LARVAE OF SOUTH AMERICAN ENTIMINI (COLEOPTERA: CURCULIONIDAE), AND PHYLOGENETIC IMPLICATIONS OF CERTAIN CHARACTERS

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ABSTRACT

Larvae of 16 species of Entimini are described and illustrated, 10 of them for the first time. Larval descriptions or redescriptions are given for the South American genera: Cylydrorhinus Guérin, Entimus Germar, Malvinius Kuschel, Pororhynchus Schoenherr, Naupactus Dejean, and Platyaspistes Schoenherr. Larvae of species assigned to Naupactus and allied genera (Asynonychus Crotch, Atrichonotus Buchanan, and Eurymetopus Schoenherr) do not show differences at generic level. The larvae herein studied are compared with those known from other regions, and the taxonomic or phylogenetic implications of certain characters are discussed.

Key words: Curculionidae, Entimini, larvae, morphology, systematics.

RESUMEN

Larvas de 16 especies de Entimini son descriptas e ilustradas, 10 de ellas por primera vez. Descripciones o redescripciones larvales se brindan para los géneros sudamericanos: *Cylydrorhinus* Guérin, *Entimus* Germar, *Malvinius* Kuschel, *Pororhynchus* Schoenherr, *Naupactus* Dejean y *Platyaspistes* Schoenherr. Larvas de especies asignadas a *Naupactus* y géneros afines (*Asynonychus* Crotch, *Atrichonotus* Buchanan y *Eurymetopus* Schoenherr) no presentan diferencias a nivel genérico. Las larvas tratadas aquí son comparadas con las conocidas de otras regiones y se discuten las implicancias taxonómicas o filogenéticas de ciertos caracteres. Palabras claves: Curculionidae, Entimini, larvas, morfología, sistemática.

INTRODUCTION

The Entimini, as defined by Marvaldi (1997, 1998b), are the largest tribe of the subfamily Entiminae, comprising about 1115 genera and 11572 weevil species, distributed in all biogeographic regions of the World (Thompson, 1992).

Over a hundred species representative worldwide of about 70 genera belonging to Entimini have been described at the larval stage by Emden (1952), May (1977, 1993, 1994), Rosenstiel (1987), and Lee & Morimoto (1988), among others. These references deal mainly with taxa from the Palearctic,

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Nearctic, or Australian regions. Contributions to weevil systematics based on larvae of South American taxa have been contrastingly few and sporadic, despite the high diversity of Entimini present in this region (Wibmer & O'Brien, 1986). Larvae of some species that occur in Argentina have been recently described and/or keyed by Loiácono & Díaz (1992, 1995), Marvaldi & Loiácono (1994), Lanteri & Marvaldi (1995), and Lanteri et al. (1997). In relation with some recent phylogenetic studies (Marvaldi, 1997, 1998b) larvae of 16 entimine species native to South America became available. These species fall into Marvaldi's (1998b) larval groups "B" and "C", while South American representatives of larval group "A" are not available for study (but see Emden (1952) for larval descriptions of some Palearctic species of Polydrusus Germar). Larvae herein treated of Cylydrorhinus Guérin, Entimus Germar, Malvinius Kuschel, and Pororhynchus Schoenherr fit into group B, whereas those of Naupactus Dejean and Platyaspistes Schoenherr fit into group C. In this paper I present detail descriptions and illustrations of these larvae, compare them with those known from other regions, and discuss the taxonomic or phylogenetic significance of some larval characters.

MATERIALS AND METHODS

The present study is based on the examination of larvae obtained by personal collectings and rearing procedures in Argentina during 1991-1995. This larval material, together with the adult voucher specimens, are hold at the collection of A. E. Marvaldi [AEM] currently at the Instituto Argentino de Investigaciones de Zonas Áridas, Mendoza, Argentina. Other specimens studied were borrowed from the following institutions: Museo Argentino de Ciencias Naturales, Buenos Aires, Argentina [MACN]; Museo de La Plata, La Plata, Argentina [MLP]; The Natural History Museum, London, England [NHM], and National Museum of Natural History, Washington D. C., USA [NMNH].

Rearing. Couples of adult weevils or single parthenogenetic females were kept in jars. Each rearing jar contained: a disc of tissue paper on its bottom; a small plastic vial with water, bearing twigs and leaves of the host plant inserted across its cap; and a fine net covering a window of the jar cap for aeration. Folded pieces of tissue paper were provided to facilitate oviposition, following Emden (1950), because most species use to lay eggs between two adjoining surfaces. When oviposition in soil was suspected, a small container with soil was also provided. The eggs were transferred to plastic vials on damp tissue paper until eclosion of first instar larvae. Mature larvae were obtained by direct collection in the field or from submature larvae reared in plastic vials with dampened soil and roots to feed the larvae. The roots were taken from host plants or from small plants of lucerne (Medicago sativa) or clover (Trifolium sp.) planted in the pot. To feed larvae of large species (more than 10 mm long) a small potato (Solanum tuberosum) tubercle was provided.

The techniques for preservation, dissection, and illustration of larvae follow May (1977, 1979). The external morphology of weevil larvae and terminology used for systematic purposes are described and illustrated in Marvaldi (in press). The terminology used in this study generally follows, with few alterations, Anderson (1947) and Rosenstiel (1987).

This systematic study was based on examination of both last and first instar larvae if available. For several species, however, only one instar was obtained. Except for *Naupactus*, a single representative species of each genus was available, but descriptions at generic and specific levels were intended taking into account the characters of *Naupactus* and published information on other entimine larvae. Thus, the present diagnostic status of some characters may not be retained in the future, after larvae of more species become known.

Abbreviations used in text and figures: AI-X= abdominal segments; ams = anteromedian setae; as= alar setae; cls= clypeal setae; des= dorsal epicranial setae; dms= dorsal malar setae; ds= dorsal setae; fs= frontal setae; lms= labral setae; les= lateral epicranial setae; mds= mandibular setae; mes= median epipharyngeal setae; pds= postdorsal setae; pes= posterior epicranial setae; pms= postmentum setae; prs= prodorsal setae; ss= spiracular setae; TI-III= thoracic segments pro-, meso-, and metathorax; vcs= ventral cranial setae; vms= ventral malar setae. The setae of the pedal areas (see Fig. 77) are labeled t - z following Emden (1952: 658). Setae x', y' and v' are additional microsetae placed close to the primary x, y and v respectively.

