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Key to higher taxa of South American weevils based on adult characters (Coleoptera, Curculionoidea)

Clave de taxones superiores de gorgojos sudamericanos basada en caracteres de los adultos (Coleoptera, Curculionoidea)

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ABSTRACT

The weevils (Coleoptera: Curculionoidea) from South America are currently classified in the following families and subfamilies: Nemonychidae (Rhinorhynchinae), Anthribidae (Anthribinae), Belidae (Belinae and Oxycoryninae), Attelabidae (Attelabinae and Rhynchitinae), Brentidae (Apioninae and Brentinae), Caridae (Carinae) and Curculionidae (Erirhininae, Dryophthorinae, Entiminae, Aterpinae, Gonipterinae, Rhythirrininae, Thecesterninae, Eugnominae, Hyperinae, Curculioninae, Cryptorhynchinae, Mesoptiliinae (= Magdalidinae), Molytinae, Baridinae, Lixinae, Conoderinae (= Zygopinae), Cossoninae, Scolytinae and Platypodinae). In the present contribution we bring a dichotomous key for the identification of seven families and 28 subfamilies of Curculionoidea from South America, and for 21 tribes of the highly heterogeneous subfamilies Curculioninae and Molytinae. These tribes are Curculionini Anthonomini, Ceutorhynchini, Derelomini, Otidocephalini, Erodiscini, Camarotini, Piazorhinini, Prionobrachiini, Smicronychini, Rhamphini and Tychiini, within Curculioninae; and Hylobiini, Pissodini, Conotrachelini, Cleogonini, Sternechini, Pacholenini, Cholini, Petalochilini and Amalactini, within Molytinae. Most of them have been classified as subfamilies in traditional schemes. The key is mainly based on external morphological characters, but also includes data on genitalia, mouth parts and other biological features. Definitions and illustrations of diagnostic characters used in the key are provided.

Key words: Curculionoidea, South America, dichotomous key.

RESUMEN

Los gorgojos (Coleoptera: Curculionoidea) de América del Sur se clasifican actualmente en las siguientes familias y subfamilias: Nemonychidae (Rhinorhynchinae), Anthribidae (Anthribinae), Belidae (Belinae y Oxycoryninae), Attelabidae (Attelabinae y Rhynchitinae), Brentidae (Apioninae y Brentinae), Caridae (Carinae) y Curculionidae (Erirhininae, Dryophthorinae, Entiminae, Aterpinae, Gonipterinae, Rhythirrininae, Thecesterninae, Eugnominae, Hyperinae, Curculioninae, Cryptorhynchinae, Mesoptiliinae (= Magdalidinae), Molytinae, Baridinae, Lixinae, Conoderinae (= Zygopinae), Cossoninae, Scolytinae y Platypodinae). En la presente contribución se brinda una clave dicotómica para la identificación de las siete familias y 28 subfamilias de Curculionoidea sudamericanos, y para varias (21) tribus de Curculioninae y Molytinae. Estas tribus son Curculionini, Anthonomini, Ceutorhynchini, Derelomini, Otidocephalini, Erodiscini, Camarotini, Piazorhinini, Prionobrachiini, Smicronychini, Rhamphini y Tychiini, dentro de Curculioninae, e Hylobiini, Pissodini, Conotrachelini, Cleogonini, Sternechini, Pacholenini, Cholini, Petalochilini y Amalactini, dentro de Molytinae. La mayoría de estas tribus han sido clasificadas como subfamilias en los esquemas tradicionales. La clave se basa principalmente en caracteres morfológicos externos, e incluye además datos de la genitalia, piezas bucales, y rasgos biológicos de las especies. El trabajo provee definiciones e ilustraciones de los caracteres diagnósticos utilizados en la clave.

Palabras clave: Curculionoidea, Sudamérica, clave dicotómica.

INTRODUCTION

The weevils are beetles of the superfamily Curculionoidea, mostly phythophagous as both, adult and larval stages. They comprise about 60,000 described species gathered in 6,000 genera. Approximately 10,000 species occur in South America, assigned to about 1,000 genera (Wibmer & O'Brien 1986, Alonso-Zarazaga & Lyal 1999).

The current classification of weevils is under continuous revision, due to new characters provided by adult and larval morphology, the addition of molecular data, and the analysis of this information applying a phylogenetic approach, such as those of Thompson (1992), Zimmerman (1993, 1994a, 1994b), Kuschel (1995), Lawrence & Newton (1995), Marvaldi & Morrone (2000) and Marvaldi et al. (2002). The majority of recent classificatory schemes agree in the circumscription of the main higher groups of Curculionoidea, but they differ in the assignment of ranks and/or the evaluation of the monophyletic status of some heterogeneous subfamilies and tribes.

Keys available for the identification of higher taxa of Curculionoidea are either no updated according to the new classificatory schemes (Costa-Lima 1956), and/or were designed for taxa occurring in geographical latitudes out of South America (Morimoto 1962a, Kissinger 1964, Anderson 2002). A key to identify Argentinian weevils published by Morrone & Posadas (1998) is mostly suitable for taxa at family rank, and the key for South American weevil families and subfamilies published by Marvaldi (2003) is for the larval stage exclusively, and thus complementary of the present key for adults.

The purpose of this paper is to provide a key to identify the families and subfamilies of South American Curculionoidea, and several tribes of the highly heterogeneous subfamilies Curculioninae and Molytinae (Curculionidae), using adult morphological characters.

The identification of genera and species of South American Curculionoidea can be accomplished by using the keys and taxonomic revisions cited in O'Brien & Wibmer (1981, 1984), Wibmer & O'Brien (1986, 1989), Wood (1986), Morrone & Posadas (1998), Alonso-Zarazaga & Lyal (1999), Morrone (1999), Anderson (2002), Lanteri et al. (2002), among the most comprehensive contributions.

MATERIAL AND METHODS

The dichotomous key has been accomplished for seven families (Nemonychidae, Anthribidae, Belidae, Attelabidae, Caridae, Brentidae, and Curculionidae), 28 subfamilies (19 of Curculionidae, one of Nemonychidae, one of Anthribidae, two of Belidae, two of Attelabidae, one of Caridae, and two of Brentidae), and 21 tribes (12 of Curculioninae and nine of Molytinae).

In the "World catalogue of genera of Curculionoidea" published by Alonso-Zarazaga & Lyal (1999) the authors recognized 22 families, following the classification of Thompson (1992) and Zimmerman (1993, 1994a, 1994b). In this contribution we have recognized seven families, according to the phylogenetic proposals of Kuschel (1995), Marvaldi & Morrone (2000) and Marvaldi et al. (2002). As a consequence, some taxa herein treated as subfamilies (i.e., Oxycoryninae, Rhynchitinae, Apioninae, Dryophthorinae, Erirhininae, and Platypodinae) were considered with a family rank by Alonso-Zarazaga and Lyal. Other differences between the classification of the mentioned catalogue and the one herein adopted are as follows: the concept of Entiminae excludes Thecesterninae (Marvaldi 1997), the concept of "Curculioninae" excludes Eugnominae (Marvaldi, unpublished data), and Aterpinae, Rhythirrininae and Gonipterinae are treated as independent subfamilies instead of tribes of Cyclominae.

All the taxa were keyed out a single time except Curculioninae, which was keyed out in four couplets. To check the key, we have used material deposited at the entomological collections of the Museo de La Plata (MLP) and the Instituto Argentino de Investigaciones de las Zonas Áridas (IADIZA-CRICYT).

The main bibliographic references to elaborate the key are Costa-Lima (1956), Morimoto (1962a, 1962b), Kissinger (1964), Clark et al. (1977), Thompson (1992), Zimmerman (1993, 1994a, 1994b), Kuschel (1995), Kuschel et al. (2000), Anderson (2002), and Marvaldi et al. (2002).

Most characters used in the key are external morphological features easily visible under a stereo-microscope. In some instances, the observation of the genitalia is needed (previous dissection) to ensure correct identifications (e.g., Erirhininae). The terminology to designate different structures and body parts mentioned in the key is indicated mainly in Fig. 1, and the diagnostic characters are diagrammatically illustrated (Fig. 2 to 10), except details of the vestiture.

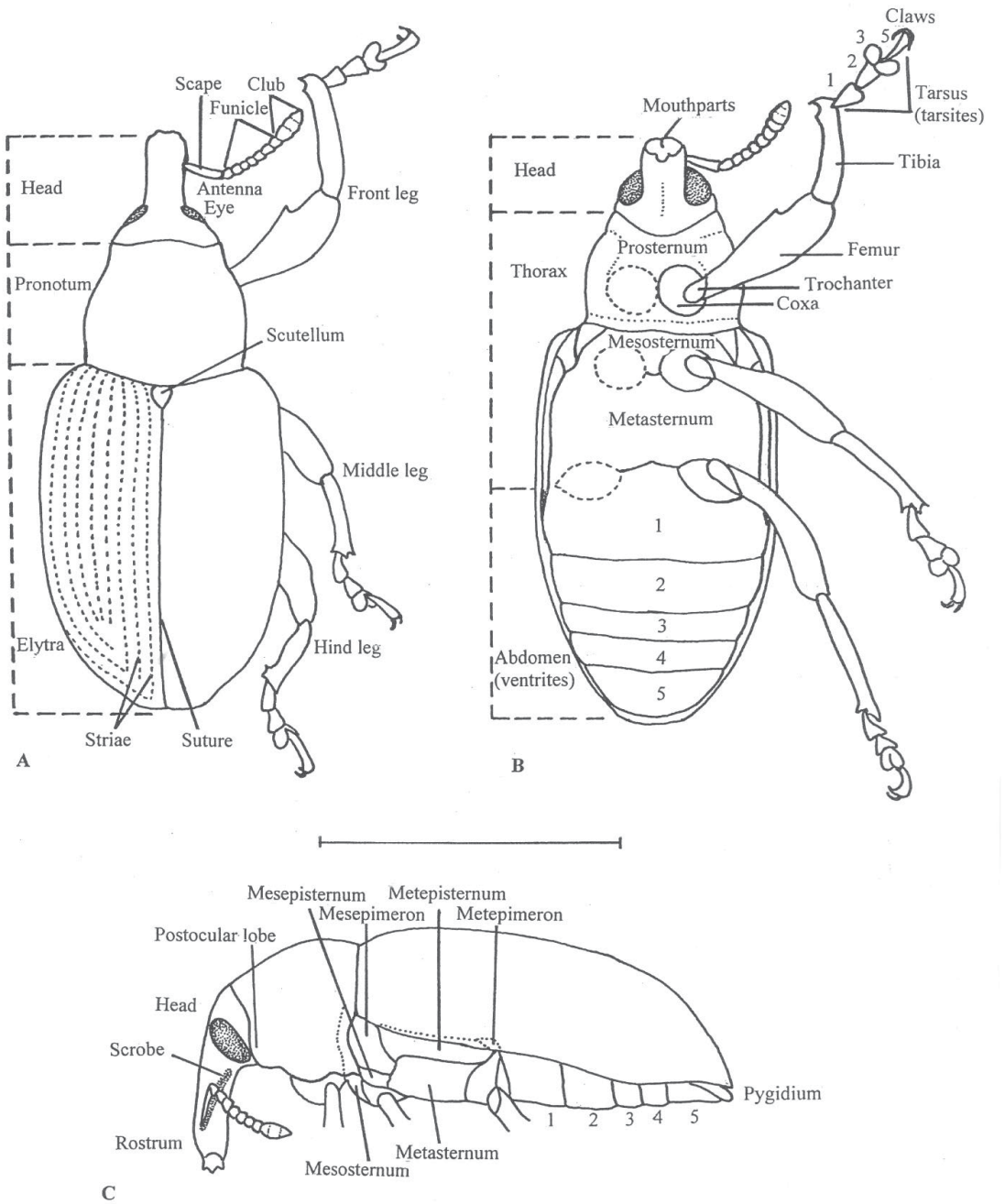

Fig. 1: Morphology of a generalized Curculionidae: (A) dorsal habitus; (B) ventral habitus; (C) lateral habitus. *Heilipodus argentinicus* (Heller) (Molytinae, Hylobiini). Scale = 1 cm.

Morfología de un Curculionidae generalizado: (A) hábito dorsal; (B) hábito ventral; (C) hábito lateral. *Heilipodus argentinicus* (Heller) (Molytinae, Hylobiini). Escala = 1 cm.

RESULTS AND DISCUSSION

Structures and taxonomic characters

Antennae (Fig. 2). The typical antennae of the Curculionoidea has 11 articles, but the basic number is 12, being the last article usually fused with article 11. The basal article is the "scape", followed by the "funicle" of seven articles, and by a three articulated terminal "club" (Fig. 1A). In most weevils except Curculionidae (e.g., Nemonychidae, Anthribidae, Belidae, Attelabidae, Caridae, and Brentidae) the antennae are straight, with a scape quite short (about as long as funicular article 1) and the funicle joined in line with the scape (Fig. 2A to 2C, 2G and 2H). In Curculionidae the antennae are geniculate (= elbowed), with the scape elongate (distinctly longer than funicular article 1) and the funicle obliquely joined to the scape (Fig. 2D and 2E).

