

**A revision of the genus *Hemiosus* SHARP, 1882
in South America (Coleoptera: Hydrophilidae)**

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Abstract

A revision of the genus Hemiosus SHARP, 1882, in South America. A key to the South-American species of Hemiosus is given, with localities. Nine new species are described; two in the maculatus-group: H. aequatorialis sp. nov. from Venezuela and Peru and H. irinus sp. nov. from North-eastern Argentina; seven in the dejeani-group: H. apicalis sp. nov. from North-eastern Argentina and Uruguay; H. bacchusi sp. nov. from Venezuela, H. costalis sp. nov. from Brazil (Amazonas); H. fittkai sp. nov. from Brazil (Amazonas); H. monstrosus sp. nov. from Brazil (Amazonas); H. punctipennis sp. nov. from Uruguay and H. sculptipennis sp. nov. from Eastern Argentina. Male genitalia and mesosternal processes of described species have been figured, together with a few additional characters. Distribution of all the species is mapped. It was considered that differences between "groups" did not warrant the erection of subgenera. It is suggested that preference for sandy bottoms in Hemiosus kept this genus from attaining the evolutionary success of Berosus, in which pioneering species are not selective of substrata.

Résumé

Révision du genre Hemiosus SHARP, 1882 en Amérique du Sud. On donne une clé pour les espèces sud-américaines d'Hemiosus, avec localités. Neuf espèces nouvelles sont décrites; deux dans le groupe maculatus: H. aequatorialis sp. nov. du Venezuela et du Pérou, et H. irinus sp. nov. du nord-est de l'Argentine; sept dans le groupe dejeani: H. apicalis sp. nov. du nord-est de l'Argentine et de l'Uruguay; H. bacchusi sp. nov. du Venezuela, H. costalis sp. nov. du Brésil (Amazonas), H. fittkai sp. nov. du Brésil (Amazonas); H. monstrosus sp. nov. du Brésil (Amazonas), H. punctipennis sp. nov. d'Uruguay et H. sculptipennis sp. nov. de l'est de

l'Argentine. Les genitalia et les processus mésosternaux des espèces nouvelles ont été figurés, ainsi que quelques autres caractères. La distribution de toutes les espèces est figurée. On a considéré que les différences entre "groupes" ne justifiaient pas l'érection de sous-genres. Il est ici suggéré que la préférence des Hemiosus pour les fonds de sable a été un empêchement pour atteindre le succès évolutif du genre Berosus, dont les espèces pionnières ne manifestent pas d'exigences particulières vis-à-vis du substrat.

Resumen

Revisión del género Hemiosus SHARP, 1882 en América del Sur.

Se da una clave para las especies sudamericanas de Hemiosus, con las localidades. Se describen nueve especies nuevas; dos en el grupo maculatus: H. aequatorialis sp. nov. de Venezuela y de Perú, y H. irinus sp. nov. del noreste de la Argentina; siete en el grupo dejeani: H. apicalis sp. nov. del noreste de la Argentina y de Uruguay, H. bacchusi sp. nov. de Venezuela, H. costalis sp. nov. de Brasil (Amazonas), H. fittkaui sp. nov. de Brasil (Amazonas), H. monstrosus sp. nov. de Brasil (Amazonas), H. punctipennis sp. nov. del Uruguay y H. sculptipennis sp. nov. del este de la Argentina. Se ilustran los genitalia y los procesos mesosternales de todas las especies descritas, además de algunos otros caracteres. Se indica en mapas la distribución de todas las especies. Se ha considerado que las diferencias entre los "grupos" no justificaba la erección de subgéneros. Se sugiere que la preferencia de los Hemiosus por fondos arenosos ha impedido un éxito evolutivo comparable al del género Berosus, en el cual las especies pioneras no son selectivas de su sustrato.

1. Introduction

1.1 General considerations

The genus *Hemiosus* SHARP, 1882 comprises small species, rarely over 3 mm in length. The shape of the body is elongately oval in dorsal view, in lateral view convex, with the greatest height a little behind the middle of the elytral length. Eyes are prominent. The whole dorsal surface bears a sculpture made up of sunken punctures, usually deep, and of a punctulation, with the ground smooth in between; in a few cases, punctures are obsolete and part of the ground is reticulate. The length of the scutellum is about twice the basal width. The elytra bear ten longitudinal punctated striae, plus a short "scutellary" one between first and second; the humeral hump is prominent. The presence of trichobothria on the dorsal surface is indicated by coarser, denser, more irregular punctures on the head near the eyes, on the pronotal sides behind the eyes, and on the odd-numbered elytral interstriae (OLIVA, 1992). The dorsum has a colour pattern of testaceous (nonpigmented cuticle) and melanic areas, the latter with or without metallic sheen. The ventral surface and the bases of femora are pubescent. The middle part of the mesosternum is strongly raised into a mesosternal

process. The metasternum bears a median-posterior process which is weakly raised, indistinctly delimited except behind, where its shape is determined by the anterior edge of the hind femora when they are directed forwards; the middle of the metasternal process is depressed; inside this depression there are two smaller, glabrous depressions, one behind the other. Apparent urosternites are five; the last one bears a shallow apical notch. Fore tibiae are linear; middle and hind tibiae bear swimming hairs, like the tarsi. Male genitalia are of a simple trilobed type, depressed, with closed basal piece, simple paramera that do not swivel on the basal piece (ORCHYMONT, 1940) and a median lobe with a pair of lateral appendices.

1.2 Position of the genus

1.2.1 Discussion of characters

The long scutellum and the swimming hairs on middle and hind tibiae are characters of the tribe Berosini. Furthermore, all Neotropical Berosini have five apparent urosternites with an apical notch on the fifth. The moderately convex, not compressed shape, with prominent humeral humps, the partially testaceous dorsum, the prominent eyes, the scutellary stria on elytra, the metasternal process with a median depression and the linear fore tibiae are characters shared by the genera *Hemiosus* and *Berosus* LEACH, 1817. These genera are thus set apart from *Derallus* SHARP, 1882, which has a subglobular shape laterally compressed, eyes not prominent, elytra without scutellary stria, metasternal process with a longitudinal carina, fore tibiae broadened apically and dorsal surface entirely melanic, the last being a character unknown in *Hemiosus* and extremely rare in *Berosus*.

According to the original description, the genus *Hemiosus* is characterized by short maxillary palpi, silky, very fine ventral pubescence, mesosternal process dilated on the ventral face and deep abdominal sutures. The last is in fact subject to variation depending on the state of specimens. There is one exception to the dilation of the mesosternal process: *Hemiosus dejeani* (SOLIER, 1859) in which the process is narrow, tabular, quite different from the laminar process of most species of *Berosus*. Another character mentioned by SHARP in the original description is the broad, flat carina on the first apparent urosternite, together with the presence of basal carinae on second to fourth urosternites; in fact the carina of the first urosternite may be narrow, the others may be absent. One character passed over by SHARP, and appearing in all the species of *Hemiosus*, is a pair of short lateral carinae on the first apparent urosternite. Male genitalia show a clear distinction between *Hemiosus* and *Berosus*: in the first, the genitalia are depressed, the basal piece closed, usually asymmetrical at the base, the paramera are not articulated with the basal piece, the median lobe bears a pair of lateral appendices; in *Berosus* the genitalia are subcylindrical or compressed, the paramera are articulated with the basal piece and may bear inner appendices, the median lobe has no lateral appendices (cf. ORCHYMONT, 1940; OLIVA, 1989b). Finally, in *Hemiosus* there are two

characters of the legs, mentioned by ORCHYMONT (1940): the femoral pubescence is oblique and the fore tarsi of males are pentamerous, not tetramerous as in *Berosus*. It may be added that the basal segments of the fore tarsi of males are hairy in many species, but those hairs never have their tips modified into adhesive disks as in *Berosus* (OLIVA, 1992).

1.2.2 Key to Neotropical genera of Berosini

- 1- Shape subglobular, more or less compressed. Dorsum entirely melanic. Eyes not prominent. No scutellary stria on elytra. Metasternal process with longitudinal carina. Fore tibiae broadening towards apex *Derallus*
- 1'- Shape not compressed, either strongly convex, with pronotum and humeral humps prominent, or moderately convex, with dorsum evenly curved. Dorsum testaceous at least in part, usually spotted, rarely entirely melanic. Eyes prominent. Elytra with scutellary stria. Metasternal process with median depression. Fore tibiae linear 2
- 2- Mesosternal process never laminar. First apparent urosternite with lateral carinae. Basal pubescence of femora strongly oblique. Protarsi of males pentamerous, the basal segments never with modified hairs. Male genitalia depressed; basal piece closed, with base narrowed, asymmetrical in most species. Paramera not swivelling on basal piece. Median lobe with lateral appendices *Hemiosus*
- 2'- Mesosternal process laminar at least behind anterior tooth, which may be thickened or hollowed. First apparent urosternite without lateral carinae. Basal pubescence of femora with limit transverse, sinuate or briefly oblique. Protarsi of males tetramerous, at least the basal segment bearing hairs with modified tips. Male genitalia cylindrical or compressed; basal piece open on tergal face, with base always symmetrical in south-American species. Paramera swivelling on basal piece. Median lobe without lateral appendices *Berosus*

1.2.3 The problem of monophyly

This is a wide field of research which has hardly been explored. I have assumed (OLIVA, 1989b) that both *Hemiosus* and *Berosus* are monophyletic, that the first genus represents a lower level of specialization than the second and that *Berosus* originated in South America from an *Hemiosus*-like ancestor. More information is needed to prove or disprove this.