RESULTS

Cylydrorhinus Guérin

Larva I. Cuticle with spiniform asperities. Head (Figs. 1, 3) exposed, as wide as long. Frontal lines visible in their entire length. Endocarina hardly distinct. Hypopharyngeal bracon with paramedian maculae. Postoccipital condyles conspicuous. Setae: fs4,5 long, other fs minute; des1,2,3,5 long, des4 minute; les1,2 long; vcs1 well developed, vcs2 minute. Stemmata slightly distinct. Antennal sensorium (Figs. 1, 2) about 2 x wider than long, with subparallel sides and truncate apex. Clypeus (Fig. 4) pigmented at base; cls1,2 subequal and well developed. Labrum (Fig. 4) with Imsla little more separated than lms2, lms3 well developed but shorter than lms1,2; lateral sensilla located between lms1 and lms2; labral rods (Fig. 5) short. Epipharynx (Fig. 5) with mes1 separated by about same distance than mes2; sensillum clusters between mes1 and mes2;



Figuras 1 - 5: *Cylydrorhinus farinosus*, larva I. 1, head, dorsal; 2, antenna; 3, head, ventral; 4, clypeus and labrum; 5, epipharynx. Scales = 0.1 mm, except 2 = 0.05 mm.

ams1,2 subequal. Mandibles (Fig. 6) with mds1 long, mds2 minute and contiguous to mds1. Maxillae (Figs. 7, 8) with dms8 shorter than the other dms, intermediate vms well developed, though shorter than the other vms. Premental sclerite (Fig. 7) with posterior extension rounded at apex. **Tho**rax (Fig. 9). Spiracle (Fig. 12a) circular, with two airtubes very conspicuous, long and multiannulated. Pronotum with 9 setae, all well developed; epipleurum with 2 setae. TII,III with pds1,3,4 long, pds2 short and close to pds3 which is the longest; alar area with 2 as. Pedal area with x', y' sometimes discernible, u not very much smaller than v, seta z absent. Abdomen (Figs. 10, 11). Spiracles (Figs. 12b,c) similar to thoracic one, but with airtubes having less number of rings and posteriorly directed. AI-VII with pds3,5 longer than others, pds1 longer than pds2,4. AV-VIII with ss2 shifted to postdorsum. AVIII with 4 pds, lacking the homologous pds2 of preceding segments. Abdominal apex not modified. AIX with 3 ds, ds1 shorter than the others, ds2 long and less separated than ds1,3; pleura with 2-3 setae. AX terminal, subcircular, ventral anal lobe narrower than the others; each lateral anal lobe with 3 setae, the exterior strong.



Figures. 6 - 12: *Cylydrorhinus farinosus*, larva 1. 6, mandible, dorsal; 7, maxilla and labium, ventral; 8, maxilla, dorsal; 9, TI-III, AI, lateral; 10, AIV, lateral; 11, AVII-X, lateral; 12, spiracles (a, thorax; b, AIV; c, AVIII). Scales, 9 - 11 = 0.5 mm; 6-8, 12 = 0.1 mm.

Cylydrorhinus farinosus (Burmeister) (Figs. 1-12)

Larva I. Average dimensions (n = 10): body length 2.7 mm; head width 0.5 mm. Body yellowwhite with brown spiracles; head capsule brown, darker on anterior margin, each epicranial area with a palid band from des3 to des1; mandibles and stemmata brown. Setae translucid. Head (Fig. 1) subcircular. Epicranial line 0.6 x the length of head capsule. Setae: fs5 slightly longer than fs4 and des2 slightly shorter than des1. Thorax. Spiracle (Fig. 12a) with ventral airtube 12-annulated and dorsal airtube 10-annulated; distal rings dilated. Abdomen. Spiracles of AI-VII (Fig. 12b) with ventral airtube 5-annulated and dorsal airtube 4-annulated; spiracle of AVIII (Fig. 12c) with ventral airtube 8annulated and dorsal airtube 5-annulated; distal rings dilated.

Specimens examined. Argentina. Several larvae I obtained from two adult couples collected in Mendoza, San Rafael, Embalse El Nihuil, 6-III-94, host plant *Senecio subulatus* (Asteraceae). A. E. Marvaldi coll. det. [AEM].

Entimus Germar

Mature larva. Body very robust, with strongly convex dorsal folds and lateral areas (Fig. 22); thoracic segments narrower towards the head which is relatively small. Cuticle with very small spiniform asperities. Head (Fig. 13) exposed, a little longer than wide. Frontal lines visible in their entire length, proximally more distinct. Endocarina conspicuous, more than 0.5 x the length of frons. Hypopharyngeal bracon without maculae. Postoccipital condyles hardly distinct. Setae: fs4,5'long, other fs not visible; des1,2,3,5 long, subequal, des4 minute; pes not discernible; les1,2 long, subequal; only vcs1 discernible. Stemmata absent. Antennae (Fig. 14) relatively small; sensorium about 2 x wider than long, with sides slightly convergent towards subtruncate apex. Clypeus (Fig. 15) pigmented in a narrow basal band; cls1,2 very small and subequal. Labrum (Fig. 15) with lms1 a little less separated than lms2; lms3 well developed but shorter than lms1,2; lateral sensilla close to internal side of lms2; labral rods (Fig. 16) subparallel, widened at apex. Epipharynx (Fig. 16) with mes I separated by same distance than mes2; sensillum clusters between mes1 and mes2. Mandibles (Fig. 17) with mds1 distinct on the scrobe, mds2 vestigial and distally far from dms1. Maxillae (Figs. 18 - 20) with dms8 smaller than others: both intermediate vms minute. Premental sclerite (Fig. 18) broad, with anterior extension very short; posterior extension broadly united with lateral extensions and rounded at apex. Thorax (Fig. 21). Spiracle large, elliptical, with sclerotized broad peritreme, without airtubes. Pronotum with 8 setae; epipleurum with 2 unequal setae. TII, III with pds3 longer than the others and close to pds2; alar area with 2 as. Pedal area with a minute seta z discernible in TI. Abdomen (Figs. 22, 23). Spiracles similar to thoracic one. AI-VIII with both ss1,2 in the spiracular area. AVIII with prs shorter than in preceding segments, and with 3 pds, apparently lacking the homologous pds1,4 of preceding segments. AIX with 3 ds; ds1 very small, on the basal third of dorsum; ds2 slightly longer and less separated than ds3; setae of pleurum unequal. AX terminal, subcircular, 1 small setae on each lateral anal lobe, ventral lobe narrow.

Larva I (according to Bruch, 1932). Body hardly curved, cylindrical, tapering. Setae pale, very long, as long as the body width and even longer in the posterior part. Abdominal apex bilobed forming a pygopod.

Entimus sastrei Viana (Figs. 13-23)

Mature larva. Maximum dimensions (probably female specimen): body length 46.6 mm; head width 5.0 mm. Body creamy-white, with strongly convex dorsal folds, epipleura, and pleura. Setae inconspicuous and cuticle with minute asperities. Head testaceous, red-brown on anterior margin, and each epicranial area with a brownish streak behind *des2*. Labrum (Fig. 15) with 2 triangular pigmented figures that almost reach anterior margin. Thorax and abdomen. Pronotum palidly pigmented, setae weak.

Specimens examined. Argentina. (Data quoted verbatim): "Material típico Rev. Entom. S. Paulo", C. Bruch coll., 2 larvae [MACN].



Figures 13 - 20: *Entimus sastrei*, mature larva. 13, head, dorsal; 14, antenna; 15, clypeus and labrum; 16, epipharynx; 17, mandible, dorsal; 18, maxilla and labium, ventral; 19, mala, ventral; 20, maxilla, dorsal. Scales = 1 mm, except 14, 19 = 0.1 mm.



Figures 21 - 23: *Entimus sastrei*, mature larva. 21, TI,II, lateral; 22, AIV, lateral; 23, AIX,X, caudal. Scale = 5 mm.

