burmeister (Dehra Dun, India)

A. villosella Blanchard (Dehra Dun, India)

Diptotaxis sordida Say (New Jersey)

D. brevicollis LeConte (Colorado)

⁷ For related remarks see Murayama, *loc. cit.*, pp. 82, 86.

⁸ Besides the strictly alternative characters in the key, others guiding and descriptive, but not necessarily alternative, are given in brackets.

⁹ The following other species of the genus *Melolontha* have been described: *M. virescens* Brenske and *furcicaudata* Ancy, both from India, by J. C. M. Gardner, and *incana* Motschulsky, from Korea, by Joso Murayama. *M. virescens* is mentioned as having 20-23 pali on each side, *furcicaudata* about 27, and *incana* about 20. Pali not always extending in front of tegilla, but the other characters given by both authors in describing their species

Maxillary stridulatory teeth moderately long, numbering 9-13; proplegmata about 10; heli about 7. [Pali in two medianly meeting, posteriorly strongly diverging series, and anterior to these with about 12 tegillar setae on each side and nearer the anterior margin of the segment with very long, thin, straight setae.]

Haplidia etrusca Kraatz (Italy)

5 (3). Anterior margin of frons with two or less setae on each side.

Ancylonycha morosa Waterhouse (Korea)

A. diomphalia Bates (Korea)

Anterior margin of frons with four or more setae on each side..... 6

6 (5). Proplegmata numerous (about 30). [Epizygom either distinct and connected with zygom, or indistinct; number of heli about 7; tegillar setae flat, curved, and terminally hooked]..... 7

Proplegmata absent..... 8

7 (6). Teges (i. e., the medianly united tegilla) with all setae alike. [Chaetopariae without sensilla in *vandinei*, sensilla in front of crepis numbering about 10 in *vandinei*, or more in other species.] (Figs. 13, 14, 19, 20)..... *Cnemarachis vandinei* (Smyth) (Puerto Rico, West Indies)

C. neglecta (Blanchard) (Puerto Rico)

C. portoricensis (Smyth) (?) (Puerto Rico)

(possibly) *Microtrichia cotesi* Brenske (Dehra Dun, India)

Teges with a median longitudinal group of about a dozen setae much stronger than the rest... *Cnemarachis suturalis* (Chevrolat) (Cuba)

C. dissimilis (Chevrolat) (Cuba)

C. citri (Smyth) (?) (Puerto Rico)

8 (6). Zygom fairly distinct; a thin, somewhat crescent-shaped sclerotization present in front of chaetoparia on each side of zygom; number of heli about 7; plegmatium broadly elliptical; many sensilla in front of crepis (about 35 in *C. smithi*, about 15 in *C. apicalis*); teges with a median group of 9 to 15 setae stronger than the rest. [Right chaetoparia with many sensilla, left with comparatively few; distal article of antenna elongate, spindle shaped; anterior margin of frons with long and moderately long setae; disk of frons with two long setae on each side.] (Figs. 15, 16.)

Clemora smithi (Arrow) (Jamaica, Barbados)

C. apicalis (Blanchard) (?) (Haiti)

Zygom vestigial or absent; no sclerotization in front of chaetopariae; number of heli about 15; plegmatium narrow; two sensilla in front of crepis; setae of teges alike in shape and strength. [Chaetopariae without sensilla; distal article on antenna short and thick; anterior margin of frons with numerous moderately long or short setae; disk of frons with numerous moderately long setae.] (Figs. 4, 6, 7.)

Anoxia pilosa Fabricius (Hungary)

A. matutinalis Laporte var. *suturalis* Reitter (Italy)

9 (2). Pali arranged in an irregular, rather short row on each side, and a few not paired pali often present in the longitudinal middle line of septula; number of heli about 15. [Zygom very weak; epizygom vestigial, not connected with zygom; plegmatium narrow; sensilla

are identical with those given for *melolontha*. Neither of them mentions any characters pertaining to the epipharynx. It is possible therefore that the character combination as given here for *melolontha* might not apply in toto to all species of the genus *Melolontha*.