A good case can be made for the monophyly of *Hemiosus*. The genus is restricted to the American continent, with the greater number of species in the Neotropical region. The presence of lateral carinae on the first apparent urosternite is unique among the Berosini, so it may be an autapomorphy. However, it appears just possible that lateral carinae are retained from a primitive state common to several Hydrophiloid stocks (OLIVA, 1992, fig. 115: apparent urosternites of *Hydrochus*). The peculiar femoral

pubescence is quite different from anything found in the other genera of Berosini: it is strongly oblique and very extensive, in most species covering about the basal 3/4 of femora save on anterior edge. This is very probably an autapomorphy. While the shape of the basal piece of the male genitalia, and the paramera which do not swivel on this, are common with *Derallus*, the presence of lateral appendices of the median lobe is exclusive of *Hemiosus* and appears in all the species, so that it should be considered also an autapomorphy.

The case of *Berosus* is more complicated. This genus has a worldwide distribution. I had considered that Mato Grosso in Brazil had been probably the center of speciation (OLIVA, 1989b), since here are found both the greater number of species and the greater diversity of specialization levels. However, some very "*Hemiosus*-like" species appear in Australia. It is fairly safe to accept that the ancestor of the *Berosus*-stock was "*Hemiosus*-like", but there is still not enough information to decide whether that ancestor belonged to the Neotropical fauna. Autapomorphies in *Berosus* appear all related to the sexual function: the tetramerous fore tarsi of males, with modified adhesive hairs at least on the basal segment; the open basal piece of male genitalia, with the paramera articulated to it. There are some remarkable specializations in the genus, but they are not common to all species. On the other hand, there is no positive evidence that Neotropical *Berosus* may be polyphyletic, so for the time being I am working on the assumption that *Berosus* and *Hemiosus* evolved side by side (cf. part 4).

1.3. Specific characters

Diagnostic characters at a specific level are: dorsal sculpture, shape of the mesosternal process, shape of the urosternal carinae, the lateral edges of apparent urosternites (smooth or crenulate) and the male genitalia; to a lesser degree, some details of colouring, specially the extension of apical melanization of maxillary palpi; rarely the shape of claws.

Dorsal sculpture is not uniform: the clypeus is more finely and regularly punctured than the frons; the pronotal disk is usually more finely punctured than the sides; outer elytral striae bear finer punctures than the inner ones, usually also sparser; all the punctures become finer and sparser in the posterior third of the elytra and, to a lesser degree, at the elytral base. Unless otherwise stated, sculpture is described with reference to the pronotal disk, the elytral disk and, for outer striae, the middle part of the elytral length.

The elytral interstriae are of different widths. As a rule, odd-numbered interstriae are wider than even-numbered ones. Therefore, when it is said in a description that interstriae are 3-4 times as wide as striae, it is meant that the second interstria is about 3 times as wide as striae, the third interstria about 4 times. Also, the second interstria broadens at base to accom-

moderate the scutellary stria. Width of interstriae compared with striae is taken behind this part.

In most species the three outer interstriae are narrower and more convex than the inner ones. Frequently, the tenth and eleventh interstriae are raised in part of their length; if this is on the anterior half, they are not, or indistinctly, raised under the humeral hump, unless otherwise stated (cf. *H. moreirai* in key). Elytral apices may be produced in both sexes or only in females, in most species they are rounded. In a single species, *H. monstrosus* sp. nov., there are spine-like hairs on the elytra; they are limited to the outer edge on the posterior 2/3 and they appear only in the females (Fig. 9). In *Berosus*, spine-like hairs appear in many species, in some only on the outer edge of elytra, in others on all the interstriae on the posterior part of the elytra, but always with the same disposition in both sexes.

The mesosternal process varies in shape, both in ventral and in lateral view. In some species the shape of the process is not quite diagnostic, in others there are remarkable differences with other species, obviously good diagnostic characters. The metasternal process is much more uniform than in *Berosus*. The median carina on the first apparent urosternite may be narrow or tabular, and in the last case it may be lowered on the posterior end or not, it may be broadened backwards or not. The bottom of the apical notch of the fifth urosternite may not be produced, or it may bear a pair of teeth, or a single tooth. The lateral edges of the apparent urosternites may be crenulate or smooth; no case has been found of serrate urosternites as in some *Berosus*. The claws are nearly always weakly arched, with a small straight basal tooth, not easily seen. In a few cases, claws are sickle-shaped, either in all the legs (cf. *H. cognatus* in key) or only in fore legs of males. No noticeable modifications of tibial spurs have been found.

The male genitalia give excellent diagnostic characters; they have been taken as a criterium to define species, for instance in case of intra-specific variability of other characters (cf. description of *H. apicalis* sp. nov.). It is important to take into account the length ratio of basal and distal pieces and also of paramera and median lobe. The shape of the paramera, and to a lesser degree of the median lobe, is rather uniform for apparently close species. Some of the species keyed are known only through females and therefore male genitalia are not described.

1.4. The question of subdividing the genus

Armand d'ORCHYMONT (1940) recognized what he called the "phylum" *dejeani*, formed by those species of *Hemiosus* having the pronotum testaceous at least on the lateral and posterior edges. Without stating it, this implied a second "phylum" made up of species answering to the description of *H. maculatus* SHARP, 1882, with pronotum entirely melanic with metallic sheen (except *H. moreirai*; cf. key). Elytral spots are more extensive in species of the *maculatus*-group or "phylum", in which the median carina of the first urosternite is always sharply delimited on the posterior

end, while in species of the *dejeani*-group the carina is gradually lowered backwards and merges with the posterior edge of the urosternite. Finally, in most species of the *maculatus*-group the lateral edges of apparent urosternites are crenulate, while in most species of the *dejeani*-group they are smooth; however, in each group there are some exceptions. This division is convenient, since smaller groups of species are easier to handle, and it would be tempting to erect the groups into subgenera. However, I consider a grave objection the fact that there are no types of genitalia characteristic of each group. Since there are still considerable lacunae in our knowledge of the species of *Hemiosus* in South America (cf. part 4), it is reasonable to think that some species are still unknown to science, and it is quite possible that a species presenting a combination of characters of both groups may be among them. In the light of present knowledge, I do not consider it prudent to establish subgenera.

1.5. Biological data

The available data show a restricted distribution for many of the species, but it is possible that this relates to a deficiency in sampling techniques. Much of the material studied in this and former papers came from random drag-net sampling or from light-trap captures.

When the habitat is known, the species of *Hemiosus* are associated with sandy bottoms (FITTKAU, collecting data; OLIVA, personal observation). This association may restrict the dispersion of the species along a river (cf. part 4).

In nature, individuals of *H. bruchi* KNISCH, 1924 have been found in marginal pools of mountain streams in Córdoba (Central Argentina), and individuals of *H. sculptipennis* sp. nov. on stream pools with bottom of fine white sand or in the submerged part of sand banks of the same type, in Entre Ríos (eastern Argentina) (OLIVA, pers. obs.). The beetles stay half sunk into the bottom, with the head outside; the part in view has cryptic colouring, in *H. bruchi* because of the large melanic spots, in *H. sculptipennis* because of the pale testaceous areas, "broken up" by small melanic spots. When alarmed, they swim away and then quickly sink again into the bottom. No observations have been made at night, but material of *H. bacchusi* sp. nov., of *H. multimaculatus* (JENSEN-HAARUP, 1910), of *H. hapalus* SPANGLER, 1966 and of *H. funditus* SPANGLER, 1966 has been collected at light-traps. The type material of *H. fittkau* and *H. monstrosus* spp. nov. has been collected from a sand bank according to FITTKAU's labels. ORCHYMONT (1940) mentions *H. morlestus* "dans le sable du rivage" (p. 177). *H. mulvianus* ORCHYMONT has been collected by SCHUBART in "Hochwasser resttumpel Characeen" (cf. OLIVA, 1991; there is an error in the transcription). A specimen of *H. dejeani* from the British Museum, from Argentina: Neuquén: río Aluminé, bears the label "on weed". A large series of the same species has been collected by BACHMANN in Argentina: Río Negro: General Roca, in marginal pools without much weed-growth (cf. OLIVA, 1987).

2. Materials and methods

2.1 Material examined and deposit of types

Material collected by the author or by other members of the work group directed by Dr A.O. BACHMANN: Holotypes and allotypes have been deposited at the Museo argentino de Ciencias naturales "Bernardino Rivadavia" (MACN).