The number of funicular articles can be reduced to six, five or even four, in some weevil taxa. For example in Dryopthorinae the funicle has six or less articles, because the last funicular article is added to the club, forming a basal shiny portion of it (Fig. 2E). The club may be compact, as in Curculionidae (Fig. 2D), or loosely articulated as in most basal families (Fig. 2A and 2B). In the latter case the club may be indistinct when its articles are similar to those of the funicle, e.g., in some Belidae (Fig. 2A), but the club articles are usually recognised for being wider and more pilose (Fig. 2B and 2H). The males of *Cylas formicarius* (Fabricius) (Brentidae, Cyladinae) have a particular antenna with nine articles followed by a very elongate club formed by articles 10-11 (Fig. 2C).

Antennae are usually inserted between midlength and apex of the rostrum (Fig. 2F), and in some cases near rostral base (Fig. 2G). The insertion is mostly lateral, but some weevils have dorsal or ventral (Fig. 2H) antennal insertions.

Rostrum (Fig. 3). The presence of a rostrum extended beyond the eyes, with mouth-parts situated at its apex, is one of the most typical features of Curculionoidea (Fig. 1C). The shape, length and width of the rostrum show great variation among weevil taxa, from long and slender (e.g., "long-nosed weevils", as Curculioninae) (Fig. 3C) to short and broad (e.g., "broad-nosed weevils, as Entiminae) (Fig. 3B), and it can be reduced or even absent (Fig. 3A) in some specialised groups (e.g., Scolytinae, Platypodinae). The rostrum is frequently sexually dimorphic, particularly in those weevils that use it for oviposition site preparation (e.g., in females the rostrum is usually longer and with antennal insertion more basal than in males).

The lateral rostral grooves for the reception of the scape in repose are called "scrobes" (Fig. 1C), which may have different extension and curvature (Fig. 3B to 3E).

Some weevils have a ventral cavity or sternal channel for the reception of the rostrum in repose (Fig. 3F and 3G). The channel may be only prosternal, it can also comprise the mesosternum, and in some few cases it extends to the metasternum, or even further, towards ventrites. In Cryptorhynchinae, the channel ends in a cup-like receptacle (Fig. 3G).

Ventral surface of head and mouth-parts (Fig. 4). In most weevils, the ventral surface of the head has a single median gular suture (Fig. 4E), anteriad to postoccipital suture, and thus the gula is indistinct (see Lyal 1995). Only in some basal weevils (e.g., Nemonychidae, Belidae) the gular sutures are separate (Fig. 4G) and delimite a gular sclerite or gula, located between the submentum and the neck membrane.

Mouth-parts are located at the apex of the rostrum (Fig. 1B). The labrum and the clypeolabral suture (dorsal view) are indistinct in most Curculionoidea (Fig. 4B), except in Nemonychidae and Anthribidae (Fig. 4A). The labium (ventral view) has a prementum, which can be pedunculate, and a posterior sclerite called submentum, also regarded as "pregula" (Fig. 4E). The extent to which the labial prementum covers the maxillae determines two types of mouth-parts: in the Adelognathous type the maxillae are hidden by a enlarged prementum (Fig. 4D), and in the Phanerognathous type the maxillae are visible continuously at sides of the prementum (Fig. 4E). When the prementum is relatively small, it is usually pedunculate (Fig. 4E). Characters of the labial and maxillary palpi, such as insertion, direction and number of articles are useful as taxonomic characters at family and subfamily levels. The maxillary palpi are elongate and projecting in those basal weevils with a distinct labrum (Fig. 4C), and compact in the remaining curculionoids (Fig. 4D, 4E and 4F).

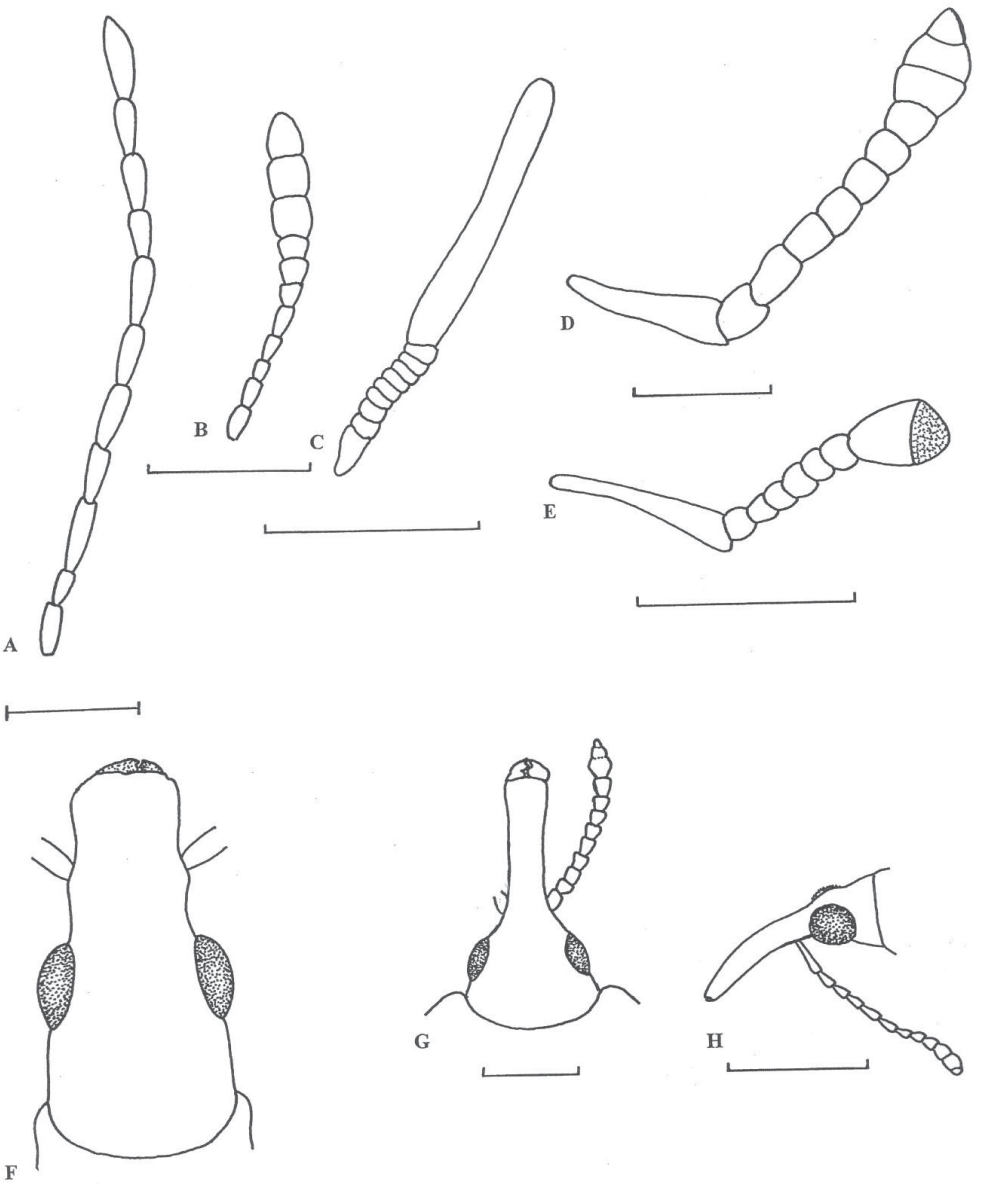

Fig. 2: Types of antennae and antennal insertion: (A) straight with loosely articulate club, *Dicordylus annulifer* (Philippi) (Belidae, Belinae); (B) idem, Attelabidae, Rhynchitinae; (C) straight with elongate club formed by articles 10-11, *Cylas formicarius* (Fabricius), male (Brentidae, Cyladinae); (D) geniculate with compact club, *Heilipodus argentinicus* (Heller) (Curculionidae, Molytinae, Hylobiini); (E) geniculate with truncate-conical club, *Sphenophorus* sp. (Curculionidae, Dryophtorinae); (F) antennae inserted near midlength of rostrum, dorsal view, *Dicordylus annulifer* (Philippi) (Belidae, Belinae); (G) antennae inserted near rostral base, dorsal view, *Hydnorobius hydnorae* (Pascoe) (Belidae, Oxycoryninae); (H) antennae inserted ventrally, lateral view, *Caenominurus topali* Voss (Caridae). Scale = 1mm, except C = 0.5 mm.

Tipos de antenas y de inserciones antenales: (A) recta, con artejos de la clava flojamente articulados, *Dicordylus annulifer* (Philippi) (Belidae, Belinae); (B) idem, Attelabidae, Rhynchitinae; (C) recta con clava elongada, formada por los artejos 10-11, *Cylas formicarius* (Fabricius), macho (Brentidae, Cyladinae); (D) geniculada, con clava compacta, *Heilipodus argentinicus* (Heller) (Curculionidae, Molytinae, Hylobiini); (E) geniculada con clava truncado-cónica, *Sphenophorus* sp., (Curculionidae, Dryophtorinae); (F) antena insertada cerca de la mitad de la longitud del rostro, vista dorsal, *Dicordylus annulifer* (Philippi) (Belidae, Belinae); (G) antena insertada cerca de la base del rostro, vista dorsal, *Hydnorobius hydnorae* (Pascoe) (Belidae, Oxycoryninae); (H) antena insertada ventralmente, vista lateral, *Caenominurus topali* Voss (Caridae). Escala = 1mm, excepto C = 0.5 mm.

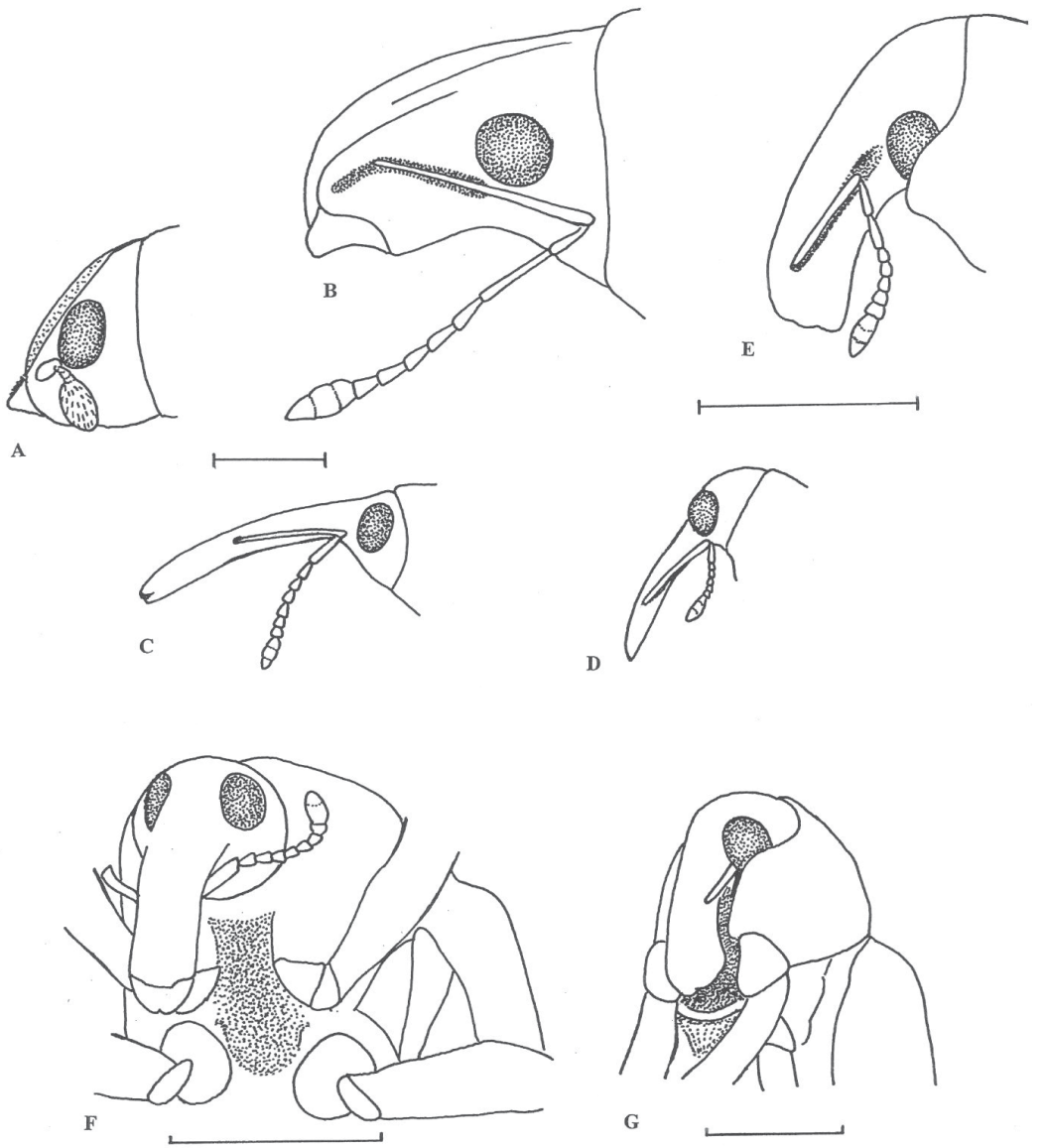

Fig. 3: Characters of rostrum: (A) vestigial**,** *Megaplatypus mutatus* (Chapuis) (Curculionidae, Platypodinae); (B) short and broad, "broad-nosed weevils", *Naupactus xanthographus* (Germar) (Curculionidae, Entiminae); (C) long and slender, "long-nosed weevils", *Celetes trithrinacis* Bondar (Curculionidae, Curculioninae**,** Derelomini); (D) scrobe extended towards venter of rostrum, lateral view, *Omoides flavipes* (Blanchard) (Curculionidae, Eugnominae); (E) scrobe not extended towards venter of rostrum, lateral view, *Listronotus argentinensis* (Hustache) (Curculionidae, Rhythirininae); (F) prosternal channel for the reception of rostrum in repose, antero-lateral view, *Cratosomus fasciatus* Perty (Curculionidae, Conoderinae); (G) prosternal channel with cup-like receptacle, antero-lateral view, *Faustinus cubae* (Boheman) (Curculionidae, Cryptorhynchinae). Scale = 1 mm, except F = 5 mm.