Malvinius Kuschel

Mature Iarva. Body of modal form. Cuticle with small spiniform asperities, widely distributed. Head (Figs. 24, 26) exposed, subcircular. Frontal lines visible in their entire length. Endocarina absent. Hypopharyngeal bracon with paramedian maculae. Postoccipital condyles subtriangular, conspicuous. Setae: fs1,2,3 and des4 vestigial, even smaller than pes; vcs1 of medium length and vcs2 vestigial; other cephalic setae well developed. Stemmata absent. Antennal sensorium (Figs. 24, 25) about 2 x wider than long, with curved sides and truncate apex. Clypeus (Fig. 27) pigmented at base, cls1,2 minute. Labrum (Fig. 27) with lms1 longer and a little more separated than lms2; lms3 about about as long as lms2; lateral sensilla between lms1 and lms2; labral rods (Fig. 28) elongated, slightly convergent towards base. Epipharynx (Fig. 28) with mes1 separated by same distance than mes2; sensillum clusters between mesl and mes2. Mandibles (Fig. 29) with mds1 well developed, mds2 minute and contiguous to mds1. Maxillae (Figs. 30, 31) with dms8 shorter than others; one intermediate vms thicker than the other. Premental sclerite (Fig. 30) with posterior extension parallel sided. Thorax. Spiracle circular, with airtubes absent (full-grown larva) or vestigial. Pronotum with 9-11 setae; epipleurum with 2-3 setae. TII, III with pds2 short and located anterior to other pds, pds1 moderately long and pds3,4 long; alar area with 2 as. Pedal area with setae t, u, x, y of medium length, subequal; seta v long though shorter than w; seta zabsent or vestigial and represented by a sensillum with a central mark; setae x', y' minute but discernible, sensilla between v and w present Abdomen. Spiracles similar to thoracic one. AI-VII with pds1,3,5 long, pds2,4 short; both ss1,2 present in the spiracular area, but ss2 closer to postdorsum in AV-VII. AVIII with 4 pds; only ss1 in the spiracular area, ss2 absent. Abdominal apex not modified. AIX with 3 ds rather close to each other; ds1 shorter than ds2,3, ds2 long and less separated than ds1,3; ds3 more separated than ds1; both pleural setae conspicuous, the dorsal one shorter. AX terminal, subcircular; 3 conspicuous setae on each lateral anal lobe, the median one larger; ventral lobe narrower than dorsal lobe.

Malvinius compressiventris (Enderlein) (Figs. 24-31)

Mature larva. Maximum dimensions: body length 13.3 mm; head width 1.7 mm. Body whitish-yellow, with convex dorsal folds, epipleura and pleura. Setae orange-brown and cuticle with minute asperities. Head bright, orange-brown, darker on anterior margin. Epicranial and frontal lines yellow. Thorax and abdomen. Pronotum with setae 1,4 weak; a narrow band, pigmented as head capsule, present on the anterior pronotal margin behind setae 1,4. Spiracles with airtubes absent or only 2-3annulated and hardly projected beyond outer border of peritreme.

Specimens examined. Argentina. Malvinas Islands. (Data quoted verbatim): "W. Falklands, Chartres, 10-1986, B. M. 1987-12", R. T. Thompson det. by associated adults (1987), 4 larvae [NHM]; "Falklands Islands, A. G. Bennet, 16-VIII-35, 1935-397", 6 larvae [NHM]; "Falklands Islands, Chartres, Via 6, Murdoch Maff, registered corres. Feb. 1981, B. M. 1981-90", J. E. Marshall det. (1981), 4 larvae [NHM].



Figures 24 - 31: *Malvinius compressiventris*, mature larva. 24, head, dorsal; 25, antenna; 26, head, ventral; 27, clypeus and labrum; 28, epipharynx; 29, mandible, dorsal; 30, maxilla and labium, ventral; 31, maxilla, dorsal. Scales = 0.5 mm.

Pororhynchus Schoenherr

Larva I. Cuticle without asperities. Head (Fig. 32) as wide as long, subquadrant. Frontal lines visible in their entire length. Endocarina conspicuous, about 0.5×10^{-5} km length of frons. Setae: *fs4* longer

than *fs5*, other *fs* minute; *des1,3,5* long and subequal, *des2* shorter but well developed, *des4* minute; *les1* about 0.5 x the length of *les2; vcs1* well developed, *vcs2* minute. Stemmata absent. Antennal sensorium prominent, with curved sides and subtruncate apex, which is slightly projected outwards (character of larva I). Clypeus (Fig. 33) pigmented at base, cls1,2 minute. Labrum (Fig. 33) with lms1 as widely separated than lms2, lms3 well developed but shorter than lms1,2; lateral sensilla between lms1,2; labral rods (Fig.34) rather short, darker at distal apex, slightly convergent towards the base. Epipharynx (Fig. 34) with mes1 slightly less separated than mes2; sensillum clusters between mes1 and mes2. Mandibles (Fig. 35) with mds1 long, mds2 minute and contiguous to mds1. Maxillae (Figs. 36, 37) with *dms8* shorter than the others. Premental sclerite (Fig. 36) with posterior extension rather short and truncate at apex. Thorax. Spiracle circular, bicameral, but the dorsal airtube distinctly shorter and with less number of rings than ventral airtube. Pronotum with 9 setae; epipleurum with 2 setae. TII, III with 4 equidistant pds, pds3 long; alar area with unequal as. Pedal area (Fig. 38) with setae u, x very small; w long and spatulate at apex (character of larva I); seta z absent. Abdomen (Fig. 39). Spiracles nearly unicameral, with only the ventral airtube annulated and conspicuous, the dorsal airtube very short, subglobular. AI-VII with pds3 very long, pds5 long, pds1 very short, and pds2,4 short; both ss1,2 in the spiracular area, but ss2 shifted towards postdorsum in posterior segments. AVIII with 4 pds, lacking the homologous pds1 of preceding segments; only ss1 in the spiracular area, ss2 absent. AIX con 3 ds, ds1 short on basal third of dorsum, ds2,3 on posterior margin of dorsum, ds2 very conspicuous and long, ds3 short; pleural setae very unequal, the dorsal minute. AX terminal, lateral anal lobes without setae (character of larva I), ventral lobe narrower than dorsal lobe.

Pororhynchus sp. (Figs. 32-39)

Larva I. Average dimensions (n = 10): body length 0.95 mm; head width: 0.24 mm. **Body** yellow, pronotum not pigmented. Setae translucid. **Head** yellow-brown, yellow near the epicranial and frontal lines, dark brown on the anterior margin and mandibles. Epicranial line (Fig. 32) less than 0.5 x the length of head capsule. Setae: fs5 short, about 0.5 x the length of fs4; des2 short, about 0.5 x the length of des1. **Thorax and abdomen**. Pronotum with setae 1,3,7,9 very small. Spiracles (Fig. 39) with the ventral airtube 4-5 annulated in AI-VII, 6-annulated in AVIII, dorsal airtube subglobular.

Specimens examined. Argentina. Numerous larvae I bred from eggs obtained by rearing several couples of adults collected in Mendoza, between Cacheuta and Potrerillos, 17-I-92, feeding on leaves of "jarilla" *Larrea nitida* (Zygophyllaceae), A. E. Marvaldi coll. [AEM].

Naupactus Dejean and allied genera

The following description is to a great extent coincident with definitions of "Naupactini" elaborated by Emden (1952: paragraphs 6-9 of the key and description of *Pantomorus*), May (1977, 1993, 1994), and Marvaldi & Loiácono (1994).