Material collected by Dr E. J. FITTKAU in Brazil, during an expedition by the Max-Planck-Institut and the Instituto de Pesquisas da Amazonia (INPA). Holotypes and allotypes are deposited in the Museu de Zoologia da Universidade de Sao Paulo (MZUSP), as a deposit for the INPA.

Undetermined material from the Natural History Museum (London), formerly known as British Museum (BM). Holotypes and allotypes are deposited in the same institution.

Material from the Muséum d'Histoire naturelle, Genève, Switzerland: Two paratypes, deposited in the same institution.

Whenever possible, paratypes have been deposited also at the National Museum of Natural History (NMNH), Washington, USA, and at the Zoologische Staatssammlung Bayerns (ZSB), München, Republic of Germany.

To map localities of known species, material of the MACN was examined. Information from OLIVA, 1987, 1989a, 1991, was incorporated.

2.2 Methods

The methods used were the usual for this type of study. Dry specimens were relaxed in hot water for dissection. Material personally collected by the author was preserved in isopropanol; type-series of new species were dry-mounted later. Dissected genitalia were kept in glycerol in plastic tubes sealed with heat and attached to the same pin as the specimen. To make these tubes, catheter tube 2 mm in diameter was used. Treatment with alkali was not used, and it is not recommended because it may distort the genitalia.

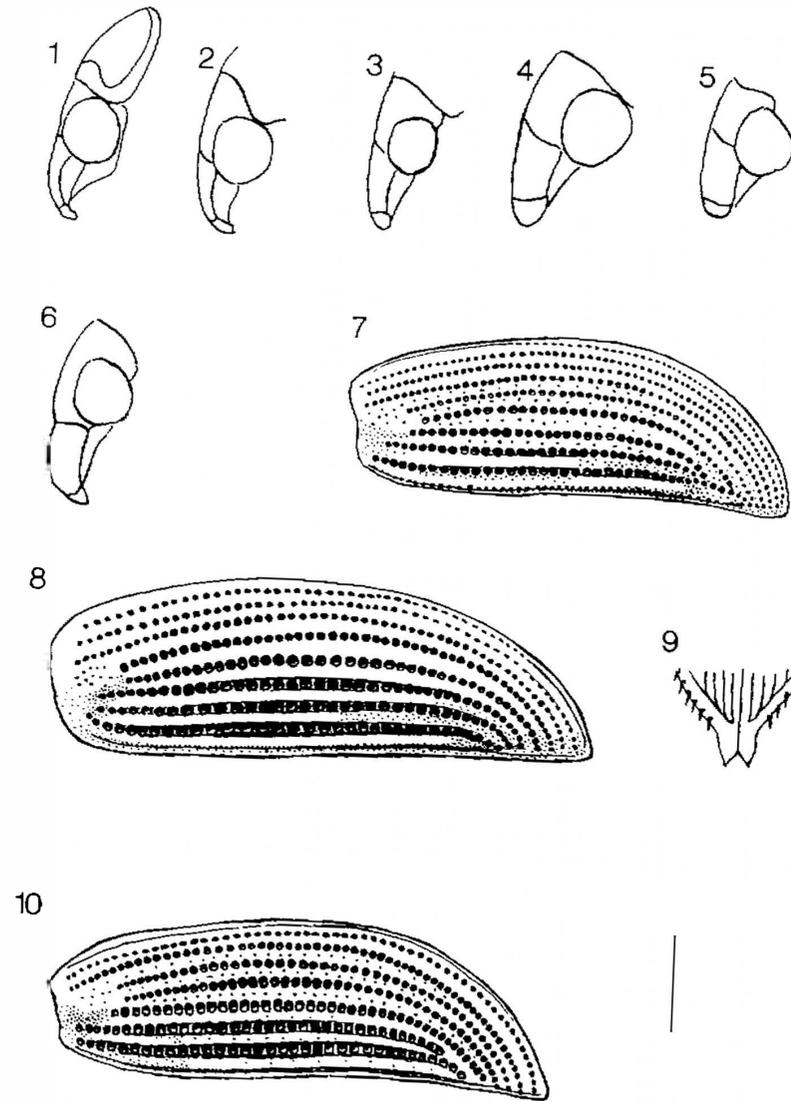
3. Systematic part

3.1. Key to the species of *Hemiosus* in South America

- 1- Pronotum entirely melanic, with metallic sheen, at most with anterior angles testaceous. First apparent urosternite with median carina tabular, broad or narrow, flat or slightly lowered backwards, but always ending in a definite margin on the posterior edge of the sternite (*maculatus*-group) 2

- 1'- Pronotum testaceous at least on posterior edge and angles; if there is an extensive area with metallic sheen, the limit with the testaceous area is well defined. First urosternite with median carina fine or shaped as an inverted Y, nearly always with posterior end lowered and fused gradually into the sternite (*dejeani*-group) 11
- 2- Pronotum with anterior angles diffusely testaceous. Interstria 10th distinctly raised under humeral hump. Length over 2.5 mm
. *H. moreirai* ORCHYMONT, 1921
(Brazil: (SE) Rio de Janeiro)
- 2'- Pronotum entirely melanic. Interstria 10th not (or indistinctly) raised under humeral hump 3
- 3- Pronotum narrower than elytral bases. Inner interstriae flat, outer ones convex, 10th and 11th raised in anterior half. Lateral edges of urosternites smooth under 50 ×. Length about 2.80 mm
. *H. regalis* KNISCH, 1922
(Brazil: (S) Santa Catharina)
- 3'- Pronotum as broad as elytral bases 4
- 4- Inner elytral striae with square punctures, coarser around scutellum so that interstriae are narrower there (fide ORCHYMONT, 1940)
. *H. variegatus* (BOHEMAN, 1858)
(Brasil: (SE) Rio de Janeiro. Not seen)
- 4'- Inner striae with round punctures, not coarser around scutellum; inner interstriae not narrowed around scutellum 5
- 5- Pronotal punctures polygonal or elliptic, very coarse (4-6 times the size of ommatidia). Inner interstriae as wide as striae, outer ones narrower, 10th and 11th raised in anterior 3/4. Length around 2.80 mm
. *H. interimus* MOUCHAMPS, 1963
(Bolivia: (Santa Cruz: E) Roboré)
- 5'- Punctures on pronotum fine (1-2 ommatidia) to moderately coarse (3-4 ommatidia). Inner interstriae at least a little wider than striae 6
- 6- Median carina of first urosternite broad, not lowered backwards. Apical notch of fifth urosternite with bottom always produced into a triangular tooth 7
- 6'- Median carina of first urosternite narrowly tabular, if broadened at posterior end, lowered there. Bottom of apical notch varying 8
- 7- Punctures on outer striae round. Inner interstriae more than 2 times as wide as striae; outer interstriae about as wide as striae, 10th and 11th raised on anterior half. Size large (length of female holotype: 3.50 mm)
. *H. bruchi* KNISCH, 1924
(Argentina: NW and Center; Bolivia: (SE) Tarija; Paraguay: (E Center) San Pedro)

- 7'- Punctures on outer striae squarish. Inner interstriae 1.5-2 times as wide as striae; outer interstriae narrower than striae, 10th and 11th raised in anterior 3/4. Size moderately large (length of holotype: 3.06 mm) *H. varidius* ORCHYMONT, 1940 (Brazil: (E) Pernambuco)
- 8- Median carina of first urosternite narrow, hardly broadening backwards. Size moderate 9
- 8'- Median carina strongly broadened backwards, lowered on posterior end (Y-shaped under slanting light) 10
- 9- Pronotal punctures 3-4 times the size of ommatidia, contiguous. Inner interstriae hardly wider than striae, interstriae 10th and 11th raised in anterior half. Apical notch with bottom not produced. Length of allotype: 2.44 mm *H. schindleri* MOUCHAMPS, 1963 (Bolivia: (Cochabamba: Center): Chapare)
- 9'- Pronotal punctures 2 times the size of ommatidia, dense. Inner interstriae 1-2 times as wide as striae; interstriae 10th and 11th raised in anterior 3/4. Apical notch with bottom produced into a triangular tooth. Length of male holotype: 2.40 mm. Male genitalia as in fig. 21 *H. aequatorialis* sp. nov. (Venezuela: (W) Táchira; Perú: (N) Túmbez)
- 10- Size rather large (length of male holotype: 3.0 mm). Lateral edges of pronotum smooth. Outer interstriae about as wide as striae, 11th raised on nearly all its length. Mesosternal process with posterior half (in ventral view) rounded behind (Fig. 12). Apical notch with bottom produced into a triangular tooth. Lateral edges of urosternites very finely crenulate. Male genitalia as in fig. 22 *H. irinus* sp. nov. (Argentina: (NE) Misiones)
- 10'- Size moderate (length of measured paratype: 2.31 mm). Lateral edge of pronotum crenulate. Outer interstriae narrower than striae, 11th raised between 1/3 and 3/4 of length. Mesosternal process with posterior half (in ventral view) subrectangular. Apical notch of fifth urosternite with bottom produced into a bifid tooth. Lateral edges of basal urosternites finely crenulate, of fifth coarsely so. Basal piece a little shorter than half of total length. Paramera narrow, weakly sinuate. Median lobe much shorter than paramera; appendices acuminate *H. maculatus* SHARP, 1882 (Guatemala; included for comparison)