Caracteres del rostro: (A) vestigial**,** *Megaplatypus mutatus* (Chapuis) (Curculionidae, Platypodinae); (B) corto y ancho, "gorgojos de rostro ancho", *Naupactus xanthographus* (Germar) (Curculionidae, Entiminae); (C) largo y delgado, "gorgojos de rostro largo", *Celetes trithrinacis* Bondar (Curculionidae, Curculioninae, Derelomini); (D) escroba extendida hacia la superficie ventral del rostro, vista lateral, *Omoides flavipes* (Blanchard) (Curculionidae, Eugnominae); (E) escroba no extendida hacia la superficie ventral del rostro, vista lateral, *Listronotus argentinensis* (Hustache) (Curculionidae, Rhythirrininae); (F) canal prosternal para la recepción del rostro en reposo, vista antero-lateral, *Cratosomus fasciatus* Perty (Curculionidae, Conoderinae); (G) canal prosternalcon receptáculo en forma de copa, vista antero-lateral, *Faustinus cubae* (Boheman) (Curculionidae, Cryptorhynchinae). Escalas = 1 mm, excepto F = 5 mm.

The mandibles are relatively large, robust, and setose and/or squamose in "broad-nosed weevils", and usually smaller, glabrous or with few setae in "long-nosed weevils". Moreover, the mandibles of broad-nosed weevils usually bear a scar, left by a deciduous process (Fig. 4D). These processes or cusps have different sizes and shapes (see Thompson 1992), being presumably used by the adult to emerge from the pupal cell and to dig its way out of the soil. They are subsequently lost by active dehiscence when feeding takes place.

The inner margin of the mandibles is usually dentate, but the outer edge is not (Fig. 4A and 4E), except in some groups such as Rhynchitinae, with exodontous mandibles (with teeth on outer edge) (Fig. 4B). In most weevils the mandibles are attached laterally, having a quite horizontal movement, but in Curculionini the attachment point is located dorsally and the mandibles move vertically.

Eyes, frons and head (Fig. 5). Eyes are usually faceted, except in some Brentinae which have smooth eyes (with indistinct ommatidia). The shape, convexity, relative size and position of the eyes provide valuable characters. They can be round (Fig. 5A), longitudinally oval (Fig. 5B and 5C) or transversely oval (Fig. 5E); flat to strongly convex (Fig. 5G and 5H), reduced to absent (e.g., some Cossoninae that inhabit caves), or very large and dorsally contiguous (e.g., several Conoderinae) (Fig. 5F).

The frons may be broad (Fig. 5G) or narrow (Fig. 5F) depending on the relative size and proximity of the eyes. In some taxa there are superciliar arcs (e.g., some Aterpinae), preocular or postocular constrictions or impressions, or postocular lobes (e.g., Rhythirrininae) (Fig. 3E). The postocular lobes are projections of the antero-lateral margins of the pronotum, that could partially conceal the eyes (Fig. 5D).

The head usually extends a short distance from posterior margin of the eyes to the anterior margin of the pronotum, but sometimes (e.g., in most Eugnominae, some Brentinae) it is markedly prolonged behind the eyes (Fig. 6A). It could be as wide as the pronotum or narrower than the pronotum, visible from dorsal view (Fig. 5I) or concealed by the pronotum (Fig. 5J).

Prothorax and elytra (Fig. 6 and 7A to 7G). The outline of the prothorax and the elytra (elytral disc) determine the overall shape of the body (Fig. 6A to 6G). Pronotum is usually wider than long (Fig. 6D to 6G), with few exceptions (e.g., the Curculioninae Erodiscini, mimic of ants) (Fig. 7A). It is not carinate except in some basal taxa (e.g., Anthribinae, Belidae Oxycoryninae) (Fig. 7B and 7C).

Elytra could be abbreviated, leaving terminal tergites (pygidium) uncovered (Fig. 7D and 7E). In Mesoptiliinae, the elytral base is extended forward, concealing the base of the pronotum (Fig. 7D). In some taxa with ascending mesepimeron, this pleural sclerite is seen between the basal angles of the pronotum and the elytra (Fig. 7E). Elytral striae are usually 10, numbered from the suture to the elytral margin (Fig. 1A, 7D and 7G). The spaces between striae are called intervals or interstriae. Irregularly punctuated elytra have indistinct striae, and in certain species there are supernumerary striae.

Pleural sclerites (Fig. 1C, 7E and 7F). The pleural sclerites of meso and metathorax are mesepisternum, mesepimeron, metepisternum and metepimeron (Fig. 1C). The mesepimeron has value as taxonomic character. Some subfamilies and tribes of Curculionidae are easily recognized by the ascending mesepimeron (e.g., Baridinae, Conoderinae, and Curculioninae of the tribe Ceutorhynchini) (Fig. 7E).

Another useful sclerite is the metepimeron, which may be exposed (Fig. 7F) or covered by the elytra (Fig. 1C). In the latter case, its vestiture is thinner and sparser than that of the metepisternum.

Legs (Fig. 8 and 9). Legs provide numerous diagnostic characters for the identification of higher taxa of Curculionoidea (Fig. 1A and 1B). The front coxae may be contiguous (Fig. 1B), subcontiguous (Fig. 8A), or separate from each other (Fig. 8C). The trochanter is usually reduced and subtriangular, with the femur attached to its side (Fig. 8C); in Apioninae the trochanter is conspicuous and subcylindrical, with the femur attached to its apex (Fig. 8D). The three pairs of femora are either similar to each other, or the front or hind femora are different by being distinctly broader, longer or by having a large tooth, e.g., Curculioninae of the tribes Camarotini, Prinonobrachiini (Fig. 8E) and Rhamphini (Fig. 8F). The front legs frequently show sexual dimorphism, being thicker and longer in the males.

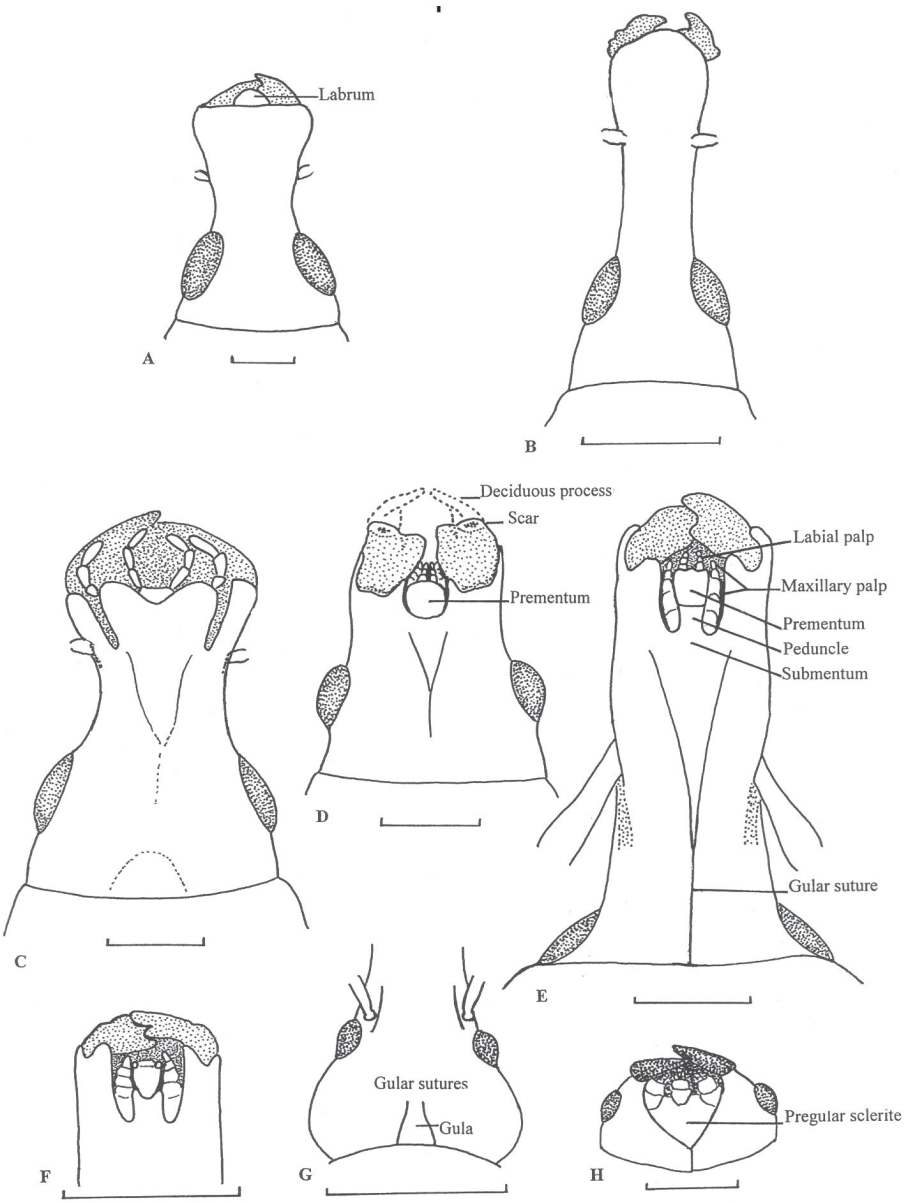

Fig. 4: Characters of mouth-parts: (A) Labrum distinct, mandibles lacking teeth on outer edge, dorsal, Anthribidae, Anthribinae; (B) Labrum indistinct, mandibles exodontous, Attelabidae, Rhynchitinae; (C) maxillary palpi elongate and projecting, ventral, Anthribidae, Anthribinae; (D) mouth-parts of Adelognathous type (maxillae hidden by enlarged prementum), ventral, *Naupactus xanthographus* (Germar) (Curculionidae, Entiminae); (E) mouth-parts of Phanerognathous type (maxillae visible on each side of prementum), ventral, *Heilipodus argentinicus* (Heller) (Curculionidae**,** Molytinae, Hylobiini); (F) labial palpi seemingly one-segmented, ventral, *Lixus* sp. (Curculionidae, Lixinae); (G) gular sutures separate, ventral, Belidae, Oxycoryninae; (H) pregular sclerite distinct, ventral, *Megaplatypus mutatus* (Chapuis) (Curculionidae, Platypodinae). Scales = 1 mm.

Caracteres de la piezas bucales: (A) Labro conspicuo, mandíbulas sin dientes en la superficie externa, vista dorsal, Anthribidae, Anthribinae; (B) Labro inconspicuo, mandíbulas exodontas, Attelabidae, Rhynchitinae; (C) palpos maxilares elongados y proyectados, vista ventral, Anthribidae, Anthribinae; (D) piezas bucales de tipo Adelognato (maxilas cubiertas por un prementón amplio), vista ventral, *Naupactus xanthographus* (Germar) (Curculionidae, Entiminae); (E) piezas bucales de tipo Fanerognato (maxilaa visibles a cada lado del prementón), vista ventral, *Heilipodus argentinicus* (Heller) (Curculionidae**,** Molytinae, Hylobiini); (F) palpos labiales aparentemente con un solo segmento, vista ventral, *Lixus* sp. (Curculionidae, Lixinae); (G) suturas gulares separadas, vista ventral, Belidae, Oxycoryninae; (H) esclerito pregular conspicuo, vista ventral, *Megaplatypus mutatus* (Chapuis) (Curculionidae, Platypodinae). Escalas = 1 mm.