For the present study I examined larvae of species that are frequent in wild and cultivated areas of Argentina. Larvae of six species, collected in wild ecosystems, are described for the first time (Eurymetopus oblongus (Hustache), Naupactus rugosus Hustache, Naupactus ruizi (Brèthes), Naupactus sulphurifer Pascoe, Naupactus tucumanensis Hustache, and Naupactus verecundus Hustache). Larvae of other five species, more abundant in agricultural ecosystems, are redescribed (Asynonychus cervinus (Boheman), Atrichonotus taeniatulus (Berg), Naupactus leucoloma Boheman, Naupactus peregrinus (Buchanan), and Naupactus xanthographus (Germar)). Although these species are currently assigned to four genera (Asynonychus Crotch, Atrichonotus Buchanan, Eurymetopus Schoenherr, and Naupactus Dejean) their larvae do not show differences at generic level. This can be accounted for species of several nominal genera are assigned to the Pantomorus - Naupactus complex (Buchanan, 1939; Lanteri et al., 1989; Lanteri, 1990; Lanteri & Díaz, 1994; Lanteri & Marvaldi, 1995; Lanteri & Morrone, 1995; Morrone & Roig-Juñent, 1995). Thus, the present redescription of Naupactus Dejean is also applicable to its allied "genera".

Mature larva. Body (Figs. 45, 61, 68) robust, frequently widest at thorax. Cuticle asperities usually present on ventral areas, and absent or scarce on lateral and dorsal areas. Head (Figs. 43, 48, 62, 63) deeply retracted into thorax, longer than wide; posterior margin rounded or ogival, not emarginated; posterior half or third unpigmented,



Figures 32 - 39: *Pororhynchus* sp., larva 1. 32, head, dorsal; 33, clypeus and labrum; 34, epipharynx; 35, mandible, dorsal; 36, maxilla and labium, ventral; 37, maxilla, dorsal; 38, TII, pedal area; 39, AVIII-X, dorsal. Scales = 0.1 mm.

with softer integument, and without setae; setae shifted anteriorly, des1 in front of middle of head capsule, major setae on anterior third. Epicranial line more than 0.5 x the length of head capsule. Frontal lines and endocarina absent. Hypopharyngeal bracon with paramedian maculae. Postoccipital condyles rounded, hialine. Setae: fs4,5, des3,5, and les2 long, subequal, situated on anterior cephalic third; des1,2 and les1 shorter than the former and usually very reduced; fs1,2,3, des4, and pes minute; vcs1 longer than vcs2 or both vcs1,2 short. Stemmata vestigial or absent. Antennal sensorium about 2 x wider than long, truncate at apex. Labrum (Fig. 49) with *lms1,2,3* subequal; labral rods (Figs. 50, 60) bifurcate. Epipharynx (Fig. 50, 60) with mes1 less separated than mes2; clusters of 3 sensilla between mes1 and mes2 but closer to mes2: sensilla of each cluster usually fusionated forming a unit. Mandibles with mds1,2 subequal or *mds1* slightly longer than *mds2*, both transversely placed within the scrobe, mds2 exterior and slightly basal to mds1. Maxillae (Figs. 40, 41, 52, 53) frequently with spinules below mala and palpus. Premental sclerite (Figs. 40, 52) well sclerotized, with posterior extension truncate and sometimes also expanded at apex, anterior extension slender. Thorax (Fig. 54). Spiracle (Fig. 59a) ellipsoidal, with airtubes vestigial and subglobular or absent. Pronotum (Fig. 54) with 8-9 setae; epipleurum with 2 setae. TII, III with pds3 longer than others; alar area with 2 as. Pedal area (Fig. 65) with seta z usually conspicuous; set x smaller than y; u smaller than v; v smaller than w; seta v' present and rather conspicuous; y' usually distinct. Abdomen (Figs. 44, 55, 56, 57, 64). Spiracles (Figs. 59b,c) elliptical or subcircular, smaller than thoracic one, airtubes vestigial or absent. AI-VII with 5 pds; AI-IV with both ss1,2 in the spiracular area, AV-VII with ss2 shifted to postdorsum. AVIII with 4 pds, lacking the homologous pds2 of preceding segments, only ss1 in the spiracular area, ss2 absent. Abdominal apex modified, usually with a dorsoposterior sclerotized ridge in AVIII,IX, and transverse sclerotized ridges in pleura and sternum of AIX. AIX with 4 ds because there is an additional dorsal seta, ds', placed lateral to ds1. AX terminal, 3-4 setae on each lateral anal lobe.

Larva I. Head (Figs. 42, 47, 67) only slightly retracted into thorax, subcircular or slightly longer

than wide. Setae less shifted anteriorly, des1,2, and les1 less reduced than in older larvae; vcs1 longer than vcs2. Frontal lines distinct at least in their extremes. Stemmata as conspicuous dark pigmented spots. Antennal sensorium prominent and projected outwards. Labrum with lms3 shorter than lms1,2; frontal lines distinct at least in their proximal extremes. Epypharynx with the 3 sensilla of each cluster discernible. Mandibles (Fig. 51) with mds1,2 unequal, mds1 at least 2 x longer than mds2. Maxillae without spinules below mala and palpus. Thorax. Spiracle (Fig. 58a) bicameral with annulated airtubes; pedal area (Fig. 65) with setae z, and v' relatively small, sometimes absent, setae w relatively very long and usually blunt or spatulate at apex. Abdomen. Spiracles (Fig. 58b,c) smaller than thoracic one, with airtubes having less number of rings; abdominal apex with sclerotized ridges not or slightly distinct.

Remarks. An additional *ds* in AIX is also found in larvae of *Epicaerus* Schoenherr and in representatives of "Tanymeciina" *sensu* Emden (1944) such as *Tanymecus* Germar and *Pachnaeus* Schoenherr (Emden, 1952; personal observations).

Asynonychus cervinus (Boheman) (Figs. 40, 41)

Mature larva. Maximum dimensions (after May, 1977): body length 9.0 mm; head width 1.5 mm. Cuticle smooth, except in sterna AI-V with minute spiniform asperities. Setae fine, orange. Head yellowish, intense yellow on anterior margin of frons, about 1.5 x longer than wide. Setae: des1 minute; des2, les1 very small. Antennal sensorium with curved sides and subtruncate apex. Labral rods Vshaped. Maxillae (Figs. 40, 41) with a group of spinules below palpus, spinules absent below mala. Posterior extension of premental sclerite truncate and expanded at apex (Fig. 40). Thorax and abdomen. AII-V with pds1 2 x longer than pds2, the latter fine, inconspicuous. AV-VII with ss1 minute. AVIII, IX with slight transverse ridges. AIX with ds2 much longer (7-10 x) than ds1, the latter very small. AX with 3 small setae on each lateral anal lobe.

Larva I. Average dimensions (n = 10): body length 1.30 mm; head width 0.25 mm. Head subcircular. Setae: *des1,2* and *les1* conspicuous, nearly as long as *des3,5* and *les2*. Mandibles with *mds1* about 3 x longer than *mds2*.