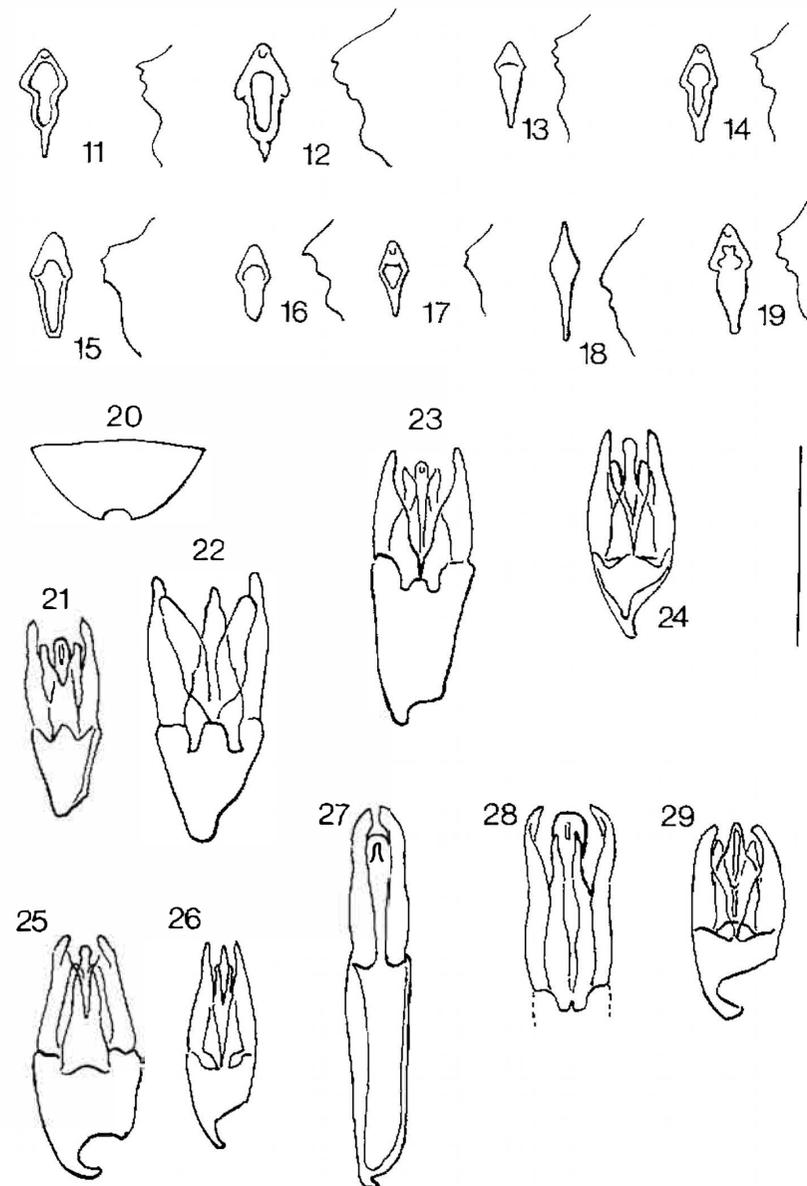
Figs 1-10. 1: *Hemiosus apicalis* sp. nov., head and pronotum in lateral view: head profile convex, labrum directed backwards; 2: *H. costalis* sp. nov., convex profile; 3: *H. fitkai* sp. nov., flattened head profile, labrum directed downwards; 4: *H. monstrosus* sp. nov., flattened profile; 5: *H. punctipennis* sp. nov., flattened profile; 6: *H. sculptipennis* sp. nov., convex profile; 7: *H. apicalis* (male), elytron in lateral view; 8: *H. costalis*, ditto; 9: *H. monstrosus* (female), elytral apices in dorsal view; 10: *H. sculptipennis*, elytron in lateral view. All figures 50 ×. Scale line: 0.5 mm.

- 11- Profile of head flat; labrum pointing downwards (Figs 3, 4, 5) . . . 12
 11'- Profile of head convex; labrum pointing backwards (Figs 1, 2, 6). .15
- 12- Head and pronotum not reticulate. Mesosternal process with anterior tooth curved, more strongly raised than the rest of the process (Fig. 16). Length of holotype: 2.50 mm. Male genitalia as in fig. 26
 *H. fitkai* sp. nov.
 (Brasil: Amazonas)
- 12'- Head and pronotum reticulate. Anterior tooth of mesosternal process not more prominent than following projection 13
- 13- Pronotal sides with coarser and denser punctures than disk. Elytral apices produced into large triangles, narrowed at base (Fig. 9). Females with spine-like hairs on outer elytral edge. Fifth urosternite with shallow semicircular apical notch (Fig. 20). Male genitalia as in fig. 27 *H. monstrosus* sp. nov.
 (Brasil: Amazonas)
- 13'- Pronotal punctures fine to obsolete. Elytral apices not, or slightly, produced. Females without spine-like hairs. Apical notch of fifth urosternite broad, straight, with bottom arcuate 14
- 14- Length under 2 mm. Tenth stria obsolete. Outer interstriae flat. Elytral apices not produced. Paramera with apices abruptly narrowed and turned outwards (under great magnification). Median lobe narrowly rounded at apex *H. laevicollis* OLIVA 1994
 (Venezuela: (SE) Bolívar)
- 14'- Length over 2 mm (holotype: 2.40 mm). Tenth stria sharply incised. Outer interstriae convex, 9th raised on anterior half, 11th raised on posterior half. Elytral apices narrow, slightly produced. Paramera with apices slightly turned inwards, acute. Median lobe broadly rounded at apex (Fig. 28) *H. punctipennis* sp. nov.
 (Uruguay: (N) Artigas)
- 15- Punctures on outer interstriae nearly as large as those on striae. Mesosternal process not broadened, raised to the same level than metasternal process. Apical notch with bottom bidentate, teeth contiguous in males, separate in females. Length over 3.0 mm
 *H. dejeani* (SOLIER, 1849)
 (Chile, Center and S; Argentina: (N of Patagonia) Río Negro, Neuquén)
- 15'- Punctures on outer interstriae much smaller than those on striae, sometimes obsolete. At least anterior half of mesosternal process raised with respect to metasternal process. No sex dimorphism in apical notch 16
- 16- Punctures on pronotal disk contiguous, coarse (4 ommatidia or more). Lateral edges of urosternites distinctly crenulate 17
- 16'- Punctures on pronotal disk moderate to fine, sometimes coarse only

- on pronotal sides; if punctures are coarse on disk, then they are sparse (cf. *H. mornarius*). Lateral edges of urosternites smooth (or microscopically crenulate; cf. *H. costalis*) 18
- 17- Mesosternal process (ventral view) shaped as a short rhomboid. Median carina of first urosternite Y-shaped. Apical notch of fifth urosternite with bottom produced into a tooth, bifid at apex. Lateral edges of urosternites coarsely crenulate. Claws sickle-shaped. Length of holotype: 2.62 mm *H. cognatus* (KNISCH, 1921)
 (Brazil: Matto Grosso; Paraguay: (E) San Pedro; Venezuela: (W) Táchira)
- 17'- Mesosternal process (ventral view) shaped as a long, narrow rhomboid. Median carina of first urosternite narrow, tapering backwards. Apical notch with bottom produced into a triangular tooth. Lateral edges of urosternites finely crenulate. Claws weakly arched. Length of holotype: 2.31 mm *H. tenembaumi* (ORCHYMONT, 1937)
 (Brasil: (Parana: S); Morretes)
- 18- Punctures on inner striae as large as pronotal ones. Interstriae broad, flat, the outer ones slightly convex, 11th a little more so, not raised. Mesosternal process in ventral view with anterior half triangular, posterior narrow. Length: 2.7-3.5 mm
 *H. multimaculatus* (JENSEN-HAARUP, 1910)
 (Argentina: W, NW; Chile: (N) Tarapacá; Bolivia: (SE) Tarija)
- 18'- Punctures on inner striae distinctly coarser than pronotal ones. At least part of interstria 10th or 11th raised 19
- 19- Length about 3 mm. Inner interstriae 3-4 times as wide as striae. Only interstria 10th raised on posterior half. Mesosternal process with posterior half only a little less strongly raised than anterior half
 *H. hartmanni* MOUCHAMPS, 1957
 (Perú: (SE) Cuzco)
- 19'- Length rarely over 2.5 mm (cf. *H. funditus*). Interstriae 10th and 11th raised; if only 10th raised, then length under 2 mm 20
- 20- Length under 2 mm. Elytra with basal hump, concave behind scutellum. Interstria 10th raised, 11th not so
 *H. mornax* ORCHYMONT, 1940
 (Brazil: (E) Pernambuco)
- 20'- Length over 2.0 mm. Elytra without basal hump. Interstria 11th raised at least in part 21
- 21- Pronotal punctures fine (about the size of an ommatidion). Elytral apices of females slightly produced 22
- 21'- Pronotal punctures at least twice as large as ommatidia. Elytral apices of females not produced 24