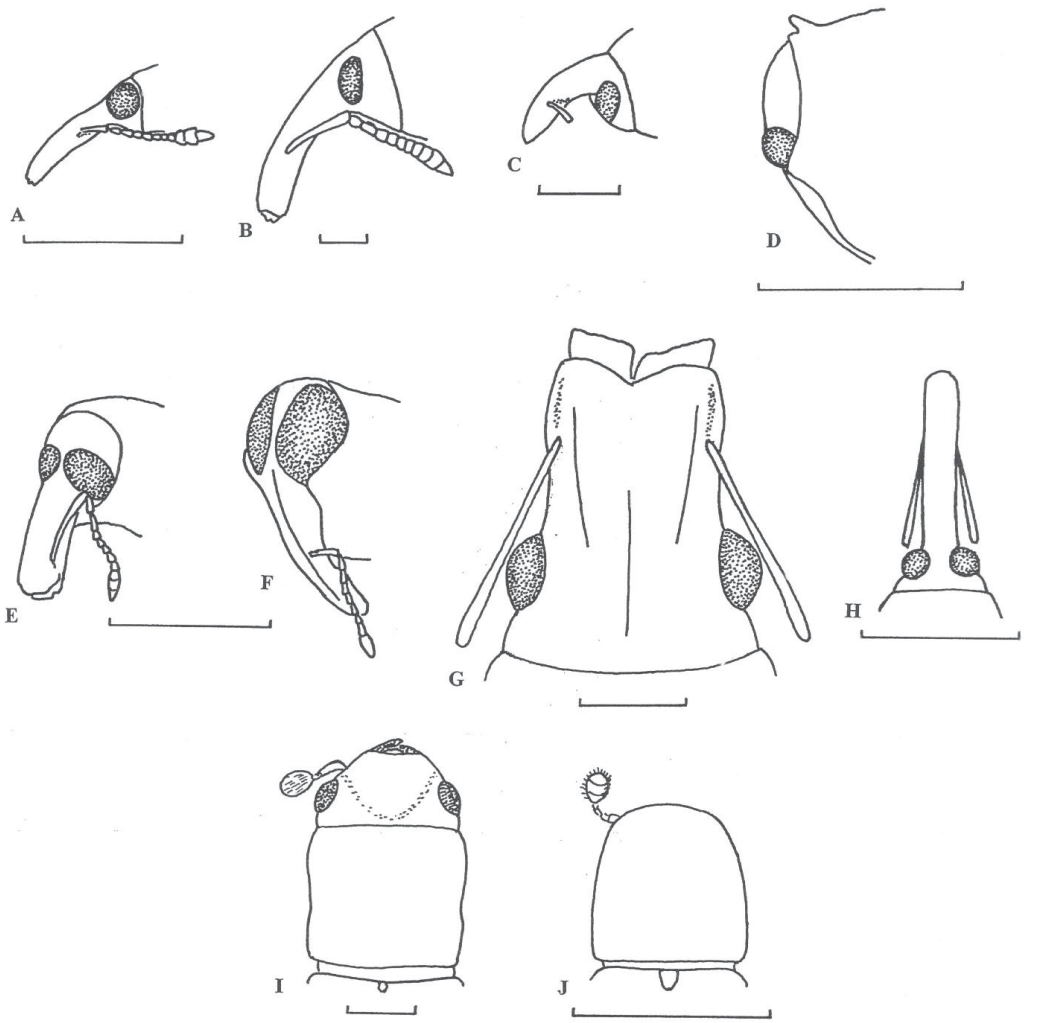

Fig. 5: Characters of eyes, frons and head: (A) eyes round, lateral view, *Apion lativentre* Béguin-Billecocq (Brentidae, Apioninae); (B) longitudinally oval, lateral view, *Lixus* sp., (Curculionidae, Lixinae); (C) longitudinally oval and ventrally aproximate, lateral view, *Baris vianai* Hustache (Curculionidae, Baridinae); (D) partially covered by postocular lobes, lateral view, *Ceutorhynchus argentinensis* (Hustache) (Curculionidae, Curculioninae Ceutorhynchini); (E) transversely oval, antero-lateral view, *Phelypera schuppeli* (Boheman) (Curculionidae, Hyperinae); (F) dorsally contiguous, antero-lateral view, *Eulechriops manihoti* Monte (Curculionidae, Conoderinae); (G) head of a "broad-nosed weevil", dorsal view, *Naupactus xanthographus* (Germar) (Curculionidae, Entiminae); (H) head of a long-nosed weevil", dorsal view, *Anthonomus sisymbrii* Hustache (Curculionidae, Curculioninae, Anthonominae); (I) head as wide as prC onotum and exposed in dorsal view, *Megaplatypus mutatus* (Chapuis) (Urculionidae, Platypodinae); (J) head narrower than pronotum and concealed by it in dorsal view, *Pityophthorus* sp. (Curculionidae, Scolytinae). Scale = 1 mm.

Caracteres de los ojos, frente y cabeza: (A) ojos redondos, vista lateral, *Apion lativentre* Béguin-Billecocq (Brentidae, Apioninae); (B) longitudinalmente ovales, vista lateral, *Lixus* sp. (Curculionidae, Lixinae); (C) longitudinalmente ovales y ventralmente aproximados, vista lateral, *Baris vianai* Hustache (Curculionidae, Baridinae); (D) parcialmente cubiertos por lóbulos oculares, vista lateral, *Ceutorhynchus argentinensis* (Hustache) (Curculionidae, Curculioninae Ceutorhynchini); (E) transversalmente ovales, vista antero-lateral, *Phelypera schuppeli* (Boheman) (Curculionidae, Hyperinae); (F) dorsalmente contiguos, vista antero-lateral, *Eulechriops manihoti* Monte (Curculionidae, Conoderinae); (G) cabeza de un "gorgojo de rostro ancho", vista dorsal, *Naupactus xanthographus* (Germar) (Curculionidae, Entiminae); (H) cabeza de un "gorgojo de rostro largo", vista dorsal, *Anthonomus sisymbrii* Hustache (Curculionidae, Curculioninae, Anthonominae); (I) cabeza tan ancha como el pronoto y visible dorsalmente, *Megaplatypus mutatus* (Chapuis) (Curculionidae, Platypodinae); (J) cabeza más angosta que el pronoto y oculta por este último en vista dorsal, *Pityophthorus* sp., (Curculionidae, Scolytinae). Escala = 1 mm.

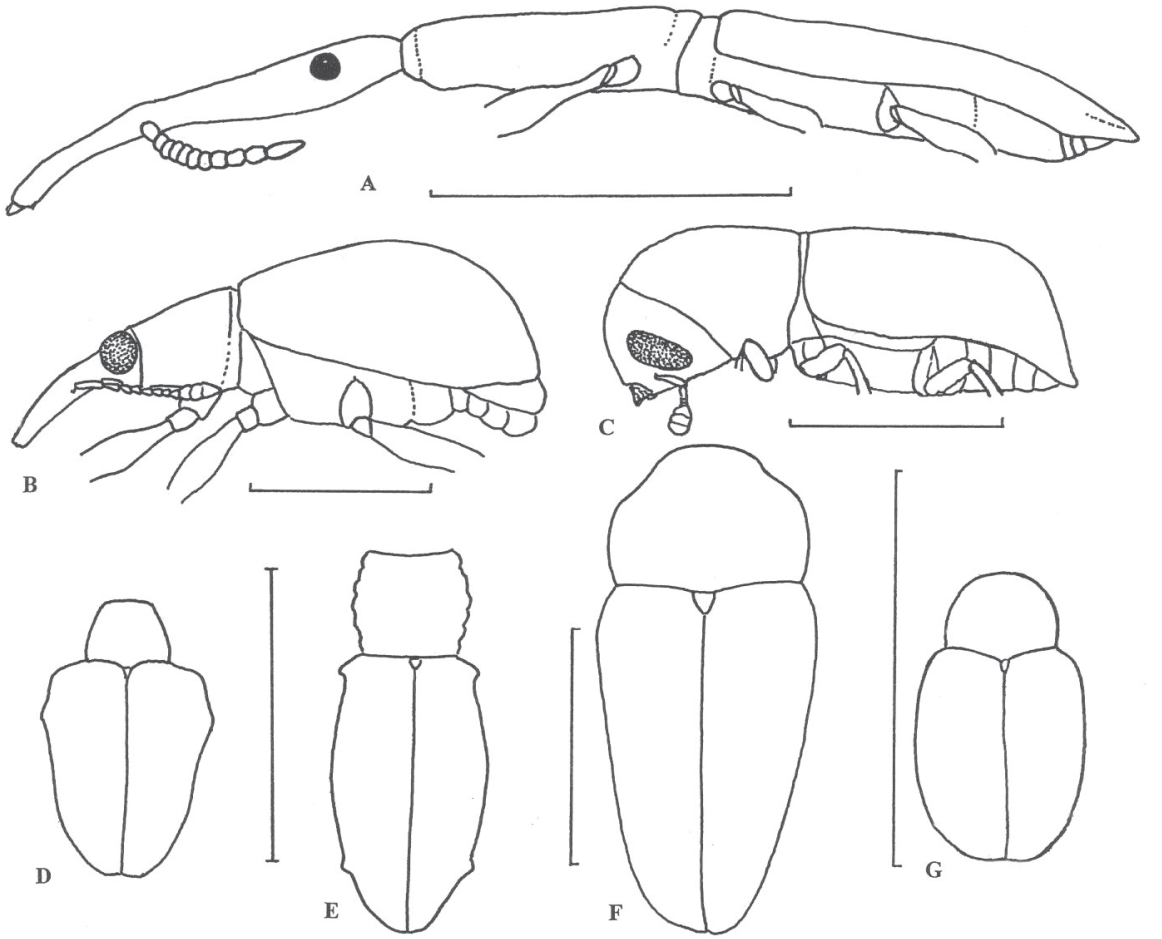

Fig. 6: Body shape (prothorax plus elytra): (A) elongate body form, with stepped ventrites, lateral view, *Brentus anchorago* (L) (Brentidae, Brentinae); (B) pyriform body form, with stepped ventrites, lateral view, *Apion lativentre* Béguin-Billecocq (Brentidae, Apioninae); (C) cylindrical body form, lateral view, *Pityophthorus* sp. (Curculionidae, Scolytinae); (D) rhomboidal body shape, not tuberculate, dorsal view, *Gonipterus gibberus* Boisduval (Curculionidae, Gonipterinae); (E) elongate and subparallel-sided, tuberculate, dorsal view, *Aegorhinus superciliosus* (Guérin) (Curculionidae, Aterpinae); (F) subrhomboidal body shape, dorsal view, *Ameris ynca* (Sahlberg) (Curculionidae, Molytinae, Cholini); (G) broadly oval body shape, dorsal view, *Spermologus rufus* Boheman (Curculionidae, Molytinae, Petalochiliini). Scales = 1 cm, except B and C = 1mm.

Forma del cuerpo (protórax más élitros): (A) cuerpo elongado, ventritos escalonados en vista lateral, *Brentus anchorago* (L) (Brentidae, Brentinae); (B) cuerpo piriforme, ventritos escalonados en vista lateral, *Apion lativentre* Béguin- Billecocq (Brentidae, Apioninae); (C) cuerpo subcilíndrico, vista lateral, *Pityophthorus* sp. (Curculionidae, Scolytinae); (D) cuerpo romboidal, élitros no tuberculados, vista dorsal, *Gonipterus gibberus* Boisduval (Curculionidae, Gonipterinae); (E) cuerpo elongado y de lados subparalelos, con élitros tuberculados, vista dorsal, *Aegorhinus superciliosus* (Guérin) (Curculionidae, Aterpinae); (F) cuerpo subromboidal, vista dorsal, *Ameris ynca* (Sahlberg) (Curculionidae, Molytinae, Cholini); (G) cuerpo anchamente oval, vista dorsal, *Spermologus rufus* Boheman (Curculionidae, Molytinae, Petalochiliini). Escala = 1 cm, excepto B y C = 1 mm.