Specimens examined. Argentina. Córdoba, La Cumbre, 6-XII-91, A. Marvaldi & A. Lanteri colls., numerous larvae I bred from adults with the collection data given above [MLP, AEM]. U.S.A. Alabama, Crichton, Mobile Co., 14-III-38, in "grass roots nursery", Henderson coll., 4 larvae [NMNH]; 15-IV-38, in "misc. weeds", Winkler et al. colls., 4 larvae [NMNH]; California, Spring Valley, 7-II-54, Wilkey col., 2 larvae I [NMNH]; North Carolina, Moore County, 13-XII-39, Turner coll., 1 larvae I [NMNH].

Atrichonotus taeniatulus (Berg) (Figs. 42-44)

Mature larva. Maximum dimensions: body length 7.00 mm; head width 1.25 mm. Cuticle with spiniform asperities in prodorsum of AI and in sterna of TI-III and AI-VII. Setae fine, pale. Head (Fig. 43) yellowish, intense yellow on anterior part of frons. Setae: des1,2 minute, like des4 and pes; les1 very small. Antennal sensorium with subparallel sides and truncate apex. Labral rods U-shaped. Maxillae with spinules widely distributed on dorsal surface of stipes, longer spinules grouped below palpus and below mala. Posterior extension of premental sclerite truncate at apex. Thorax and abdomen. AVIII (Fig. 44) with a strongly sclerotized dorsoposterior ridge. AIX (Fig. 44) with transverse sclerotized ridges in dorsum, pleura and sternum; ds2 3-4 x longer than ds1. AX with 3 small setae and 1 strong exterior seta.

Larva I. Average dimensions (n = 10): body length 1.10 mm; head width 0.18 mm. **Head** (Fig. 42) somewhat longer than wide. Cephalic setae with relative lengths similar to mature larva. Mandibles with *mds1* about 3 x longer than *mds2*.

Specimens examined. Argentina. La Pampa, Santa Rosa, 28-II-91 and 9-V-91, in alfalfa field, E. Quirán coll., numerous larvae I bred from adults with the collection data given above [MLP, AEM]. U.S.A. Alabama, Florala, 27-I-41, in "grass pasture", J. H. Girardeau coll., 4 larvae [NMNH]; 13-I-42, H. C. Young coll., 1 larvae [NMNH]; North Carolina, Wedesboro, 24-VII-44, in "Goldenrod + Lespedeza", 1 larvae [NMNH].

Eurymetopus oblongus (Hustache) (Figs. 45, 46)

Mature larva. Maximum dimensions: body length 8.80 mm; head width 1.08 mm. Cuticle with conspicuous spiniform asperities, densely distributed in ventral areas of thorax and abdomen, blunt asperities present on dorsal areas, lateral areas smooth, anal lobes (Fig. 46) with divided asperities having 4-7 spinelike projections. Setae fine, pale. Head yellowish, darker on anterior margin, 1.3 x longer than wide. Setae: des1,2 minute, les1 very small. Antennal sensorium about 3 x wider than long, with subparallel sides and truncate apex. Labral rods broad, U-shaped. Maxillae with a group of 5-6 long and several shorter spinules below palpus, and another group below mala. Posterior extension of premental sclerite truncate at apex. Thorax and abdomen. AVIII (Fig. 45) with conspicuous dorsoposterior sclerotized ridge. AIX (Fig. 45) with transverse sclerotized ridges in dorsum, pleura and sternum; ds2 about 2 x longer than ds1. AX (Fig. 46) with 3 small setae and 1 strong exterior seta.

Larva I. Not known for this species, but first instar larva of *E. fallax* Boheman (Lanteri *et al.*, 1997; personal observation) also has *des1*,2 and *les1* minute, but its cuticle is smooth.

Specimens examined. Argentina. San Luis, National Route 7 (km 745), 40 km to S. Luis City, 2-I-94, in soil feeding on roots of herbaceous plants, mainly cruciferous, associated adults det. by A. Lanteri, A. Marvaldi coll., 3 larvae [AEM].

Naupactus leucoloma Boheman (Figs. 47-59)

Mature larva. Maximum dimentions: body length 15.0 mm; head width 2.5 mm. Body creamywhite. Cuticle smooth except sterna AI-V (Fig. 55) with a transverse row of spiniform asperities. Setae fusiform, red-brown. Head (Fig. 48) pale yellow on anterior part of frons; 1.3 x longer than wide. Setae: *des1,2* and *les1* small but conspicuous, longer than *des4* and *pes*. Antennal sensorium about 2 x wider than long, with divergent sides and truncate apex. Labral rods (Fig. 50) axeshaped. Maxillae (Fig. 53) with a group of long spinules below palpus and another group below



Figures 40 - 46: 40, 41, Asynonychus cervinus, mature larva. 40, maxilla and labium, ventral; 41, maxilla, dorsal. 42 - 44. Atrichonotus taeniatulus. 42, 43, head, dorsal. 42, larva I; 43, mature larva; 44, AVII-X, lateral, mature larva. 45, 46. Eurymetopus oblongus, mature larva. 45, habitus, lateral; 46, AX, caudal. Scales, 40 - 42, 46 = 0.1 mm; 43 - 45 = 1 mm.



Figures 47 - 53: *Naupactus leucoloma*. 47, head, dorsal, larva 1; 48, head, dorsal, mature larva; 49, clypeus and labrum, mature larva; 50, epipharynx, mature larva; 51, mandible, larva 1; 52, maxilla and labium, ventral, mature larva; 53, maxilla, dorsal, mature larva. Scales, 47, 51 = 0.1 mm; 48 - 50, 52, 53 = 0.5 mm.



Figures 54 - 59: *Naupactus leucoloma*. 54 - 57, mature Iarva. 54, TI-III, lateral; 55, AIV, lateral; 56, AVIII-X, lateral; 57, AIX, X, caudal; 58, 59, spiracles (a, thorax; b, AIV; c, AVIII). 58, larva 1; 59, mature larva. Scales = 0.5 mm, except 58 = 0.1 mm.

mala. Posterior extension of premental sclerite (Fig. 52) truncate at apex. Thorax and abdomen. Transverse ridges on AVIII,IX (Fig. 56, 57) slightly distinct. AIX with ds2 about 3 x longer than ds1. AX (Fig. 57) with 4 small setae, the exterior not much stronger than the others.

Larva I. Average dimensions (n = 10): body length 1.40 mm; head width 0.24 mm. **Head** (Fig. 47) with *des1*, 2 and *les1* well developed, not much

shorter than des3,5 and les2. Mandibles (Fig. 51) with mds1 about 2 x longer than mds2. Thorax and abdomen. Pedal area with seta z absent.

Specimens examined. Argentina. Buenos Aires, La Plata, 2-I-91, on *Wedelia glauca* (Asteraceae), A. Marvaldi coll., numerous larvae I bred from parthenogenetic female with the collection data given above [MLP, AEM]; Quilmes, 10-XII-90, on *W. glauca*, A. Marvaldi coll., numerous larvae I bred from parthenogenetic female with the collection data given above [MLP, AEM]; 14-I-91, 12-II-91, and 25-II-92, on Solidago chilensis (Asteraceae) and other plants, A. Marvaldi coll., numerous larvae I bred from parthenogenetic females with the collection data given above [MLP, AEM]; La Pampa, Anguil, 1990-1991, in alfalfa field, E. Quirán coll., 5 larvae [MLP]: Santa Fe, Manfredi, 1989, in alfalfa field, S. P. Stock coll., 5 larvae [MLP]. U.S.A. Alabama, Florala, 17-IX-37, H. C. Young coll., 4 larvae [NMNH]; California, San Bernardino Co., 8-IX-88, on red clover, Seeno et al. colls., 10 larvae [MLP]; Louisiana, Arabi, 22-III-38, in grass, C. E. Whittington coll., 1 larvae [NMNH]; Louisiana, New Orleans, 22-XI-37, feeding on roots of "Alligator grass" (Alternanthera philoxeroides), J. M. Singleton coll., 1 larva [NMNH]. Uruguay. Colonia, La Estanzuela, 1989, R. Alzugaray coll., 6 larvae [MLP].