- 22- Interstria 10th raised between humeral hump and the middle of elytron; interstria 11th raised on posterior half (Fig. 7). Apical notch of fifth urosternite with bottom produced into a bifid tooth. Maxillary palpi with distal segment melanic in apical 1/3-1/2. Length of male holotype: 2.50 mm. Male genitalia as in fig. 23 *H. apicalis* sp. nov.
 (Argentina: (NE) Misiones; Uruguay: (S Center) Lavalleja)
- 22'- Interstriae 10th and 11th raised in anterior 3/4 of elytron. Apical notch of fifth urosternite with bottom hardly produced 23
- 23- Mesosternal process with anterior half only a little more strongly raised than posterior half. Distal segment of maxillary palpi dark only at apex. Length about 2.60 mm *H. mulvianus* ORCHYMONT, 1940
 (Brazil: (E) Pernambuco)
- 23'- Mesosternal process with anterior half much more strongly raised than posterior half. Distal segment of maxillary palpi dark on apical half. Length about 2.10 mm *H. dimorphus* ORCHYMONT, 1940
 (Brazil: (SE) Rio de Janeiro, (S) S. Catharina)
- 24- Striae 1st, 2nd and scutellary obsolete at base. Punctures on inner interstriae nearly as large as those on striae. Median carina of first urosternite slightly broadened backwards; urosternites 2nd to 4th without carinae. Length of holotype: 2.50 mm *H. morlestus* ORCHYMONT, 1940
 (Brazil: (E) Pernambuco)
- 24'- Inner striae not obsolete at base. Punctures of inner interstriae half the size of those on striae or finer. At least urosternites 2nd and 3rd with vestigial carinae 25
- 25- Inner interstriae broad (3-4 times as wide as striae). Interstriae 9th, 10th and 11th raised in anterior 3/4. Y-shaped carinae on three first apparent urosternites. Length of holotype: 2.60 mm *H. hapalus* SPANGLER, 1966
 (Perú: (NE) Tingo María; Bolivia: (SE) Tarija)
- 25'- Inner interstriae more or less narrow (2nd not more than 2 times as wide as striae) 26

Figs 11-29. 11: *H. aequatorialis* sp. nov., mesosternal process: ventral view (left) and lateral view; 12: *H. irinus* sp. nov., ditto; 13: *H. apicalis*, ditto; 14: *H. bacchusi* sp. nov., ditto; 15: *H. costalis*, ditto; 16: *H. fitkaii*, ditto; 17: *H. monstrosus*, ditto; 18: *H. punctipennis*, ditto; 19: *H. sculptipennis*, ditto; 20: *H. monstrosus*, fifth urosternite; 21: *H. aequatorialis*, male genitalia; 22: *H. irinus*, ditto; 23: *H. apicalis*, ditto; 24: *H. bacchusi*, ditto; 25: *H. costalis*, ditto; 26: *H. fitkaii*, ditto; 27: *H. monstrosus*, ditto; 28: *H. punctipennis*, ditto (basal piece omitted); 29: *H. sculptipennis*, ditto. All the figures 100 ×. Scale line: 0.5 mm.



- 26- Second interstria 1.5 times as wide as striae 27
 26'- Second interstria 2 times as wide as striae 28
- 27- Pronotal punctures coarse and sparse. Outer interstriae as wide as striae. Mesosternal process with anterior half strongly raised, posterior half weakly raised. Apical notch with bottom produced into a triangular tooth. Length of holotype: 2.87 mm
 *H. mornarius* ORCHYMONT, 1940
 (Brazil: (E) Pernambuco, Amazonas)
- 27'- Punctures on pronotal disk rather or quite fine (1-2 ommatidia), dense (spaces not, or hardly, greater than the diameter of punctures); punctures on sides coarse, contiguous. Outer interstriae narrower than striae. Mesosternal process with both anterior and posterior half strongly raised (Fig. 19). Apical notch with bottom produced into a pair of blunt, contiguous teeth. Length of male holotype: 2.70 mm. Male genitalia as in fig. 29 *H. sculptipennis* sp. nov.
 (Argentina: (E Center) Entre Ríos)
- 28- Posterior half of mesosternal process very strongly raised and dilated. Median carina of first urosternite and basal carinae on 2nd and 3rd narrow, tapering backwards. Length of holotype: 3.20 mm
 *H. funditus* SPANGLER, 1966
 (Perú: (NE) Tingo María; Bolivia: (SE) Tarija; Venezuela: (W) Táchira)
- 28'- Posterior half of mesosternal process weakly raised (Figs 14, 15). Median carina of first urosternite tabular or Y-shaped, not tapering backwards 29
- 29- Inner interstriae with moderately coarse punctures (1/4 of those on striae). Interstria 11th 1.5-2 times as wide as striae; interstria 9th raised in anterior 2/3. Median carina of first urosternite Y-shaped. Apical notch with bottom produced into a blunt tooth. Lateral edges of urosternites smooth. Length of male holotype: 2.30 mm. Male genitalia as in fig. 24 *H. bacchusi* sp. nov.
 (Venezuela: (W) Táchira)
- 29'- Punctures on inner interstriae fine (some not more than 1/6 of punctures on striae). Interstria 11th slightly narrower than striae (Fig. 8). Interstria 9th not raised. Median carina of first urosternite narrowly tabular. Apical notch with bottom hardly produced. Lateral edges of urosternites microscopically crenulate. Length of male holotype: 2.90 mm. Male genitalia as in fig. 25 *H. costalis* sp. nov.
 (Brazil: Amazonas)

(See 3.3.1. for additional data about species other than the new ones)

3.2 Description of new species

3.2.1. Species with melanic pronotum

Hemiosus aequatorialis sp. nov.
 (Figs 11, 21)

Length of male holotype: 2.40 mm.

Head, pronotum and scutellum black with metallic sheen, bluish green and purple. Elytra testaceous with extensive black spots which have a metallic iridescence. In some specimens the spots take up nearly the whole elytron. Sternites black. Pubescent part of femora black, the rest of the legs testaceous. Distal segment of maxillary palpi dark at apex.

Head and pronotum with moderate-sized to fine, contiguous punctures, on pronotal disk twice as large as ommatidia, polygonal. Ground finely, moderately densely, deeply punctulate. Median line not punctured, but punctulate. Postero-lateral pits equivalent to 5-6 punctures. Lateral edges of pronotum finely crenulate. Scutellum with two rows of punctures, finer than the pronotal ones. Inner elytral striae with irregular punctures, one and a half to three times as large as pronotal ones, at base round, contiguous, in the first 1/4 of the elytron spaced by the equivalent of their diameter, from 1/4 to 1/2 of elytron contiguous, squarish, up to four times as large as pronotal ones. Outer striae with round punctures, 2-4 times as large as pronotal ones, only between 1/2 and 3/4 of length tending to a square shape. Inner interstriae as wide as striae or a little wider, slightly convex, with punctures half the size of pronotal ones, in a single row save on third interstria. Outer interstriae narrower than striae (11th as wide as tenth stria between 1/4 and 1/2 of length), convex, 10th and 11th raised in anterior 3/4, only 10th indistinctly raised under humeral hump (by no means comparable with *H. moreirai*; cf. key).

Anterior half of mesosternal process strongly raised, with two projections behind the straight anterior tooth, all three equally prominent (Fig. 11); posterior half separately, more weakly raised. In ventral view, anterior half dilated into a triangle, posterior half more weakly dilated, gradually narrowing backwards (Fig. 11). First apparent urosternite with median carina narrowly tabular, hardly broadening backwards, a little lowered on posterior end; lateral carinae narrow, broadening backwards, 3/4 of the length of the sternite. Urosternites 2nd to 4th with vestigial carinae. Apical notch of fifth urosternite with bottom produced into a triangular tooth. Lateral edges of urosternites finely crenulate. Femoral pubescence moderately extensive.

Male genitalia (Fig. 21): Basal piece a little shorter than half of total length, slightly asymmetrical at base. Paramera gradually acuminate, blunt at apices. Median lobe subcylindrical, broadly rounded at apex, shorter

than paramera; appendices broad, lanceolate, about as long as median lobe.

Material examined: From Venezuela: estado de Táchira: Santo Domingo: Finca Santa Rosa, 330 m, 15.I.1983 ("light-trap"), leg. D. HAVRANEK, material from the BM. Male holotype, allotype, one male paratype and three female paratypes in the BM; one male paratype and three female paratypes in the MACN.