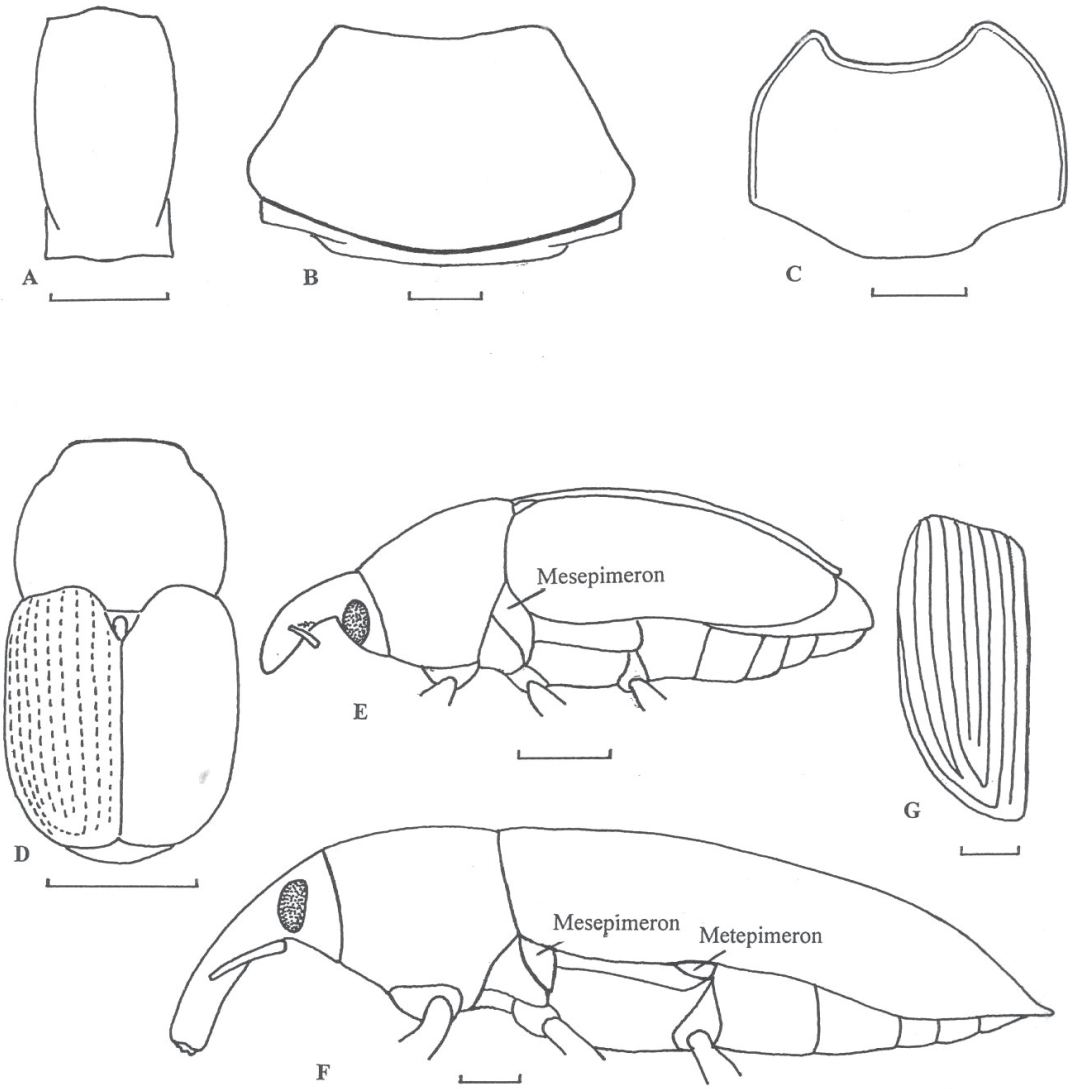

Fig. 7: Characters of prothorax, elytra and pleural sclerites: (A) pronotum longer than wide, *Erodiscus attenuatus* (Fabricius) (Curculionidae, Curculioninae**,** Erodiscini); (B) pronotum wider than long, with transverse basal or prebasal carina, Anthribidae, Anthribinae; (C) pronotum laterally carinate, *Hydnorobius hydnorae* (Pascoe) (Belidae, Oxycoryninae; (D) elytra abbreviated (pygidium exposed), with their base extended over the pronotum, dorsal view, *Laemosaccus ebenus* Pascoe (Curculionidae, Mesoptiliinae); (E) mesepimeron ascending, visible between basal angles of pronotum and elytra, lateral view, *Baris vianai* Hustache (Curculionidae, Baridinae); (F) mesepimeron not ascending, metepimeron exposed (not covered by elytron), lateral view, *Lixus* sp. (Curculionidae, Lixinae); (G) elytral striae 3 joining stria 8, lateral, *Ameris ynca* (Sahlberg) (Curculionidae, Molytinae, Cholini); (H) elytral stria 3 joining stria 6, dorsal view, *Spermologus rufus* Boheman (Curculionidae, Molytinae, Petalochiliini). Scales = 1 mm, except F = 1 cm.

Caracteres del protórax, élitros y escleritos pleurales: (A) pronoto más largo que ancho, *Erodiscus attenuatus* (Fabricius) (Curculionidae, Curculioninae**,** Erodiscini); (B) pronoto más ancho que largo, con una carena transversal basal o prebasal, Anthribidae, Anthribinae; (C) pronoto carenado lateralmente, *Hydnorobius hydnorae* (Pascoe) (Belidae, Oxycoryninae; (D) élitros abreviados (pigidio expuesto), con su base extendida sobre el pronoto, vista dorsal, *Laemosaccus ebenus* Pascoe (Curculionidae, Mesoptiliinae); (E) mesepimeron ascendente, visible entre los ángulos basales de pronoto y élitros, vista lateral, *Baris vianai* Hustache (Curculionidae, Baridinae)); (F) mesepimeron no ascendente, metepimeron expuesto (no cubierto por los élitros), vista lateral, *Lixus* sp. (Curculionidae, Lixinae); (G) estría elitral 3 unida con la estría 8, vista lateral, *Ameris ynca* (Sahlberg) (Curculionidae, Molytinae, Cholini); (H) estría elitral 3 unida con la estría 6, vista dorsal, *Spermologus rufus* Boheman (Curculionidae, Molytinae, Petalochiliini). Escalas = 1 mm, excepto F = 1 cm.

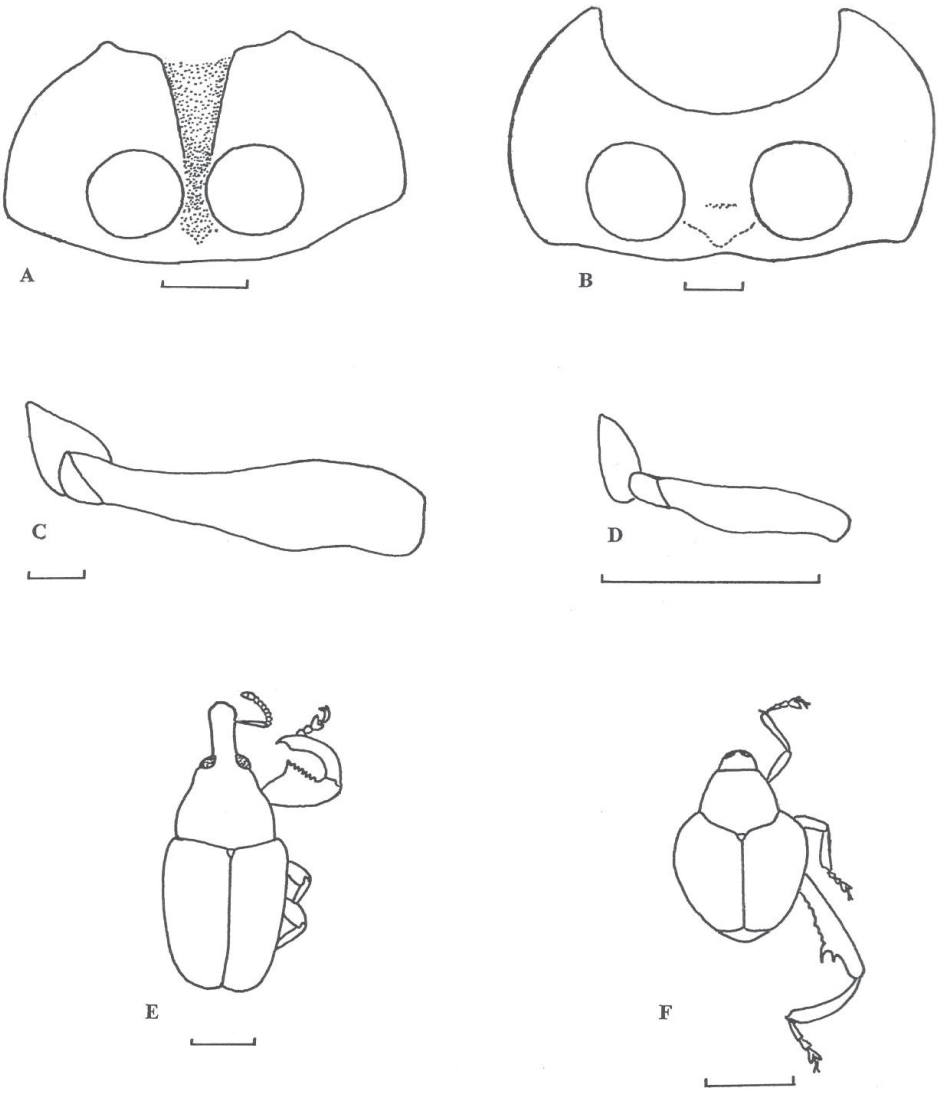

Fig. 8: Characters of coxae, trochanters and femora: (A) front coxae subcontiguous, separated by less than 1/2 of coxal width, prosternal channel present, ventral view, *Rhyssomatus diversicollis* Heller, Fahraeus (Curculionidae, Molytinae, Cleogonini); (B) front coxae separated by at least 1/2 of coxal width, prosternal channel absent, *Ameris ynca* (Sahlberg) (Curculionidae, Molytinae, Cholini); (C) trochanter reduced and triangular, lateral view, *Heilipodus argentinicus* (Heller) (Curculionidae, Molytinae, Hylobiini); (D) trochanter conspicuous and subcylindrical, lateral view, *Apion* sp. (Brentidae, Apioninae); (E) front femur larger than middle and hind femora, and with a large tirangular tooth, serrate on anterior margin, dorsal view, *Prionobrachium bimaculatum* Hustache (Curculionidae, Curculioninae, Prionobrachiini); (F) hind femur distinctly longer and stouter than front and middle femora (jumping forms), dorsal view, *Tachygonus argentinus* Viana (Curculionidae, Curculioninae, Rhamphini). Scale = 1 mm.

Caracteres de las coxas, trocánteres y fémures: (A) coxas anteriores subcontiguas, separadas por menos de las mitad del ancho de cada coxa, canal prosternal presente, vista ventral, *Rhyssomatus diversicollis* Heller, Fahraeus (Curculionidae, Molytinae, Cleogonini); (B) coxas anteriores separadas por al menos la mitad del ancho de cada coxa, canal prosternal ausente, *Ameris ynca* (Sahlberg) (Curculionidae, Molytinae, Cholini); (C) trocánteres reducidos y triangulares, vista lateral, *Heilipodus argentinicus* (Heller) (Curculionidae, Molytinae, Hylobiini); (D) trocánteres conspicuos y subcilíndricos, vista lateral, *Apion* sp. (Brentidae, Apioninae); (E) fémures anteriores más anchos que los medianos y posteriores, con un diente triangular grande, aserrado en el margen anterior, vista dorsal, *Prionobrachium bimaculatum* Hustache (Curculionidae, Curculioninae, Prionobrachiini); (F) fémures posteriores conspiculamente más largos y robustos que los anteriores y medianos (formas saltadoras), vista dorsal, *Tachygonus argentinus* Viana (Curculionidae, Curculioninae, Rhamphini). Escala = 1 mm.

Tibial apex (Fig. 9A to 9M). The tibia may be apically unarmed, or it can bear an apical tooth (mucro) (Fig. 9A), a hook (uncus) (Fig. 9C) or one or two spurs (Fig. 9B). These processes can be recognized as follows: mucro (Fig. 9A), a tooth-like process arising from the inner apical angle, not continuous with the outer tibial margin. Mucronate tibiae are common among leaf-cuting or ground-dwelling curculionoids, such as many broad-nosed weevils (e.g., Entiminae, Rhythirrininae); uncus (Fig. 9C and 9E), a hook-like process (curved spine) arising from, or continuous with the *outer* apical angle of tibia. In some species the uncus is situated more inwards (in the middle or closer to the inner apical angle) and therefore, can be confused with a mucro. If it is also not stoutly curved, then the aspect of the apical comb of setae may help to recognize the uncus condition (see below). Uncinate tibiae are mainly present in weevils associated with wood or bark that use to climb trunks (e.g., Molytinae, Cryptorhynchinae); premucro (Fig. 9E), a secondary tooth, located on the inner apical angle of the uncinate tibiae (Kuschel 1951, Thompson 1992), thus, a particular tibia can have both, uncus and premucro (e.g., some Molytinae). The base of the premucro is usually flanked by a pair of tufts of long setae (Fig. 9E).

Based on comparative studies, it has been proposed that mucro and uncus are homologous (Kuschel 1951, Thompson 1992), corresponding to the same structure (apical tooth) with different degrees of development and placement. Since homologous structures cannot co-occur in the same organism according to the criteria of conjunction (Patterson 1982), it follows logically that a particular tibia cannot be both mucronate and uncinate, then, mucro and uncus are different states of the same character. On the contrary, uncus and premucro are non-homologous, and can take place in the same tibia.

Spurs (Fig. 9B). They are one or two fortified setae at the inner apical margin of the tibia, sometimes occurring in addition to the mucro (Fig. 9B) (Kuschel et al. 2000). Tibial spurs are present in many species of Nemonychidae, Belidae, Attelabidae, Caridae, and Brentidae, but occur only sporadically in Curculionidae (e.g., some Erirhininae, Entiminae Cylydrorhinini, and Rhythirrininae) (Zimmerman 1993, 1994a, 1994b; Kuschel 1995).

Tibial combs (Fig. 9A, 9B and 9E). The tibiae of weevils usually have rows of modified setae at the apex, around the tarsal articulation, except in some groups such as Cossoninae (Fig. 9C). The apical comb of setae is generally more developed on the hind tibiae, and it can be oriented either transversely (Fig. 9A and 9B) or obliquely to subparallel (Fig. 9E) regarding the tibial axis. When mucronate and uncinate conditions are not clear, the apical comb of setae may help to discriminate between them: In mucronate tibiae the apical comb is transverse (Fig. 9A and 9B) and curved; in uncinate tibiae the apical comb can be present or absent, if present, it is usually oblique or subparallel to tibial axis (Fig. 9E), and it is not or only slightly curved (Marshall 1932, Kuschel 1951, Thompson 1992). Besides the previously described processes, the front tibae of some weevil taxa (e.g., Belidae, Curculionidae Cossoninae) have particular grooming devices (Fig. 9F to 9I).

Tarsi (Fig. 9A to 9M). Curculionoidea have five tarsal articles (tarsites), but in most cases the tarsi appear to be four segmented (pseudotetramerous) (Fig. 1B) because tarsite 4 is minute and concealed between the usually bilobate tarsite 3; tarsite 5 usually bears a pair of claws (Fig. 9J to 9M), and exceptionally a single tarsal claw. Tarsal claws may be free (independent or separate from each other) (Fig. 9J, 9L and 9M), or connate (inner faces are contiguous in their basal half) (Fig. 9K); simple (Fig. 9J), or appendiculate (Fig. 9L) when they bear a process or tooth at the base, which in some cases can be as long as the claw. In Dryophthorinae there are dorsal and ventral lobes between the claws (Fig. 9M).