- absent in both chaetopariae; right phobae extending almost to zygum; sensilla in front of crepis about 15]----- 10
- Different arrangement of pali; number of heli less than 15----- 11
- 10 (9). Proplegmata very numerous and fine, forming a pair of large, ovate proplegmata; proplegmata separated anteriorly by median, sub-triangular, posteriorly pointing acroparia (figs. 8, 9).
Polyphylla occidentalis (Linnaeus) (Virginia)
 Proplegmata absent---*Polyphylla crinita* LeConte (Oregon, California)
P. variolosa Hentz (Maine, New Jersey)
P. decemlineata Say (Colorado)
 (perhaps) *Granida albosparsa* Moser (Punjab, India)¹⁰
- 11 (9). Anterior margin of frons with about 3 long setae on each side; with anal slit. [Epizygum distinct, connected with zygum; number of heli about 6; chaetopariae without sensilla; 10 or less sensilla in front of crepis; pali 12 to 20 on each side, arranged in a single, anteriorly longitudinal, posteriorly oblique series.]----- 12
- Anterior margin of frons with usually more than three long setae on each side, or with a transverse patch of numerous setae; indistinct or no anal slit. [Chaetopariae with or without sensilla; region in front of crepis with or without sensilla, maxillary articulating skin with or without dark granules; pali straight or hooked; preseptular setae present or absent.]----- 14
- 12 (11). Proplegmata absent; without preseptular setae (according to Grandi).
Rhizotrogus assimilis Herbst var. *obscurus* Brenske (Italy)
 Proplegmata numbering 10 to 15 to each side----- 13
- 13 (12). Without preseptular setae. [Anterior 8 pali short and hooked.]
Rhizotrogus majalis (Razoumowsky) (France; introduced to Newark, N. Y.)
 With 10 or more preseptular setae (figs. 10-12).
Rhizotrogus solstitialis (Linnaeus) (Europe)
- 14 (11). Numerous round black spots on dorsal side of cardo, on coxae, posterior to the spiracles, and on other places.¹¹ [Proplegmata absent; sensilla absent in chaetopariae; sensilla in front of crepis numbering 20 or more; number of heli about 9; mandibular dorsoexterior region without punctures and setae; pali short, straight, dagger shaped, about 20 on each side; number of preseptular setae about 5.] (Figs. 17, 18)-----*Ancylonycha mindanaona* (Brenske) (Guam, Asia)
 Without black spots-----*Ancylonycha titanis* (Reitter) (Korea)
Brahmina coriacea Hope (India)¹²
Phyllophaga spp. (continental America)

¹⁰ According to Gardner's description.

¹¹ Similar black spots, not to be confused with "black granules," are present in the larvae of the species of *Serica* as first drawn, but not described, by Jozo Murayama (*loc. cit.*, pl. 9, fig. 53, b) and also in the larvae of *Oryctonia jucundo* Falderman (*ibid.*, pl. 10, fig. 69, b).

¹² According to Gardner's description.

ABBREVIATIONS USED ON PLATES

(All figures drawn by the author)

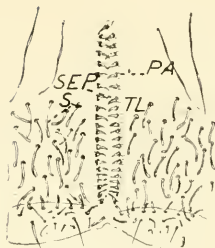
<p><i>ACL</i>----- Anterior part of clypeus.</p> <p><i>ACR</i>----- Acroparia.</p> <p><i>AM</i>----- Articulating membrane of maxilla.</p> <p><i>AMF</i>----- Anterior margin of frons.</p> <p><i>C</i>----- Chaetoparia.</p> <p><i>CA</i>----- Cardo.</p> <p><i>CR</i>----- Crepis.</p> <p><i>CX</i>----- Calx.</p> <p><i>D</i>----- Stridulating tooth on dorsal side of stipes.</p> <p><i>DC</i>----- Dorsolateral carina of mandible.</p> <p><i>DE</i>----- Dorsoexterior region of mandible.</p> <p><i>DM</i>----- Dorsomolar region of mandible.</p> <p><i>DX</i>----- Dextiotorna.</p> <p><i>EZ</i>----- Epizygum.</p> <p><i>H</i>----- Helus.</p> <p><i>P</i>----- Pedium.</p> <p><i>PA</i>----- Palus.</p> <p><i>PAS</i>----- Single palus placed in septula.</p> <p><i>PCL</i>----- Posterior part of clypeus.</p> <p><i>PH</i>----- Phoba.</p>	<p><i>PHL</i>----- Phobae on left side of epipharynx.</p> <p><i>PIIR</i>----- Phobae on right side of epipharynx.</p> <p><i>PL</i>----- Plegmatium.</p> <p><i>PPL</i>----- Proplegmatium.</p> <p><i>PR</i>----- Process on top of third antennal article.</p> <p><i>PRC</i>----- Process with seta on dorsal side of galea.</p> <p><i>PSE</i>----- Preseptular setae.</p> <p><i>RL</i>----- Transverse ridge of labrum.</p> <p><i>S</i>----- Seta.</p> <p><i>SCL</i>----- Sclerome.</p> <p><i>SEP</i>----- Septula.</p> <p><i>ST</i>----- Stipes.</p> <p><i>SZ</i>----- Stridulating zone.</p> <p><i>TG</i>----- Teges.</p> <p><i>TL</i>----- Tegillum.</p> <p><i>VC</i>----- Ventrolateral carina of mandible.</p> <p><i>Z</i>----- Zygum.</p> <p>3----- Third or penultimate article of antenna.</p> <p>4----- Fourth or distal article of antenna.</p>
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1. MELOLONTHA



2.