A male from the BM which I examined in 1990, labelled "N.Perou/Prov.Túmbez/Grau/C.A.Baer", "Coll. H. Paschet", "Coll. A. d'Orchymont" (cf. OLIVA, 1991, under *H. maculatus*) belongs undoubtedly to this species. I have among my notes a drawing of the dry-mounted genitalia, showing the gradually acuminate paramera, the median lobe shorter than the paramera, but not as short as in *H. maculatus*, and the short basal piece, slightly asymmetrical at base, all characteristic of *H. aequatorialis* sp. nov. I did not then examine the sternal characters.

Etymology: from latin *aequator*, *-ris*, the equatorial line, in the adjectival form *aequatorialis*, *-e*, "aequatorial", alluding to the geographic distribution of the new species.

Discussion: The new species can be distinguished from *H. irinus* sp. nov. by the slightly coarser pronotal sculpture, with fine, moderately dense punctulation, by the narrowly tabular median carina on the first urosternite, by the basal piece of male genitalia, longer than in *H. irinus* (a little shorter than half of the whole), and by the median lobe shorter than the paramera and broadly rounded at apex.

H. aequatorialis differs from *H. maculatus*, which it strongly resembles, by the shape of the mesosternal process in ventral view (the posterior half is gradually narrowed backwards, while in *H. maculatus* it is truncated), by the median carina of the first urosternite, which in *H. maculatus* is broadened and lowered backwards, by the bottom of the apical notch produced into a triangular tooth (in *H. maculatus* this is bifid), by the lateral edges of apparent urosternites finely crenulate, by the basal piece of male genitalia which is shorter and less markedly asymmetrical at base, by the paramera with rather blunt apices and by the median lobe which is distinctly shorter in *H. maculatus*.

The new species differs from *H. regalis* by the pronotum as wide as elytral bases; from *H. moreirai* by the lack of testaceous areas on the pronotum, by the coarsely punctured inner striae and by the tenth interstria only indistinctly raised under humeral hump. The species *H. bruchi*, *H. interimus*, *H. schindleri*, *H. varidius* and *H. variegatus* all have coarser pronotal punctures than *H. aequatorialis*.

Hemiosus irinus sp. nov.
(Figs 12, 22)

Length of male holotype: 3.0 mm.

Head, pronotum and scutellum black with strong metallic iridescence. Elytra testaceous with extensive black spots, inside which the bottom of punctures is iridescent. Sternites and pubescent part of femora black, the rest of the legs testaceous. Distal segment of maxillary palpi dark in apical 1/4.

Head and pronotum with fine punctures (on clypeus as large as ommatidia, on frons and pronotal disk a little larger). Spaces equal to puncture diameter. Ground coarsely, sparsely punctulate. Postero-lateral pits deep, well-defined, 3-4 times the size of punctures. Lateral edges of pronotum entire, with a row of deep punctures. Scutellum densely punctured. Elytral striae fine, on base and on distal third with punctures twice as large as those on pronotum, with spaces equal to diameters; striae 2nd to 6th behind base, and outer striae, with round punctures 3-4 times as large as those on pronotum, contiguous. Inner interstriae 1-2 times as wide as striae, flat, with punctures 1/3 to 1/4 of the size of punctures on striae at base. Outer interstriae (including 8th) as wide as striae, convex, 10th raised in anterior half of elytron, 11th raised between 1/4 and 5/6 of elytron. Punctures on outer interstriae about 1/6 of those on striae, or smaller. Elytral edge coarsely punctured, under humeral hump almost as coarsely as 10th stria. Elytral apices rounded together.

Mesosternal process weakly raised, in ventral view sagittate, with posterior half narrowing gradually backwards (Fig. 12). In lateral view there is a weak, curved anterior tooth, followed by a strong projection, behind this a weaker one; posterior half of the process separately raised, a little less strongly than anterior one (Fig. 12). First apparent urosternite with median carina flat, broadening and lowered backwards; lateral carinae flat, broadening strongly backwards, about 2/3 of the length of the sternite. Urosternites 2nd to 4th with vestigial carinae which are hard to see. Fifth urosternite with bottom of apical notch produced into a triangular tooth. Lateral edges finely crenulate (they appear smooth under magnifications smaller than 50 ×). Pubescence of hind femora covering basal 1/2 on anterior edge and 4/5 on posterior edge.

Male genitalia (Fig. 22): Basal piece short, about 2/5 of total length, nearly triangular, only weakly emarginate in basal half. Paramera gradually acuminate; apices narrowly rounded. Median lobe subconical, nearly as long as paramera, rounded and narrowed at apex; appendices broad, blunt at apices, as long as median lobe.

Material examined: From Argentina: provincia de Misiones: Bernardo de Irigoyen: Establecimiento Intercontinental, on the arroyo Urugua-í, XI.1986, leg. J.F. GENISE. Male holotype, allotype, 4 male paratypes and

6 female paratypes at the MACN. One male paratype at the ZSB, one at the BM, one at the NMNH, one at the MZUSP.

Etymology: from latin *irinus*, -a, -um, "iridescent".

Discussion: This species can be recognized by the fine pronotal sculpture, which distinguishes it from *H. aequatorialis* sp. nov., and *a fortiori* from those species having a coarse pronotal sculpture: see discussion of *H. aequatorialis* for those species and also for *H. regalis* and *H. moreirai*.

The new species resembles *H. maculatus*, from which it can be distinguished by the smooth lateral edges of the pronotum, by the posterior half of the mesosternal process (not truncated behind in ventral view), by the bottom of the apical notch with a triangular, not a bifid tooth, by the very fine crenulation of lateral edges in all apparent urosternites; regarding male genitalia, by the shorter basal piece, the paramera not sinuate and with blunter apices, and the median lobe as long as paramera, narrowed at apex and with appendices broader and blunter than in *H. maculatus*.

3.2.2. Species with testaceous pronotum

Hemiosus apicalis sp. nov.
(Figs 1, 7, 13, 23)

Length of male holotype: 2.50 mm.

Head and scutellum melanic with strong metallic sheen. Pronotum testaceous with a discal melanic spot (without testaceous median line), including middle part of anterior edge of pronotum. In material from Misiones (Argentina) the spot takes up the whole of the pronotum save lateral edges and anterior angles, and it has a metallic sheen, weaker than that on head, most apparent at bottom of punctures. In material from Uruguay there is a discal reddish spot and the anterior edge of the pronotum is blackish; there is no metallic sheen. Elytra testaceous, with small melanic spots without metallic sheen. Sternites black. Femora diffusely dark on base. Distal segment of maxillary palpi dark in apical 1/3 to 1/2.

Profile of head convex; labrum directed backwards (Fig. 1). Head and pronotal disk with fine punctures (as large as ommatidia), on head dense, irregular, rather polygonal on frons, on pronotal disk sparse. Pronotal sides with dense punctures 2-3 times the size of ommatidia. There is a narrow, flat, unpunctured median band. Pronotal ground smooth, sparsely and finely, but deeply, punctulate. Postero-lateral pits rudimentary. Lateral edges of pronotum smooth. Inner elytral striae with round punctures about twice the size of pronotal ones, with spaces equivalent to 0.5-1 diameter. Outer striae with contiguous round punctures, 2-3 times the size of those on pronotum. Punctures not enlarged on lateral spot. Inner interstriae 2-2.5 times as wide as striae, slightly convex, with punctures about 1/3 of the size of those on striae, placed in a row. Outer interstriae one and a half times as wide as striae, convex, with fine and sparse, but deep, punctures;

10th more strongly raised than 11th on anterior half, 11th raised between middle of elytron and 3/4, before the middle broader than 10th (Fig. 7). Elytral apices of males narrowed, of females produced into small triangles, acute.

Mesosternal process (lateral view) with straight anterior tooth, followed by a stronger projection (Fig. 13) and this by a weaker one; posterior half separately raised, only a little less strongly than anterior one. Process in ventral view shaped as a moderately narrow rhomboid (Fig. 13). First urosternite with narrow carinae, weakly broadened backwards, the median one rather sharp save at the flattened, lowered posterior end; lateral carinae 3/4 of length of sternite. Second urosternite with a carina shaped as an inverted Y, 2/3 of the length of the sternite, not easily observed in all the specimens. Apical notch of fifth urosternite with bottom produced into a deeply bifid tooth with blunt points. Pubescence of hind femora covering basal 1/2 to 3/4.

Male genitalia (Fig. 23): Basal piece long (about 3/5 of total length), with shallow, transverse curved emargination at base. Paramera gradually acuminate, with outer edge convex and inner edge sinuate, so that the narrowly rounded apices appear a little turned inwards. Median lobe pear-shaped, narrowly rounded at apex, slightly shorter than paramera; appendices lanceolate, a little shorter than median lobe.