Abdomen and male genitalia (Fig. 10). Visible abdominal sternites are five (numbers three to seven), because sternites one and two have been absorved into the hind coxal cavity. They are usually called ventrites and numbered from one to five (Fig. 1B and 1C). In basal weevil families, the ventrites are usually free (not fused) and similar in length (see Thompson 1992), but in the majority of weevils the first two ventrites are fused together and are frequently larger than the remaining (Fig. 1B, 10A and 10B). Flexure of the venter has thus been increasingly concentrated on the short

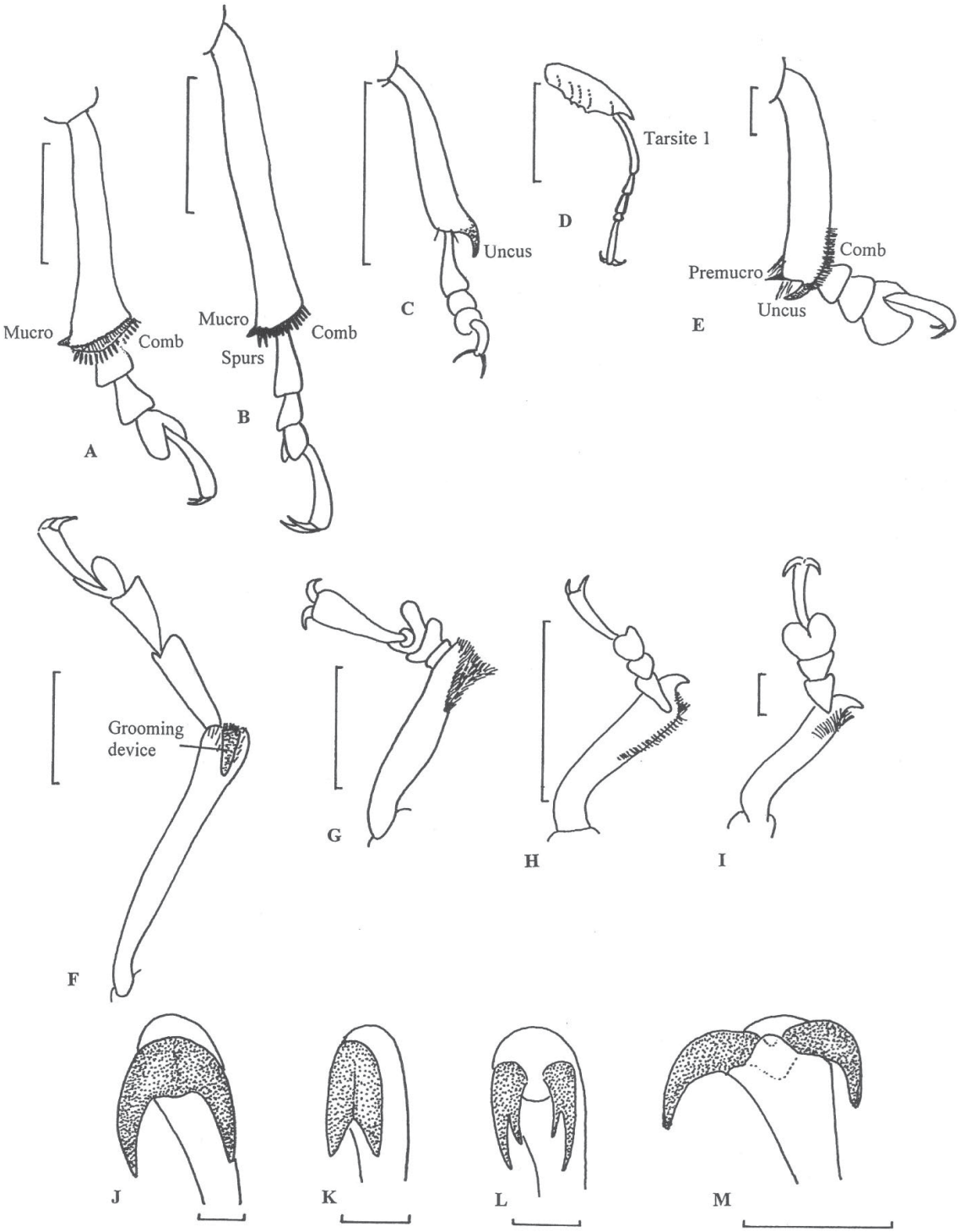

Fig. 9: Characters of tibial apex, tarsus, and tarsal claws: (A) hind tibia and tarsus, tibial apex with mucro, outer view, *Platyaspistes argentinensis* Kuschel (Curculionidae, Entiminae); (B) hind tibia and tarsus, tibial apex with mucro and spurs, outer view, *Listroderes costirostris* Schoenherr (Curculionidae, Rhythirininae); (C) hind tibia and tarsus, tibial apex with uncus, lacking tibial comb, tarsite 3 not bilobed, outer view, *Cossonus fossatus* Boheman (Curculionidae, Cossoninae); (D) front tibia and tarsus, tibial apex with uncus, all five tarsites distinct and cylindrical, tarsite 1 elongate; (E) hind tibia and tarsus, tibial apex with uncus and premucro, having tibial comb, tarsite

ventrites three and four, which eventually form a hinge with which the ventrite five articulates in order to open and close the apex of the abdomen (Thompson 1992).

Abdominal tergites one-seven are located beneath the elytra and are less sclerotized than the sternites, with functional spiracles placed on their lateral areas. Tergite eight may be exposed or concealed (see Thompson 1992). In some groups with abbreviated elytra, one or two tergites are uncovered and usually sclerotized. The uncovered terminal tergites form the pygidium (Fig. 7D and 7E).

Male genitalia provide useful features to diagnose weevil taxa. The most important characters at higher level are the development and relative length of the aedeagus (Fig. 10C and 10F), the tegmen (with its *dorsal plate* and its apodeme or manubrium) (Fig. 10D and 10G), and the apodeme of the sternite nine (spiculum gastrale) (Fig. 10E and 10H), all of them forming the genitalic armature. Most Curculionidae have the "derived type of male genitalia", with the tegmen shorter than the aedeagus, the tegminal dorsal plate vestigial or absent, and the manubrium shorter than the spiculum gastrale (Fig. 10F to 10H). Other weevil families and some basal taxa of Curculionidae (e.g., Erirhininae) have the "primitive type of male genitalia", with the tegmen as long as to longer than the aedeagus, the tegminal dorsal plate well-developed, and the manubrium longer than the spiculum gastrale (Fig. 10C to 10E).

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3 broad and bilobed, outer view, *Ameris ynca* (Sahlberg) (Curculionidae, Molytinae, Cholini); (F) front tibia and tarsus, tibial apex with grooming device, tarsite 1 about as long as tarsites 2 + 3 combined, inner view, *Dicordylus annulifer* (Philippi) (Belidae, Belinae); (G)) front tibia and tarsus, tibial apex with grooming device, tarsite 1 shorter than tarsites 2 + 3 combined, inner view, *Hydnorobius hydnorae* (Pascoe) (Belidae, Oxycoryninae); (H) front tibia and tarsus, tibial grooming device consisting of a long comb of setae, inner view, *Cossonus fossatus* Boheman (Curculionidae, Cossoninae); (I) front tibia and tarsus, tibial grooming device consisting of a short apical comb of setae, inner view, *Cratosomus fasciatus* Perty (Curculionidae, Conoderinae); (J) tarsal claws free, simple, *Naupactus xanthographus* (Germar) (Curculionidae, Entiminae); (K) tarsal claws connate, *Chalcodermus serripes* Fahraeus (Curculionidae, Molytinae, Sternechini); (L) tarsal claws free, appendiculate or toothed, *Anthonomus* sp. (Curculionidae, Curculioninae, Anthonomini); (M) tarsal claws with dorsal and ventral lobes between them, *Mesocordylus cylindraceus* (Boheman) (Curculionidae, Dryophthorinae). Scale = 1 mm, except J, L and L = 0.1 mm.

Caracteres del ápice de las tibias, tarsos, y uñas tarsales: (A) tibia y tarso posteriores, ápice de la tibia con mucro, vista externa, *Platyaspistes argentinensis* Kuschel (Curculionidae, Entiminae) (B) tibia y tarso posteriores, ápice de la tibia con mucro y espolones, vista externa, *Listroderes costirostris* Schoenherr (Curculionidae, Rhythirininae); (C) tibia y tarso posteriores, ápice de la tibia con "uncus" (= gancho) , sin peine tibial, tarsito 3 no bilobado, vista externa, *Cossonus fossatus* Boheman (Curculionidae, Cossoninae); (D) tibia y tarso posteriores, ápice de la tibia con "uncus", los cinco tasitos conspicuos, subcilíndricos, tarsito 1 elongado; (E) tibia y tarso posteriores, ápice de la tibia con "uncus" y premucro, peine tibial presente, tarsito 3 ancho y bilobado, vista externa, *Ameris ynca* (Sahlberg) (Curculionidae, Molytinae, Cholini); (F) tibia y tarso anteriores, ápice de la tibia con dispositivo de limpieza, tarsito 1 casi tan largo como los tarsitos 2 + 3 combinados, vista interna, *Dicordylus annulifer* (Philippi) (Belidae, Belinae); (G) tibia y tarso anteriores, ápice de la tibia con dispositivo de limpieza, tarsito 1 más corto que los tarsitos 2 + 3 combinados, vista interna, *Hydnorobius hydnorae* (Pascoe) (Belidae, Oxycoryninae); (H) tibia y tarso anteriores, dispositivo de limpieza de la tibia, consistente en un peine de setas largas, vista interna, *Cossonus fossatus* Boheman (Curculionidae, Cossoninae); (I) tibia y tarso anteriores, dispositivo de limpieza de la tibia consistente en un peine apical de setas cortas, vista interna, *Cratosomus fasciatus* Perty (Curculionidae, Conoderinae); (J) uñas tarsales libres, simples, *Naupactus xanthographus* (Germar) (Curculionidae, Entiminae); (K) uñas tarsales unidas en la base, *Chalcodermus serripes* Fahraeus (Curculionidae, Molytinae, Sternechini); (L) uñas tarsales libres, apendiculadas o dentadas, *Anthonomus* sp. (Curculionidae, Curculioninae, Anthonomini); (M) uñas tarsales con lóbulos dorsal y ventral, *Mesocordylus cylindraceus* (Boheman) (Curculionidae, Dryophthorinae). Escala = 1 mm, excepto J, K y L = 0.1 mm.

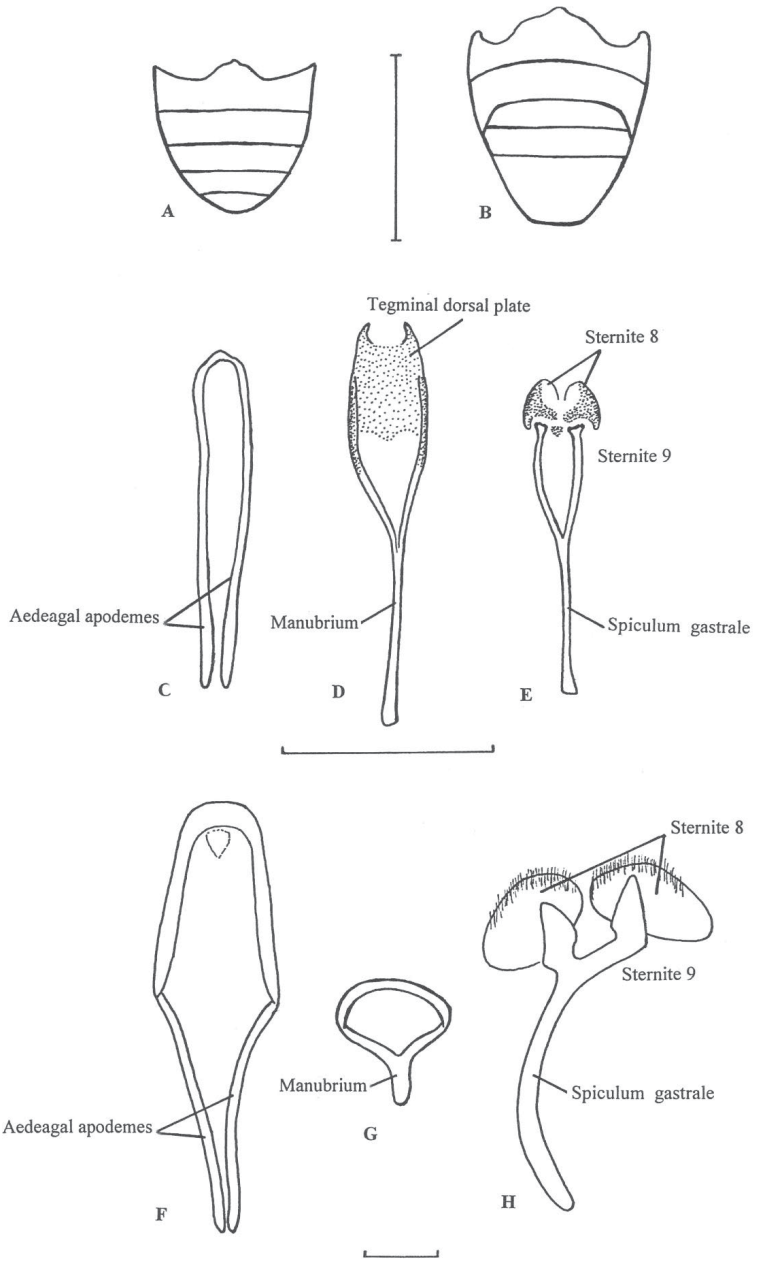

Fig. 10: Characters of abdomen and male genitalia: (A) Abdominal ventrites with straight sutures, *Anthonomus* sp. (Curculionidae, Curculioninae, Anthonomini); (B) abdominal ventrites, posterior suture of ventrite 2 posteriorly curved at sides, *Sibinia sellata* (Boheman) (Curculionidae, Tychiini); (C-E) male genitalia of the "primitive type", dorsal view: (C) aedeagus (Curculioninae details of endophallus not drawn), (D) tegmen, (E) sternites 8 and 9, *Neochetina bruchi* Hustache (Curculionidae, Erirhininae); (F-H) male genitalia of the "derived type", dorsal view: (F) aedeagus (details of endophallus not drawn), (G) tegmen, (H) sternites 8 and 9, *Heilipodus argentinicus* (Heller) (Curculionidae, Molytinae, Hylobiini). Scale = 1 mm.