Naupactus peregrinus (Buchanan) (Fig. 60)

Mature larva. Similar to *N. leucoloma* except for its smaller size (maximum body length 11.00 mm and head width 1.80 mm), cuticle with minute asperities on sterna AI-V; labral rods (Fig. 60) Ushaped; AIX with *ds2* about 4 x longer than *ds1*.

Larva I. Spiracular airtubes short and broad; TI-III with seta z conspicuous.

Specimens examined. U.S.A. Mississipi, Gulfport, 25-II-38, Pasterson & Sheffield colls., 5 larvae [NMNH]; Saucier, 10-VIII-37, bred from eggs, H. C. Young coll., 2 larvae I [NMNH]; 23-XI-37, H. C. Young coll., 1 larva [NMNH]; without loc., 10-III-38, in soil, H. W. Winkler coll., 2 larvae [NMNH]; 7-IV-38, Gurley & O'Brien colls., 2 larvae [NMNH]; 28-I-41, W. H. Anderson det., 5 larvae [NMNH].

Naupactus rugosus Hustache

Larva I. Average dimensions (n = 10): body length 1.93 mm; head width 0.30 mm. **Body** whitish-yellow; head yellowish, brown on anterior margin and mandibles; stemmata black. Cuticle with spiniform asperities located in transversal rows between the sternal and lateroesternal setae of AI-V, and densely distributed on AX. Setae pale, of moderate length. **Head** slightly longer than wide, wider anteriorly. Setae: des1,2 and les1 well developed, subequal to des3 and fs5 and not much shorter than des5 and fs4. Antennal sensorium 1.5 x wider than long. Labral rods V-shaped, with the internal arms very short. Mandibles with mds1 about 2 x longer than mds2. Maxillae with dms1 0.5 x the length of the other dms. Posterior extension of premental sclerite truncate and expanded at apex. **Thorax and abdomen**. Pedal area of TI-III with setaz conspicuous; setae x' and v' present. AX with 3 small setae and 1 strong exterior seta.

Specimens examined. Argentina. Mendoza, San Rafael, Embalse El Nihuil, 6-III-94, adults mating and feeding on "melosa" *Grindelia chiloensis* (Asteraceae), A. Marvaldi coll., numerous larvae I bred from two adult couples with the collection data given above [AEM].

Naupactus ruizi (Brèthes) (Figs. 61-64)

Mature larva (Fig. 61). Maximum dimensions: body length 16.6 mm; head width 2.6 mm. Cuticle smooth except around pedal areas with minute spiniform asperities. Setae orange-yellow. Head (Figs. 62, 63) intense yellow, with a brown color pattern on the anterior margin, around epicranial line and in bands on each epicranial half; head 1.3 x longer than wide Setae: des1,2 and les1 short but conspicuous, distinctly longer than des4 and pes, less than 0.5 x the length of fs4, des3,5 and les2; des2 slightly longer than des1 and les1. Antennal sensorium about 2.5 x wider than long, with subparallel sides and truncate at apex. Labral rods U-shaped. Maxillae with a group of long spinules below palpus and another group below mala; stipital seta 2 conspicuous. Posterior extension of premental sclerite truncate and expanded at apex. Thorax. Pedal area with setae z and v' conspicuous, x'present; minute spinules around pedal areas. Abdomen (Fig. 64). Terminal sclerotized ridges hardly distinct. AIX with ds2 2 x longer than ds1. AX with 3 conspicuous setae, the exterior one about 2 x longer than the others.

Larva I (also see Marvaldi & Loiácono, 1994). Average dimensions (n = 10): body length 1.60 mm; head width 0.25 mm. Body setae very long. Head



Figures 60 - 68: 60, *Naupactus peregrinus*, epipharynx, mature larva. 61 - 64. *Naupactus ruizi*, mature larva. 61, habitus, lateral; 62, head retracted into thorax, dorsal; 63, head exposed after dissection, dorsal; 64, AVIII-X, caudal. 65, 66, *Naupactus sulphurifer*, larva I. 65, TII, sternal seta and pedal area. 66, AI, sternal and laterosternal setae; 67, 68. *Naupactus verecundus*, habitus, lateral. 67, larva I; 68, mature larva. Scales 60, 65, 66 = 0.1 mm; 62 - 64, 67 = 1 mm; 61, 68 = 5 mm.

with conspicuous black stemmata; *des1* very small and subequal to *pes*; *des2* and *les1* long but less than 0.5 x the length of *des3,5* and *les2*.

Specimens examined. Argentina. La Pampa, Santa Rosa, 28-II-91, on Medicago sativa, E. Quirán coll., numerous larvae I bred from adults with the collection data given above [MLP, AEM]; Mendoza, Potrerillos, 17-I-92, A. Marvaldi & S. Roig colls., numerous larvae I bred from adults with the collection data given above [MLP, AEM]; near "Pto. de Gendarmería Nacional El Portillo", 19-I-92, A. Marvaldi & D. Rodríguez colls., numerous larvae I bred from adults with the collection data given above [MLP, AEM]; near Vallecitos, 1-III-93, in soil under snow among roots of Stipa sp. (Gramineae), A. Marvaldi & D. Rodríguez colls., reared adult female det. by A. Lanteri, 2 larvae [AEM]; same data, numerous larvae I bred from the latter parthenogenetic female [AEM].

Naupactus sulphurifer Pascoe (Figs. 65, 66)

Larva I. Average dimensions (n = 10): body length 1.9 mm; head width 0.3 mm. Body whitevellowish; head brown-yellowish; mandibles and stemmata brown. Cuticle smooth. Setae very long, translucid. Head slightly longer than wide. Setae: des1,2 long though shorter than des3,5; les1 long and subequal to les2. Antennal sensorium 1.5 x wider than long. Labral rods V-shaped with the internal arms very short. Mandibles with mds1 4 x longer than mds2. Maxillae with dms1 0.5-0.7 x the length of the other dms. Posterior extension of premental sclerite expanded and truncate at apex. Thorax. Pedal area (Fig. 65) with setaz a little larger in TI than in TII,III; seta x' present, v' minute; seta w very long and spatulate at apex. Abdomen. AI-VIII with major setae of dorsal and lateral areas (pds3,5, epipleural seta 2, pleural seta 2, and ss2) extremely long. AI-VI (Fig. 66) with laterosternal seta spatulate at apex and about 3 x longer than sternal seta. AVII, VIII with laterosternal seta not spatulated and only 1.5 x longer than sternal setae. AIX with dsl and ds' small, ds2 very long and ds3 long; pleura with seta 1 minute and seta 2 long. AX with 3 small setae on each lateral anal lobe.