Material examined: From Argentina: provincia de Misiones: Bernardo de Irigoyen: Establecimiento Intercontinental, on arroyo Uruguay-í, XI.1986 leg. J.F. GENISE. Male holotype, allotype, 5 male paratypes and 4 female paratypes at the MACN; a female paratype at the ZSB, one at the BM, one at the NMNH. From Misiones, arr. Uruguay-í, left shore, 17.II.1986, leg. S. MONTANELLI, one paratype of each sex at the MZUSP; 8 male paratypes and 4 female paratypes at the MACN; besides, some specimens in isopropanol reserved for anatomical studies. From Argentina: Misiones: Iguazú, XII.1986 leg. R. FOERSTER, two paratypes, a male and a female, at the Musée d'Histoire naturelle de Genève (Switzerland). From Uruguay: departamento de Lavalleja: Minas: arroyo El Perdido, 19.XII.1981, leg. A. OLIVA: 6 male paratypes and 9 females, at the MACN.

Etymology: from latin *apex*, -icis, "tip", in the adjectival form, alluding to the extensive apical melanization of the maxillary palpi and to the produced elytral apices of the females.

Discussion: This species can be recognized by the raised parts of the outer interstriae: 10th raised on anterior half and 11th on posterior half. Besides, the fine sculpture of the pronotal disk and the produced elytral apices of females set it apart from all other species save *H. mulvianus* and *H. dimorphus*. *H. apicalis* sp. nov. differs from the first by: punctures of outer striae not enlarged on lateral spot, lateral edge of pronotum not crenulate, apical notch of fifth urosternite with bifid tooth and distal segment of maxillary palpi dark in apical 1/3-1/2. It differs from *H. dimorphus* by: femora only diffusely darkened at base, elytral apices of females

acute, not rounded, inner interstriae slightly convex, interstria 11th raised only on posterior half, mesosternal process with anterior half hardly more strongly raised than the posterior half and apical notch with bottom produced into a bifid tooth. The material from Misiones has metallic sheen on the extensive pronotal spot, a condition like that of the holotype of *H. dimorphus*. Yet this sheen is absent in the material from Uruguay. It is interesting that these three species, all having the same type of sculpture and produced elytral apices in females, share a model of male genitalia in which the basal piece is remarkably long compared with that of other species with testaceous pronotum.

Hemiosus bacchusi sp. nov.
(Figs 14, 24)

Length of male holotype: 2.30 mm.

Head, para-medial spots on pronotum and scutellum melanic with strong metallic sheen. Lateral spots of pronotum without metallic sheen. Elytra testaceous, with small melanic spots without metallic sheen. Sternites black. Femora diffusely dark at base. Distal segment of maxillary palpi dark on distal 1/3.

Profile of head convex. Head with dense punctures, on clypeus as large as ommatidia, on frons coarser and denser. Pronotum with irregularly distributed punctures: on para-medial spots slightly larger than ommatidia, moderately dense; on sides twice the size of ommatidia, with very irregular spaces. Ground punctulate. Narrow median unpunctured band, punctular edges of pronotum marginate, with a row of coarse dense punctures. Scutellum with several punctures, finer than on pronotal disk. Elytral striae with coarse punctures, on inner striae twice the size of pronotal ones, on outer striae 3-4 times the size of pronotal ones. Inner interstriae flat, twice as wide as striae, with punctures 1/4 of those on striae, placed in one row save on 3rd interstria. Outer interstriae convex, narrow; 9th on anterior half one and a half times as wide as striae, 9th on posterior half and 10th slightly narrower than striae, 11th one and a half to two times as wide as striae, strongly margined. Interstriae 9th raised on anterior 2/3 of elytron, 10th on anterior half, 11th from 1/4 to 5/6. Punctures on outer interstriae very fine but evident. Elytral apices narrow.

Mesosternal process: in lateral view with anterior half strongly raised, with prominent anterior tooth, followed by two rather weaker projections; posterior half rather strongly raised (Fig. 14); in ventral view the process sagittate, moderately narrow. Urosternites with Y-shaped carinae: in first, lateral carinae 3/4 of the length of sternite; on second carina half as long as sternite; on third a vestigial carina; no carina observed on fourth. Apical notch of fifth urosternite with bottom produced into a blunt tooth. Lateral edges of urosternites smooth. Femoral pubescence not extensive: nearly distal 1/3 of hind femora glabrous.

Male genitalia (Fig. 24): Basal piece very short, with deep curved emargination on basal half. Paramera gradually acuminate; apices straight, but appearing slightly turned inwards because of convex outer edge. Median lobe bottle-shaped, a little shorter than paramera, swollen and rounded at apex; appendices broadly acuminate, a little shorter than median lobe.

Material examined: From Venezuela: Estado de Táchira: Santo Domingo: Finca Santa Rosa, 330 m, 15.I.1983, "light-trap", leg. D. HAVRANEK. Male holotype, allotype, 2 male paratypes and 5 female paratypes at the BM; 2 male paratypes and 3 female paratypes at the MACN; one female paratype at the ZSB, one at the NMNH, one at the MZUSP.

Etymology: I dedicate this species to Michael E. BACCHUS, for many years curator of Coleoptera at the BM, who arranged the loan of the material among which the new species was found.

Discussion: This species can be recognized by the moderately narrow inner interstriae and by the interstria 11th raised between 1/4 and 5/6 of the length of the elytron. *H. bacchusi* sp. nov. differs from *H. costalis* sp. nov. by the 11th interstria wider than striae (in *H. costalis* it is narrower) and by the male genitalia (see fig. 24, 25). *H. bacchusi* differs from *H. fitzkau* sp. nov. by the convex profile of head (see fig. 3), by the presence of para-medial spots and of an unpunctured median line on the pronotum, by the narrower inner interstriae, by the interstria 8th convex instead of flat, by the 9th raised on anterior half, by the outer interstriae with fine but distinct punctures, by the carinae on 2nd and 3rd urosternites and by the male genitalia (cf. fig. 24, 26).

Hemiosus costalis sp. nov.
(Figs 2, 8, 15, 25)

Length of male holotype: 2.90 mm.

Head melanic with metallic sheen. Pronotum testaceous, with a melanic spot on anterior edge, behind the eyes. Scutellum reddish. Elytra testaceous with diffuse melanic spots. Thoracic sternites reddish, urosternites black. Femora testaceous. Distal segment of maxillary palpi dark on apex.

Profile of head convex (Fig. 2). Head with dense punctures the size of ommatidia, frons with slightly coarser punctures, more irregular in distribution. Pronotal disk with punctures twice as large as ommatidia, spaced by 1-3 times their diameter. Ground deeply punctulate (1/4-1/6 the size of punctures). Postero-lateral pits shallow, twice the size of punctures. Scutellum with a few punctures. Inner striae with round punctures twice the size of pronotal ones, spaced by the equivalent of their diameter; striae 6th to 10th with round contiguous punctures, up to 4 times as large as pronotal ones. In some parts of the elytron the punctures tend to square shape because of their closeness. Inner interstriae slightly convex, twice as wide as striae, with fine punctures (appearing finer on posterior third of elytron). Outer interstriae convex, 9th, 10th and 11th narrower than striae,

with fine sparse punctures. Interstria 10th raised on anterior half of elytron, 11th on anterior 3/4, but specially between 1/2 and 3/4 of elytral length (Fig. 8).

Mesosternal process: in lateral view anterior half strongly raised, with three projections, the second the strongest; posterior half moderately raised; in ventral view the process shaped as a moderately narrow rhomboid (Fig. 15). Median carina of the first apparent urosternite narrow, flat, under slanting light narrowly Y-shaped. Lateral carinae half the length of sternite. Urosternites 2nd to 4th with flat carinae, on 2nd 3/4 of the length of sternite, on 3rd 2/3 of the length, on 4th vestigial. Apical notch of fifth urosternite with bottom weakly produced. Lateral edges of urosternites microscopically crenulate. Basal pubescence covering from 2/3 to 3/4 of hind femora. Fore tarsi of males hairy, not swollen.

Male genitalia (Fig. 25): Basal piece short, with deep curved emargination on basal 1/3. Paramera gradually acuminate, with apices turned inwards. Median lobe bottle-shaped, swollen and rounded at apex, shorter than paramera; appendices acuminate with blunt apices, a little shorter than the median lobe.

Material examined: From Brazil: estado de Amazonas: rio Aripuana (lower course): Cachoeira dos Periquitos, 16.I.1962, leg. FRITKAU. Male holotype and allotype at the MZUSP. Three male paratypes at the MACN; one male paratype at the ZSB.

Etymology: from latin *costa*, *-ae*, "cost", in adjectival form, alluding to the three narrow, convex outer interstriae.

Discussion: *H. costalis* sp. nov. can be recognized by the narrow outer interstriae, by the microscopically crenulate apparent urosternites, by the mesosternal process in which the second projection is stronger than the anterior tooth and by the male genitalia, specially the apices of paramera turned inwards. See discussion of *H. bacchusi* sp. nov.

Hemiosus fittkai sp. nov.
(Figs 3, 16, 26)

Length of male holotype: 2.50 mm.