Caracteres del abdomen y de la genitalia del macho: (A) Ventritos abdominales con suturas rectas, *Anthonomus* sp., (Curculionidae, Curculioninae, Anthonomini); (B) ventritos abdominales con la sutura posterior del ventrito 2 curvada posteriormente en los lados, *Sibinia sellata* (Boheman) (Curculionidae, Curculioninae, Tychiini); (C-E) genitalia del macho de "tipo primitivo", vista dorsal: (C) aedeago (detalles del endofalo no fueron ilustrados), (D) tegmen, (E) esternitos 8 y 9, *Neochetina bruchi* Hustache (Curculionidae, Erirhininae); (F-H) genitalia del macho de "tipo derivado", vista dorsal, (F) aedeago (detalles del endofalo no fueron ilustrados), (G) tegmen, (H) esternitos 8 y 9, *Heilipodus argentinicus* (Heller) (Curculionidae, Molytinae, Hylobiini). Escala = 1 mm.

Key to adult weevils of Curculionoidea

1. Antenna straight; club usually loosely articulated (Fig. 2A and 2B) 2
1'. Antenna geniculate; club compact (with fused articles) (Fig. 2 D and 2E) .... Curculionidae…10 [Exceptions are *Tachygonus* Guérin-Méneville (Curculioninae, Rhamphini) and *Trichodocerus* Chevrolat (Conoderinae), with antennae almost straight due to shortened scape, but with distinct compact club and large eyes subcontiguous on frons.]
2. Apex of rostrum with distinct labrum and clypeolabral suture (Fig. 4A). Maxillary palpus elongate, flexible, projecting antero-laterally (Fig. 4 C) 3
2'. Apex of rostrum lacking distinct labrum and clypeolabral suture (Fig. 4B). Maxillary palpus short, rigid, not projecting antero-laterally (as in Fig. 4D to 4F) 4
3. Rostrum usually subcylindrical and long. Prothorax without transverse and lateral carinae or sharp edges. Tibial spurs present. Pygidium covered by elytra. Larvae in male cones of conifers (Araucariaceae) or male flowers of Nothofagaceae ....Nemonychidae: Rhinorhynchinae
3'. Rostrum usually flattened, broad, and short to moderately elongate (Fig. 4A). Prothorax with lateral carinae, distinct at least near base, continuous with transverse (basal or pre-basal) carina (Fig. 7B). Tibial spurs absent or vestigial. Pygidium exposed, at least in males. Larvae fungus feeders, usually in dead wood or decaying plant tissues .....Anthribidae: Anthribinae
4. Apex of front tibiae with grooming device on inner face, consisting of shallow area densely clothed with fine vestiture (Fig. 9F and 9G). Gular sutures usually paired, bounding gula (Fig. 4G)..... Belidae…5
4'. Apex of front tibiae without such grooming area on inner face. Gula indistinct, with a single gular suture (as in Fig. 4E) 6
5. Antennae inserted some distance from base of rostrum (Fig. 2F); club indistinct or with terminal segments loosely articulated (Fig. 2A). Tarsite 2 of all legs quadrate or elongate, usually emarginate but not bilobate; tarsite 1 at least as long as tarsites 2+3 combined (Fig. 9F). Pronotum not laterally carinate. Larvae bore in dead or decaying branches or twigs..... Belinae
5'. Antennae inserted at base of rostrum; club distinct, with articles 10 and 11 fused (Fig. 2G). Tarsite 2 of all legs transversal, usually bilobate; tarsite 1 shorter than tarsites 2+3 combined (Fig. 9G). Pronotum laterally carinate. Larvae bore in reproductive parts of parasitic dicots or in cones of cycads or conifers (*Araucaria*) .... Oxycoryninae
6. Maxillary palpus usually four segmented, if only three segmented, then elytra irregularly punctuated [Body setose or pilose but without broad scales; cuticle often metallic or brightly coloured] ....Attelabidae…7
6'. Maxillary palpus two or three segmented (as in Fig. 4E). Elytra punctuate-striate (as in Fig. 1A) 8
7. Mandibles externally dentate (Fig. 4B). Tarsal claws free, appendiculate or toothed (as in Fig. 9L). Larvae in decaying flower buds or fruits .....Rhynchitinae
7'. Mandibles not externally dentate. Tarsal claws connate (as in Fig. 9K), simple. Larvae inside leaf-rolls made by adult female .....Attelabinae
8. Antennae inserted ventrally on rostrum (Fig. 2H). Ventrites 1-2 not fused, not stepped in lateral view (leveled with ventrites 3-5). Abdominal tergites 6 and 7 without spiracles. Larvae in female cones of Cupressaceae ..... CARIDAE: Carinae
8'. Antennae usually inserted laterally on rostrum (Fig. 6A and 6B). Ventrites 1-2 fused, stepped in lateral view (more convex and above level of ventrites 3-5) (Fig. 6A and 6B). Abdominal tergites 6 and 7 with spiracles .....Brentidae…9
9. Species usually large, with elongate body (Fig. 6A). Eyes with smooth surface, ommatidiae indistinct. Antennae usually composed of 11 free articles, the last three not forming a compact club (Fig. 6A). Legs with small, somewhat triangular trochanters; femur attached to side of trochanter, with its base closely adjacent to coxa (Fig. 6A and as in Fig. 8C). Larvae in dead or decaying wood, usually under bark with fungi. Taphroderini are predaceous

and behave as kleptoparasites of some Scolytinae and Platypodinae .... Brentinae

[Cyladinae, with *Cylas formicarius* introduced into Venezuela, would key out in this couplet, except for its antennae with nine free articles, and with articles 10-11forming a club, which is very elongate in males (Fig. 2C). This species feed on sweet potato tubers].

9'. Species usually small, with pyriform body (Fig. 6B). Eyes with faceted surface, ommatidiae distinct. Antennae usually with eight free articles and a compact club formed by articles 9 to 11 (Fig. 5A). Legs with large, somewhat subcylindrical trochanters; femur attached to apex of trochanter and with its base distant from coxa (Fig. 6B and 8D). Larvae develop inside stems or roots (sometimes forming galls), seeds or leaves ..... Apioninae

10. Rostrum vestigial (Fig. 3A and 6C). Head in ventral view with a subtriangular pregular sclerite, located between median gular suture and labial articulation (Fig. 4H). Prosternum equal to, or shorter than width of front coxa 11

10'. Rostrum present (Fig. 5A to 5H), various in length (short and broad to very long and subcylindrical). Head in ventral view, without pregular sclerite (Fig. 4D and 4E). Prosternum usually longer than width of front coxa 12

11. Head as wide as pronotum, visible in dorsal view (Fig. 5I). Pronotum usually with lateral constriction near middle (Fig. 5I). Antennal club without sutures (Figs. 3A and 5I). Tarsite 1 as long as, to longer than tarsites 2-5 combined (Fig. 9D). Aedeagus (dissection necessary) lacking apodemes. Wood borers feeding on ambrosia fungi that line their tunnels ..... Platypodinae

11'. Head narrower than pronotum, often concealed by pronotum in dorsal view (Fig. 5J). Pronotum without lateral constriction (Fig. 5J). Antennal club with sutures (Fig. 5J and 6C). Tarsite 1 shorter than tarsites 2-5 combined. Aedeagus (dissection necessary) with apodemes. Many species in galleries under bark (bark beetles) that form a feather pattern, others bore into the wood and live on ambrosia fungi which grow in their galleries ..... Scolytinae

12. Antennal club typically truncate-conical, with a shiny, glabrous, basal part and a spongy distal part; funicle with four to six articles (article seven fused with the club and forming the shiny basal part) (Fig. 2E); scrobe short, the scape in repose not fitting into it. Prementum concealed, not visible in ventral view of rostrum. Apex of tarsite 5 with dorsal and ventral lobes extended between claws (Fig. 9M). Many species develop in decaying tissues (stems, roots) of monocots (mainly grasses and palms), others in rotten wood, or in seeds and stored grains ..... Dryophthorinae

12'. Antennal club usually ovoid, pilose, and having distinct sutures; funicle usually with seven articles (Fig. 1A and 2D); scrobe usually elongate, the scape in repose fitting into it (Fig. 1C). Prementum exposed, visible in ventral view of rostrum (Fig. 4D and 4E). Tarsal lobes between claws absent (Fig. 9J to 9L) 13

13. Body densely covered with broad scales, forming waterproof vestiture, usually with varnish-like coating. Male genitalia (dissection necessary) (Fig. 10C to 10E): tegmen (Fig. 10D) about as long as, to longer than aedeagus (including apodemes) (Fig. 10C); *manubrium* (apodeme of tegmen) (Fig. 10D) longer than *spiculum gastrale* (apodeme of sternite 9) (Fig. 10E); dorsal plate of tegmen usually well-developed, bilobed and sometimes apically pilose (Fig. 10D). [These genitalic characters are not present in several Stenopelmini (G. Wibmer, pers. comm.)]. Aquatic or semiaquatic species. Larvae in stems, roots or leaves of aquatic or semiaquatic plants (mostly monocots and ferns) ..... Erirhininae

13'. Body covered with scales or setae of different shapes and densities, or lacking scales; if dense vestiture present, then without varnish-like coating. Male genitalia (Fig. 10F to 10H) (dissection necessary): tegmen (Fig. 10G) shorter than aedeagus (Fig. 10F); m*anubrium* (Fig. 10G) shorter than *spiculum gastrale* (Fig. 10H); dorsal plate of tegmen vestigial or absent (Fig. 10G). Mostly terrestrial species 14

14. Rostrum broad, and shorter than head; both resting in a deep cavity located anterior to

front coxae, and formed by sides of prothorax and posteriorly limited by a small, subtriangular plate of prosternum. All tarsites subcylindrical. Larvae root feeders ..... Thecesterninae

14'. Rostrum usually longer than head, not resting in a cavity (as in Fig. 1B). If prosternal channel present, only receiving rostrum (as in Fig. 3F and 3G). Tarsite 3 usually bilobate (as in Fig. 1B) 15

15. Front tibiae with grooming device consisting of a long comb of setae, on apical 1/3-1/2 (Fig. 9H). Hind tibiae lacking apical comb of setae (Fig. 9C). Tarsite 3 as wide as tarsite 2 (Fig. 9C and 9H). [Body elongate, parallel-sided, depressed; rostrum often shorter than prothorax; all legs with uncinate tibiae (Fig. 9C), except in Araucariini]. Borers in dead or dying wood or woody tissues. Habits of the Araucariini are similar to those of Scolytinae, since both, adult and larvae, tunnel under bark, often in branches also occupied by scolytines .... Cossoninae

15'. Front tibiae with grooming device on outer face consisting of short comb of setae, near tarsal articulation (Fig. 9I). Hind tibiae with apical comb of setae present (e.g., Fig. 9A, 9B and 9E). Tarsite 3 usually wider than tarsite 2 (Fig. 9E and 9I) 16

16. Mesepimeron strongly ascending (Fig. 7E), often visible from dorsal view between base of pronotum and elytra [In some Conoderinae the mesepimeron is only slightly ascending, but they can be recognized by their eyes usually large and subcontiguous towards top front of head (Fig. 5 F), and by their uncinate tibiae] .. 17

16'. Mesepimeron not ascending (as in Fig. 7 F), and not visible from dorsal view 19

17. Eyes usually large and dorsally subcontiguous, separated by a narrow frons (Fig. 5F), if not subcontiguous, then with their lower margin above dorsum of rostral base (Fig. 3F). Prosternal channel to receive rostrum in repose, present (Fig. 3F).Hind tibia with well-developed uncus. Larvae borers in living or dead wood or stems .... Conoderinae (= Zygopinae)

17'. Eyes small to moderate, dorsally separated by a broad frons, and with their lower margin below dorsum of rostral base (Fig. 5C). Prosternal channel present or absent. Hind tibia with or without well-develped uncus 18

18. Body vestiture usually shining, with few or no scales. Postocular lobes usually absent (Fig. 5C and 7E). Hind tibiae often with well-developed uncus. Pygidium covered by elytra or exposed (Fig. 7E). Larvae borers in flowers, petioles, stems, and roots of herbaceous dicots, some in palm fruits, grasses and other monocots ..... Baridinae