Specimens examined. Argentina. Mendoza, Santa Rosa, Ñacuñán Natural Reserve, 8-III-94, on "jarilla" *Larrea cuneifolia* (Zygophyllaceae), G. Flores coll., 10 larvae I bred from adults with the collection data given above [AEM]; Tunuyán, 12-III-93, on *Larrea* sp., S. Roig coll., numerous larvae I bred from adults with the collection data given above [AEM].

Naupactus tucumanensis Hustache

Larva I. Average dimensions (n = 10): body length 1.60 mm; head width 0.27 mm. Body creamywhite; head yellowish; mandibles and stemmata brown. Cuticle smooth. Setae of moderate length. Head subcircular, as wide as long. Setae: des1,2and les1 conspicuous, long, not much shorter than des3,5 and les2. Antennal sensorium 1.5 x wider than long. Labral rods V-shaped, with the internal arms very short. Mandibles with mds1 about 3 x longer than mds2. Maxillae with subequal dms. Posterior extension of premental sclerite truncate and expanded at apex. Thorax. Pedal area with seta z conspicuous in TI, very small in TII,III; seta x' present and v' absent. Abdomen. Anal lobes apparently without setae.

Specimens examined. Argentina. Córdoba, La Cumbre, 6/7-XII-91, on *Oenothera* sp. (Onagraceae), A. Marvaldi & A. Lanteri colls., numerous larvae I bred from adults with the collection data given above [MLP, AEM].

Naupactus verecundus Hustache (Figs. 67, 68)

Mature larva (Fig. 68). Maximum dimensions: body length 14.94 mm; head width 1.80 mm. Body creamy-white, anterior part of pronotum yellow as head. Cuticle smooth, except by spiniform asperities located on sterna of AI-VI, in transversal rows, and on anal lobes. Setae red-brown. Head yellow, darker on anterior margin, 1.3 x longer than wide. Setae: *des1*,2 and *les1* small but larger than *des4* and *pes*, *des1* slightly shorter than *des2* and *les1*. Antennal sensorium about 2.5 x wider than long, with subparallel sides and truncate apex. Labral rods L-shaped. Maxillae with a group of long and short spinules below palpus and another group below mala. Posterior extension of premental sclerite truncate and expanded at apex. Thorax. Pedal area with setae z and v' conspicuous (z about 2 x longer than v'); x' present. Abdomen. AVIII, IX with dorsoposterior sclerotized ridges; AVIII with epipleura, pleura, and lateroesternal areas as sclerotized convex lobes. AIX with ds2 about 4 x longer than ds1. AX with 3 small setae and 1 strong exterior seta (3 x longer than the others).

Larva I (Fig. 67). Average dimensions (n = 10): body lengthh 1.53 mm; head width 0.28 mm. Head slightly retracted into thorax; frontal lines distinct; stemmata conspicuous, the anterior larger than posterior; setae: des1, 2 and les1 long, not much shorter than des3, 5 and les2; mandibles with mds1 about 3 x longer than mds2.

Specimens examined. Argentina. Córdoba, La Cumbre, 6-XII-91, A. Marvaldi & A. Lanteri colls., numerous larvae I bred from adults with the collection data given above [AEM]; Mendoza, 21-I-92, A. Marvaldi coll., numerous larvae I bred from adults with the collection data given above [AEM]; San Luis, El Volcán, 10-I-93, on "dondiego de noche" (Onagraceae), A. Marvaldi coll., 10 larvae I bred from adults with the collection data given above [AEM]; National Route 7 (km 745), 40 km to S. Luis City, 2-I-94, on herbaceous plants, mainly cruciferous, larvae in soil feeding on roots, and adults on aerial plant parts feeding on leaves and petals, A. Marvaldi coll., 5 larvae I bred from adults, 2 larvae [AEM].

Naupactus xanthographus (Germar)

Mature larva. Maximum dimensions: body length 20.0 mm; head width 2.2 mm. Body slender, slightly curved, coloration pale yellow; cuticle with small spiniform asperities widely distributed. Head strongly retracted into thorax, exposed part redbrown and with callosities on anterior margin; head 1.5 x longer than wide. Setae: des1,2 short, les1 short but longer than des1,2; fs3 larger than fs1,2 and subequal to des1,2. Antennal sensorium about 2 x wider than long, with divergent sides and truncate apex. Mandibles with mds1,2 subequal, mds1 only 1.2 x longer than mds2. Maxillae with a group of spinules below palpus. Thorax and abdomen. Dorsum, pleura and sternum of AIX each with a strongly raised sclerotized transverse keel; ds2 2 x longer than ds1. AX with 4 small subequal setae.

Larva I. Average dimensions (n = 10): body length 2.50 mm; head width 0.25 mm. Head subcircular; *des1*, 2 and *les1* conspicuous, not much shorter than *des3*, 5 and *les2*; mandibles with *mds1* about 4 x longer than *mds2*.

Specimens examined. Argentina. Buenos Aires, Pereyra, 11-I-91, A. Marvaldi & D. Rodríguez colls., numerous larvae I bred from adults with the collection data given above [MLP, AEM]; Mendoza, Chacras de Coria, 20-X-92, in soil feeding on roots of vine, A. Marvaldi coll. det. by associated adults, 4 larvae [AEM]. Chile. Santiago, "Subestación Experimental de Control Biológico La Cruz", R. Ripa leg., several larvae of different instars [MLP].

Platyaspistes Schoenherr

The larva of *Platyaspistes argentinensis* Kuschel is described and illustrated for the first time. For comparative purposes I have also studied material [NHM] from India and China of other three related species, assigned to the genera *Piazomias* Schoenherr, *Leptomias* Faust, and *Pachynotus* Redtenbacher, described previously by Gardner (1934, 1938) and Emden (1952).

Larva I. Head (Fig. 69, 70) slightly wider than long. Frontal lines visible in their entire length. Endocarina absent. Setae: vcs1,2 very unequal, vcs2 minute. Antennal sensorium 0.5 x wider than long. Clypeus (Fig. 71) clear, cls1,2 minute. Labrum (Fig. 71) with lms1 as widely separated than lms2, lms3 shorter than *lms1*,2; lateral sensilla between *lms1*,2. Epipharynx (Fig. 72) with mes I slightly more separated than mes2. Mandibles (Fig. 73) with mds1 very much longer than mds2. Maxillae (Fig. 74, 75) with 9-10 dms. Labium (Fig. 74) with posterior extension of premental sclerite short and truncate at apex. Thorax (Fig. 76). Spiracle bicameral with annulated airtubes. Pronotum with seta 3 at the same level than seta 2, seta 9 very small. TII, III with pds1 shorter than the other pds; alar area with 2 very unequal as. Pedal area (Fig. 77) with seta z conspicuous. Abdomen (Fig. 78). Spiracles similar to thoracic one. AVIII with postdorsum sclerotized and projected caudally, semicircular in apical view; 3 pds long and strong, both ss1,2 present, ss2 at level with pds but not within the sclerotized postdorsum. Abdominal apex of type "A": AIX



Figures 69 - 75: *Platyaspistes argentinensis*, larva I. 69, head, dorsal; 70, head, ventral; 71, clypeus and labrum; 72, epipharynx; 73, mandible; 74, maxilla and labium, ventral; 75, maxilla, dorsal. Scales = 0.1 mm.

very sclerotized, dorsum subtriangular with ds1,2long, ds3 very small on posterior declivity; pleurum with seta 1 minute and seta 2 strong. AX (Fig. 79) with 3 setae, the intermedian one about as long and strong as the sternal setae of AVIII, IX.