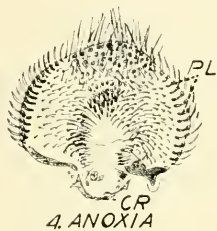
3. MELOLONTHA



3A



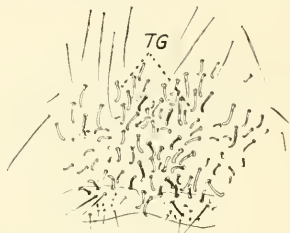
3B



4. ANOXIA



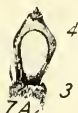
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6. ANOXIA



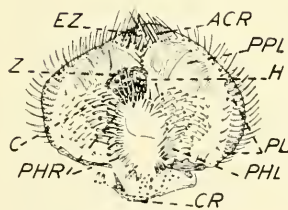
7. ANOXIA



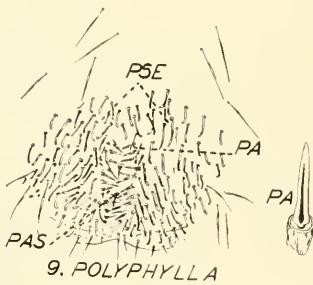
7A



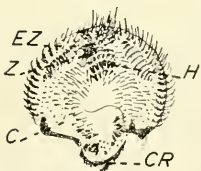
7B



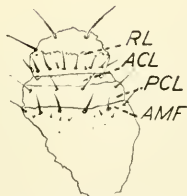
8. POLYPHYLLA



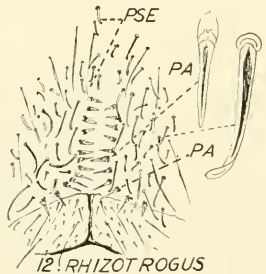
9. POLYPHYLLA



10. RHIZOTROGUS



11. RHIZOTROGUS



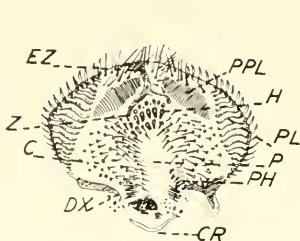
12. RHIZOTROGUS

1-3, 5, *Melolontha melolontha* (Linnaeus): 1, Epipharynx; 2, part of right mandible (ventral); 3, raster; 3A, two pali; 3B, tegillar seta; 5, maxillary stipes with lacinia and galea (dorsal).

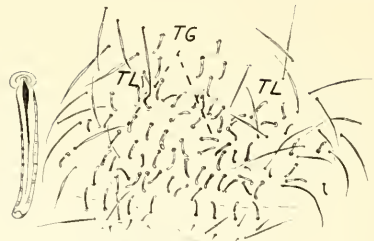
4, 6, 7, *Anoxia pilosa* (Fabricius): 4, Epipharynx; 6, raster; 7, anterior margin of frons; 7A, subapical (3) and apical (4) articles of antenna (dorsal); 7B, subapical (3) and apical (4) articles of antenna (ventral).

8, 9, *Polyphylla occidentalis* (Linnaeus): 8, Epipharynx; 9, raster.

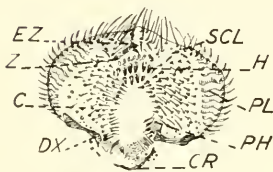
10-12, *Rhizotrogus solstitialis* (Linnaeus): 10, Epipharynx; 11, part of labrum, clypeus, and frons; 12, raster, one enlarged palus, and one enlarged tegillar seta.



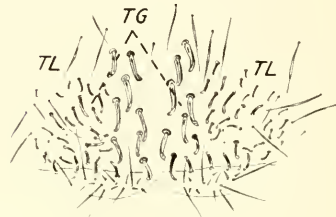
13. *CNEMARACHIS*



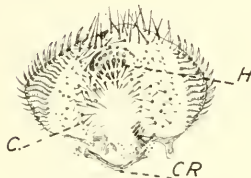
14. *CNEMARACHIS*



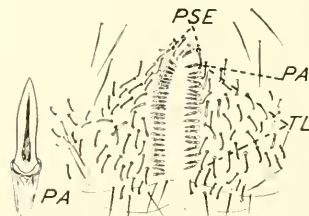
15. *CLEMORA*



16. *CLEMORA*



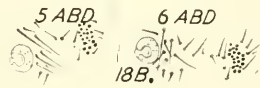
17. *ANCYLONYCHA*



18. *ANCYLONYCHA*



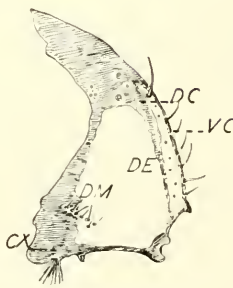
18A.



18B.



19. *CNEMARACHIS*



20. *CNEMARACHIS*



18C.

13, 14, *Cnemarachis vandinei* (Smyth): 13, Epipharynx; 14, raster and one enlarged teillgar seta.

15, 16, *Clemora smithi* (Arrow): 15, Epipharynx; 16, raster.

17, 18, *Ancylonycha mindanaona* (Brenske): 17, Epipharynx; 18, raster and one enlarged palus; 18A, base of coxa with black dots; 18B, black dots posterior to spiracles of fifth and sixth abdominal segments; 18C, base of right maxilla, showing maxillary articulating membrane, cardo with black dots, and part of stipes (dorsal).

19, 20, *Cnemarachis vandinei* (Smyth): 19, Base of right maxillary articulating membrane, cardo, and part of stipes (dorsal); 20, right mandible (dorsal).