18'. Body vestiture usually not shining, with scales. Postocular lobes frequently present and partially covering the eye (Fig. 5D). Hind tibiae with rudimentary uncus or lacking uncus. Pygidium exposed, not covered by elytra. Larvae borers in stems or crowns of herbaceous plants; some feeding on leaves of aquatic plants .... Curculioninae- Ceutorhynchini

19. Prothorax longer than wide, narrowed at base and then widened (Fig. 7A). Species usually mimic of ants. Larvae stem-borers of dicots, sometimes in galls; some erodiscines associated to aquatic monocots Curculioninae ..... . Otidocephalini (= Myrmecini), Erodiscini

19'. Prothorax usually wider than long, various in shape (Fig. 6D to 6G) 20

20. Front or hind femora with particular features, markedly different from those of other legs (Fig. 8E and 8F). Antennae either geniculate (Fig. 8E), or curved but not functionally geniculate (with scape very short, not or only slightly exceeding length of funicular article 1) 21

20'. Front and hind femora without particular features, rather similar in all legs. Antennae geniculate (with scape distinctly longer than funicular article 1) 22

21. Front femora with a large triangular "tooth", often serrate on anterior margin; middle and hind femora of similar size (Fig. 8E). Larvae leaf-miners of dicots ....Curculioninae-Camarotini, Ceratopodini, Piazorhinini, Prionobrachiini

21'. Front femora without large triangular tooth; hind femora distinctly stouter and/or longer than middle femora (jumping forms) (Fig. 8F). Larvae leaf-miners of dicots..... ..... Curculioninae -Rhamphini (=Tachygonini)

22. Tibiae either apically unarmed, or mucronate (Fig. 9A), or with uncus present on front and middle tibiae but absent or very rudimentary (smaller than tarsal claw) on hind tibiae. Apical comb of setae oriented transversely to tibial axis (Fig. 9A and 9B). Rostrum various in length (Fig. 5G and 5H) 23

22'. All tibiae with well-developed uncus (a premucro can also be present) (Fig. 9E). Apical comb of setae usually oriented obliquely or subparallel to tibial axis (Fig. 9 D). Rostrum usually elongate (e.g., Fig. 3C, 3D and 5H) 33

23. Head relatively large, not subspherical; rostrum usually robust, broad and short; antennal scape usually passing anterior margin of eye (Fig. 3B). Eyes various in size, usually facing outwards; width of frons greater than width of eye (Fig. 5G). Adelognathous (Fig. 4D) or phanerognathous (Fig. 4E). Tibial spurs present (Fig. 9B) or absent 24
[This group of weevils is informally known as "broad-nosed weevils"]

23'. Head relatively small, subspherical; rostrum usually elongate; antennal scape usually not passing anterior margin of eye (Fig. 3C). Eyes usually large, placed anteriad; width of frons narrower than width of eye (Fig. 5H). Phanerognathous (Fig. 4E). Tibial spurs absent 28

24. Mandibles relatively large, with apical scar (sometimes raised) left by deciduous process (Fig. 4D); dorsal surface of mandibles with setae and/or scales (usually 3 to 5 large setae); if scar inconspicuous, then dorsal surface densely squamose or setose. Adelognathous (maxillae covered by large prementum) (Fig. 4D); if phanerognathous (as in Fig. 4E), then mandible with scar or deciduous process, or densely squamose or setose. Larvae of most species live in soil, feeding externally on roots; adults usually eat leaves .... Entiminae
[Entiminae includes the genera traditionally placed in "Leptopiinae" [junior synonym of Entiminae], "Brachyderinae", and "Otiorhynchinae" (see Wibmer & O'Brien, 1986). "Leptopiinae" are distinguished by the presence of postocular lobes on anterolateral margins of pronotum (as in Fig. 3E). "Brachyderinae" and "Otiorhynchinae" lack postocular lobes, and differentiate because in "Brachyderinae" the antennal scrobes are lateral and ventrally bent (the scape in repose passes below eye) (Fig. 3B), whereas in "Otiorhynchinae" the antennal scrobes are dorsal and visible from above (the scape in repose usually passes over the middle of the eye].

24'. Mandible relatively small, without scar or deciduous process; dorsal surface usually glabrous, or with few setae. Phanerognathous (maxillae exposed at sides of prementum) (Fig. 4E) 25

25. Antennal scrobes extended towards venter of rostrum (Fig. 3D). Head usually markedly prolonged behind eyes, if not very prolonged (e.g., *Omoides* Boheman) then funicle 6-articulated (Fig. 3D). Eyes very prominent (Fig. 3D). Larvae in various living or decaying plant tissues; adults pollen feeders ..... Eugnominae

25'. Antennal scrobes lateral, not extended towards venter of rostrum (Fig. 3E). Head not markedly prolonged behind eyes (Fig. 3E). Eyes variable 26

26. Postocular lobes usually present (Fig. 3E) (except in *Falklandius* Enderlein, *Antarctobius* Fairmaire, and *Haversiella* Schweiger). Metasternum often shorter than ventrite 1, at midline. Rostrum various in shape and length. Larvae ecto- and endophytic on diverse herbaceous plants and plant organs ..... Rhythirininae

26'. Postocular lobes usually absent. Metasternum often about as long as ventrite 1, at midline. Rostrum stout, often short, subquadrate in cross section. 27

27. Body broad, pronotum plus elytra rhomboidal in dorsal view, not tuberculate (Fig. 6D). Frons without raised supraocular area. Larvae and adults ectophytic on leaves of *Eucalyptus* trees .... Gonipterinae
[Both species of *Gonipterus, G. gibberus* Boisduval and *G. scutellatus* Gyllenhal, have been introduced into South America from the Australian region. They occur in Argentina, Uruguay, and Brazil, and the presence of *G. scutellatus* has also been reported in Chile].

27'. Body elongate, pronotum and elytra often oval or parallel-sided in dorsal view, and frequently tuberculate (Fig. 6E). Frons usually with raised supraocular areas (superciliar arcs present). Larvae borers in roots or green wood ..... Aterpinae

28. Eyes transversely oval (transversal diameter greater than antero-posterior diameter) (Fig. 5E). Rostrum rather robust (Fig. 5E), and densely and uniformly setose. Vestiture (see mainly thoracic sterna and dorsum) with at least some scales truncated and bifid or multifid at apex. Larvae ectophytic on leaves of dicots, construct loosely cocoons for pupation, attached to host-plants .... Hyperinae

28'. Eyes rounded (Fig. 5H) or longitudinally oval (Fig. 3C). Rostrum usually elongate (Fig. 3C and 5H), lacking setae or with sparse setae, not uniformly distributed. Vestiture with scales variable in shape but not bifid. Larvae endophytic in a variety of niches, in living plant tissues: stem-borers, leaf-miners, in flower buds, fruits or seeds. Mostly associated with dicots, but some derelomines develop in reproductive structures of gymnosperms and palms .... Curculioninae (majority of tribes)…29

29. Eyes latero-ventral, close to each other in ventral view of head. Prosternal channel present. Tarsal claws connate at base (as in Fig. 9K) ..... Smicronychini

29'. Eyes lateral, separate in ventral view of head. Prosternal channel absent. Tarsal claws free, separate at base (as in Fig. 9J and 9L) 30

30. Mandibular motion vertical. Rostrum usually very long and very slender. Tarsal claws appendiculate (with a basal process or tooth) (as in Fig. 9L) ..... Curculionini

30'. Mandibular motion horizontal. Rostrum usually elongate but variable in shape. Tarsal claws simple (as in Fig. 9J) or appendiculate (as in Fig. 9L) 31

[Pyropini and Mecinini (= Gymnetrini) would key out here. The former, with genus *Craspedotus* Schoenherr from Bolivia and Brasil, can be distinguished by the thin lateral carina separating the pronotum from the pleuron of the prothorax; the latter, with genus *Gymnetrum* Schoenherr introduced in Brasil, can be recognized by the antennal funicle five-articulated]

31. Posterior margin of ventrite 2 posteriorly curved at sides (Fig. 10B). Pronotal scales directed mesad. Rostrum rather robust and often tapered apically ..... Tychiini

31'. Ventrites with straight sutures (Fig. 10A) [If posterior margin of ventrite 2 curved, then rostrum shorter than pronotum]. Pronotal scales not directed mesad, usually anteriad. Rostrum variable 32

32. Eyes very prominent on outline of head (Fig. 5H). Rostrum cylindrical .... Anthonomini

32'. Eyes not prominent. Rostrum variable, sometimes dorsoventrally compressed and / or expanded laterally at apex .... Derelomini

33. Sternal channel present with a cup-like receptacle at its end (often at mesosternum) (Fig. 3G). The channel usually extended along prosternum and mesoternum, but in some species it can reach the metasternum and even the apex of ventrite 5 (female of *Panolcus* Gerstaecker)]. Larvae endophytic in living or decaying plant tissues .... Cryptorhynchinae

33'. Sternal channel absent (Fig. 8B); if prosternal channel present, without cup-like mesosternal receptacle (Fig. 8A) 34

34. Elytral base (at intervals 2-4) extended forward, covering base of pronotum (Fig. 7D). Pygidium exposed (Fig. 7D). Larvae borers in dead or dying branches .... Mesoptiliinae (= Magdalidinae)

34'. Elytral base not extended forward, pronotal base exposed (as in Fig. 6D to 6G). Pygidium covered by elytra (as in Fig. 6D to 6G) 35

35. Tarsal claws often connate at base (as in Fig. 9K). Metepimeron exposed (with vestiture of scales and punctures same as metepisternum) (Fig. 7F). Labial palpi one-segmented in appearance (because articles are short and telescoping) (Fig. 4F). Body shape usually slender and elongate (Fig. 7F). Larvae mostly root feeders; some develop in flower buds or stems .... Lixinae

35'. Tarsal claws frequently separate, free (as in Fig. 9J). Metepimeron covered by elytra (vestiture seen after dissection, composed

of scales and punctures finer than those of metepisternum) (Fig. 1C). Labial palpi 3-segmented (Fig. 4E). Larvae endophytic in a variety of niches, usually in living or decaying tissues of woody plants, some (e.g., Cholini) borers in stems of monocots, others (e.g., Conotrachelini) inside fruits and nuts of dicots ..... Molytinae (various tribes)……36

36. Front coxae contiguous (Fig. 1B) or subcontiguous, separate by less than 1/2 of coxal width (Fig. 8A) 37
[Lymantini, Cycloterini, and Phrynixini would key out here. The first tribe (see Kuschel in Wibmer & O'Brien 1986: 179) is represented in Brazil, Bolivia, Colombia, Ecuador, and Venezuela; the other two tribes occur only in Chile, where they were assigned a single species].

36'. Front coxae separated by at least 1/2 of coxal width (Fig. 8B) 40

37. Tarsal claws connate (Fig. 9K), if free (*Antilophus* Kuschel), then front femur very robust and with large tooth ..... Sternechini, Pacholenini

37'. Tarsal claws free (= separate) (as in Figs. 9J or 9L) 38

38. Prosternal channel present (Fig. 8A). Front tibiae usually not compressed and bisinuate on inner margin ..... Cleogonini, Conotrachelini
[Nettarhinini and Guioperini, previously classified in Cryptorhynchinae (see Kuschel in Wibmer & O'Brien 1986: 183) would key out in this couplet. They are represented in Brazil, Colombia and Venezuela, with the latter also occurring in Bolivia, French Guiana, Guyana, Peru, and Trinidad].

38'. Prosternal channel absent (Fig. 1B and 8B). Front tibiae compressed and bisinuate on inner margin 39
[Anchonini and Lithinini, traditionally assigned to "Hylobiinae", would key out in this couplet. They are characterized by the tuberculate, granulate or carinate elytra (mostly smooth in other tribes). In addition, Lithinini (*Oncorhinus* Schoenherr) is distinguished by the basally angulate rostrum (Costa Lima 1956: Fig. 95). Both tribes are represented in Bolivia, Colombia, Ecuador, French Guiana, and Peru; the former also in Venezuela and Galapagos Islands; the lattter also in Brazil and Paraguay.]

39. Antennal insertion visible in dorsal view of rostrum (Fig. 1A). Femora usually dentate on inner margin (Fig. 1A and 1B) ..... Hylobiini

39'. Antennal insertion not visible in dorsal view of rostrum. Femora unarmed Pissodini
[Pissodini is introduced into South America, with *Pissodes castaneus* (De Geer) in Argentina, and *P. radiatae* Hopkins in Uruguay and Brazil].

40. Body form (pronotum plus elytra in dorsal view) subrhomboidal (Fig. 6 F). Elytral stria 3 joining stria 8 (as in Fig. 1A). Hind tibiae with uncus (outer tooth) and premucro (inner tooth), both large (Fig. 9E) ..... Cholini

40'. Body form elongate- oval to broadly-oval (Fig. 6G). Elytral stria 3 joining stria 6 (Fig. 7G). Hind tibiae uncinate, or with uncus and very small premucro ..... Amalactini, Petalochilini
[Trypetidini and Juanorhinini would key out in this couplet. The former is represented in Bolivia, Brazil, Colombia, Ecuador, French Guiana, Juan Fernández Island, and Peru; the latter is endemic to Juan Fernández Island. The former is easily distinguished by the very depressed body, with pro- and mesosternum on the same level (Kuschel 1952)]

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