Platyaspistes argentinensis Kuschel (Figs. 69-79)

Larva I. Average dimensions (n = 10); Body length 1.76 mm; head width 0.33 mm. **Body** creamy-white, yellowish-brown on sclerotized posterior extreme, pronotum not pigmented. Cuticle with small spiniform asperities widely distributed. **Head** (Fig. 69) yellowish-brown, darker on anterior margin. Epicranial line 0.4 x the length of head capsule. Setae: *des4* and *fs1,2,3* very minute; *pes1-*4 in line behind *des2*. Labrum (Fig. 71) with *lms1* slightly more separated than *lms2*. Epipharynx (Fig. 72) with *ams* very much smaller than *als*. Mandibles (Fig. 73) with *mds1* about 6 x longer than *mds2*.

Remarks. The oviposition habits and host preferences of *Platyaspistes glaucus* Fahraeus from Chile (Jackson, 1987) are very similar to those observed for *P. argentinensis* Kuschel. Jackson's publication presents a brief description of the larva I of *P. glaucus*, but it is not sufficiently detailed (*e.g.* setal index includes only major setae visible under stereoscopic microscope) to allow a comparison of larval characters between *P. glaucus* and *P. argentinensis*.

The larva of *Platyaspistes* does not fit exactly Emden's (1952: paragraphs 6, 54, 62, 63, 69, 70, 71, 81 of the key) definition of "Piazomiina", based on larvae of Piazomias, Leptomias, and Pachynotus. Larvae of the last three have 1 as (a second as minute?), pronotum with seta 3 (Emden's seta c) below level of seta 2 (Emden's seta b), and AVIII with 4 pds and ss2 absent. Platyaspistes, instead, have 2 as (Fig. 76), pronotum with seta 3 at the same level than seta 2, and AVIII (Fig. 78) with 3 pds and ss2 present; in addition, the number of dorsal malar setae are in excess, and in AX (Fig. 79) the 3 anal setae are distinct. They all share, however, the labral rods (Fig. 72) reduced and slightly transversal, frontal lines (Fig. 69) visible in their entire length, epipharynx (Fig. 72) with mes1 slightly more separted than mes2; abdominal apex (Fig. 78) of type "A"; lateral anal lobes (Fig. 79) each with a very conspicuous seta.

Specimens examined. Argentina. Mendoza, San Rafael, Nihuil Valle Grande, 5-III-94, on "chilca dulce" *Tessaria dodoneaefolia* (Asteraceae), A. Marvaldi coll., 15 larvae I bred from adults with the collection data given above [AEM].

DISCUSSION

The larval characters herein described for Cylydrorhinus, an exclusively Andean and Patagonian South American genus (Kuschel, 1991), support its assignment to Entiminae on account of the maxillary mala with 4 ventral setae, and antennal sensorium wider than long and cushion-like (Marvaldi, 1997). Its placement in the tribe Entimini (Marvaldi, 1997, 1998b) is justified by the elliptical (apical view) antennal sensorium, and the posterior extension of premental sclerite with subparallel sides, among other features. The traditional subfamily "Cylydrorhininae" contained two tribes: "Cylydrorhinini" and "Listroderini" distinguished by Kuschel (1958) because adults of the former have deciduous mandibular processes or the corresponding scar. Kuschel (1962:74) also found differences in the larval characters between Caneorhinus sp. ("Cylydrorhinini") and several "Listroderini", concluding that "Caneorhinus differs conspicuously in the characters of the antennae, the lack of ocelli, the wholly different structure of the spiracles, and in the greater abundance of setae on both the tergites and sternites of segments 7-9". Accordingly, Wibmer & O'Brien (1986: 112) transferred "Cylydrorhinini" to Entiminae (and treated "Listroderini" within Rhytirrhininae), decisions well supported by larval evidence (Marvaldi, 1997, 1998a). The extremmely long and multiannulated spiracular airtubes of the larva I in Cylydrorhinus are, however, not known for other Entimini. The larva of Cylydrorhinus can easily be distinguished from one of Rhytirrhininae because of its cushion-like antennae and well developed lateral labral setae.

Malvinius, endemic of Malvinas Islands and created by Kuschel (1950: 11) for the type species *Listroderes compressiventris* Enderlein, is another genus whose larva is described here for the first time. Its larval characters also fit phylogenetic defi-



Figures 76 - 79: *Platyaspistes argentinensis*, larva I. 76, TI-III, AI, lateral; 77, TII, pedal area; 78, AVII-X, lateral; 79, AX, caudal. Scales = 0.1 mm.

nitions of Entiminae and Entimini (given above for Cylydrorhinus). The larva of Entimus shares with larvae of Eudiagogus (Emden, 1952; Kovarik & Burke, 1985) and of Premnotrypes (personal observation) the maxillae with minute intermediate vms. These three taxa are well represented in the Neotropical region (Wibmer & O'Brien, 1986), and Eudiagogus may be closer to Entimus because their larvae have conspicuous endocarina and AVIII with 3 pds, while the larva in Premnotrypes (Emden, 1952) lacks endocarina and has 4 pds in AVIII. This paper also presents the first description of a larva of the South American genus Pororhynchus. It is similar to those of Eudiagogus and Entimus in having a very distinct endocarina and ds1 of AIX very short and located far away from ds2,3.

The bifurcate labral rods present in all studied larvae of the South American Naupactus and "allied genera" (i. e. Asynonychus, Atrichonotus, Eurymetopus, etc.) might be synapomorphic for the group. Other diagnostic feature is the presence of 4 ds in AIX (the modal number is 3). An additional ds in AIX is also found in larvae of Epicaerus and in representatives of "Tanymeciina" sensu Emden (1944) such as Tanymecus (personal observation) and Pachnaeus (Emden, 1952). These setae, if homologous, suggest a close phylogenetic relationship of these taxa. The Nearctic Epicaerus may be closer to Naupactus because their larvae have mandibles with mds1,2 transversely set in the scrobe and head retracted into thorax.

A close relationship between the South American *Platyaspistes* and other "Piazomiina" sensu Emden (1944, 1952), such as *Piazomias*, *Leptomias*, and *Pachynotus*, can be proposed on the basis of larval characters herein described. The labral rods reduced and slightly transverse might be synapomorphic for this group. In addition, these taxa share the abdominal apex with sclerotization of type "A", a very conspicuous anal seta, and the epipharynx with mes1 slightly more separated than mes2.

In conclusion, discovery of larvae of *Cylydrorhinus* and *Malvinius* supports previous changes in classification based on adult features. Larvae of *Entimus, Pororynchus*, and *Platyaspistes* confirm the taxonomic placement of these taxa. Finally, larval evidence suggests the naturalness of *Naupactus* and allied genera, and a close relationship of this group to *Epicaerus*, as well as to

Tanymecus and allies. It would be interesting to see if adult characteristics also support the latter proposal. The examples reported in this paper show the value of larval characters to provide clearer answers or to raise new questions about weevil systematics.

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LITERATURE CITED

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