Head melanic with metallic sheen. Pronotum, scutellum and elytra testaceous, the pronotum with small diffuse spots. Sternites black. Femora testaceous. Distal segment of maxillary palpi dark at apex.

Head profile flattened; labrum directed downwards (Fig. 3). Head with dense punctures, on clypeus as large as ommatidia, on frons a little larger. Pronotum with punctures twice as large as ommatidia, spaced by 1-2 times their diameter. Ground smooth, finely and deeply punctulate. Punctures uninterrupted on median line. Postero-lateral pits twice the size of punctures. Lateral edges of pronotum smooth, with a row of coarse punctures. Scutellum punctured and punctulate. Inner elytral striae with punctures

slightly larger than those on pronotal disk, round, spaced by the equivalent of their diameter. Outer striae with round contiguous punctures, 2-3 times the size of pronotal ones, not enlarged on stridulatory patch (no lateral spot apparent). Inner interstriae 3-4 times as large as pronotal ones. Outer interstriae narrow (9th and 10th as wide as striae, 11th one and a half times as wide as stria 10th), convex; 11th raised on anterior 3/4 of elytron. Interstria 8th wider and more flattened than 9th. Punctures on outer interstriae obsolete.

Mesosternal process: in lateral view with very prominent, weakly curved anterior tooth, followed by a single weaker projection; posterior half strongly raised (Fig. 16); in ventral view short, rather narrow, weakly sagittate. First apparent urosternite with median carina Y-shaped, narrow, on posterior 1/3 hardly raised; lateral carinae Y-shaped, 2/3 of length of sternite. Urosternites 2nd to 4th with rudimentary carinae. Apical notch of fifth urosternite with bottom produced into a triangular tooth. Basal pubescence covering from 1/2 to 3/4 of hind femora.

Male genitalia (Fig. 26): Basal piece short, about 2/5 of total length, with deep curved emargination in basal 1/2. Paramera gradually acuminate, apices not turned inwards. Median lobe subconical, hardly shorter than paramera, narrowly rounded at apex; appendices acuminate, noticeably shorter than median lobe.

Material examined: From Brazil: estado de Amazonas: rio Itu (near r. Negro), in sandbank, 11.II.1962, leg. FRITKAU. Male holotype, allotype, one male paratype and one female at the MZUSP. One paratype of each sex at the ZSB, one paratype of each sex at the BM, one paratype of each sex at the NMNH, 4 male paratypes and 11 female paratypes at the MACN. Besides, some specimens in isopropanol reserved for anatomical studies.

Etymology: This species is dedicated to Dr E. J. FRITKAU, formerly of the Max-Planck-Institut, afterwards and until lately of the ZSB, who collected the material during the expedition of the Max-Planck-Institut and the Instituto de Pesquisas da Amazonia, and who kindly made it available to our work group.

Discussion: The head profile, with labrum pointing downwards (Fig. 3) differentiates *H. fittkai* from every other species with dense sculpture. Conversely, the dense pronotal sculpture with smooth ground is unique among species with a flattened head profile. The male genitalia are unmistakable, specially because of the straight apices of the paramera. The mesosternal process with a large, prominent anterior tooth is also characteristic. In the typical series the pronotal punctures are uninterrupted on the median line, while in *H. bacchusi* there is a narrow unpunctured (but punctulate) median band, at least on the center of the disk.

Hemiosus monstrosus sp. nov.
(Figs 4, 9, 17, 20, 27)

Length of male holotype: 2.60 mm.

Head melanic with metallic sheen. Pronotum testaceous with diffuse para-medial spots. Scutellum and elytra testaceous. Sternites reddish in the typical series. Femora testaceous. Distal segment of maxillary palpi dark on apical 1/3-1/2.

Head profile flattened; labrum broad, directed downwards (Fig. 4). Head with sparse punctures as large as ommatidia. Ground reticulate in both sexes. Pronotal disk with sparse punctures, as large as ommatidia; sides with rather dense punctures, twice the size of ommatidia. Ground reticulate in both sexes. Postero-lateral pits shallow, twice the size of punctures on sides. Median line unpunctured. Lateral edges smooth, finely margined. Scutellum reticulate, with some fine punctures. Inner elytral striae obsolete around scutellum, where they are marked by punctures as large as pronotal ones, spaced by 3-4 times their diameter; on the rest of the striae punctures are a little coarser and spaced by the equivalent of their diameter. Outer striae with slightly coarser punctures. Inner interstriae flat, 3-4 times as wide as striae; outer interstriae convex, about 3 times as wide as striae, the 11th a little narrower, specially on posterior half. Punctures on inner interstriae nearly as large as those on striae, on outer interstriae about 2/3 of those on striae. Interstria 1st (sutural) carinate between 3/5 and 4/5 of elytral length. Interstria 11th raised between 1/3 and 2/3 of elytral length. Elytral apices produced into triangles, narrowed at base of these, with extreme apices acute (Fig. 9); in females there are spine-shaped hairs on the outer edge of elytra, on posterior 2/3.

Mesosternal process: in lateral view with weak anterior tooth followed by a stronger, but ill-defined projection (Fig. 17); posterior part slanting backwards from the former; in ventral view shaped as a short, rather narrow rhomboid. First urosternites with fine carinae, the median one lowered on posterior end and appearing a little shorter than the sternite, the lateral ones 3/4 of the length of sternite. No carinae observed on urosternites 2nd to 4th. Fifth urosternite with narrow, semicircular apical notch (Fig. 20). Lateral edges of apparent urosternites smooth. Basal pubescence covering from 2/3 to 3/4 of hind femora. Fore tarsi of males with the three basal segments hairy, the second slightly swollen. Fore claws of males sickle-shaped; the remaining ones (all of them in females) weakly arched.

Male genitalia (Fig. 27): Basal piece very short and narrow (about 4 times as long as wide), narrowed asymmetrically at base. Paramera long, gradually acuminate, with apices strongly turned inwards. Median lobe shorter than paramera, subcylindrical, with apex rounded. Appendices not seen. The whole organ is very thick, not flattened as in other species, and it is difficult to open up the distal pieces without damage.

Material examined: From Brazil: Estado de Amazonas: r. Itu (near r. Negro), sand-bank, 17.II.1962, leg. FITTKAU. Male holotype and allotype at the MZUSP. One paratype of each sex at the ZSB, one paratype of each sex at the BM, one paratype of each sex at the NMNH, 7 male paratypes and 8 female paratypes at the MACN.

Etymology: from latin *monstrosus*, -a, -um, "monstrous", alluding to the characters that are exceptional in this genus: very strongly produced elytral apices, spine-like hairs on outer elytral edge of females, fifth apparent urosternite with semicircular apical notch, fore tarsi of males swollen.

Discussion: the characters just mentioned are enough to distinguish the species. The male genitalia are remarkable by the length of all the pieces, specially the basal one. The curious flattened head profile is shared by *H. fittkai* sp. nov. which has dense sculpture without ground reticulation, and by two species having, like *H. monstrosus*, reticulate head and pronotum: *H. laevicollis* OLIVA, 1994 and *H. punctipennis* sp. nov.; neither has coarse punctures on the pronotal sides and both have the median lobe nearly as long as the paramera.

This is the first time that spine-like hairs are found in the genus *Hemiosus*, and the first, as far as I know, that such hairs appear as a secondary sexual character. In the allied genus *Berosus* there are many species with spine-like hairs, but always with the same distribution in both sexes.

Hemiosus punctipennis sp. nov.
(Figs 5, 18, 28)

Length of male holotype: 2.40 mm.

Head melanic with metallic sheen. Pronotum testaceous with a pair of short para-medial bands and a pair of round anterior spots, all diffusely melanic, without metallic sheen. Scutellum testaceous. Elytra testaceous with diffuse spots. Sternites testaceous in type-material. Femora testaceous.

Head profile flattened, with labrum directed downwards (Fig. 5). Head with dense punctures as large as ommatidia, even finer on disk, behind eyes a little denser and coarser, elliptical. Ground reticulate in both sexes. Pronotum with fine sparse punctures, behind eyes a little coarser (as much as 2 times the size of ommatidia) and denser. No unpunctured median line. Ground reticulate in both sexes. Lateral edges of pronotum smooth, margined. Scutellum reticulate, with punctures as large as ommatidia. Inner elytral striae fine, deep, with punctures as large as the coarser among pronotal punctures. Outer striae with contiguous punctures, 3-4 times as large as ommatidia. Inner interstriae slightly convex, about 3 times as wide as striae, with numerous dense punctures half the size of those on striae, on interstriae 2nd, 3rd and 5th placed in several rows. Ground punctulate. Outer interstriae convex, one and a half to two times as wide as striae, 9th raised between 1/4 and 1/2, 10th only convex, 11th raised

between 1/2 and 3/4. Elytral apices narrowed, slightly produced in both sexes.

Mesosternal process: in lateral view weakly raised, without definite projections (Fig. 18); in ventral view long and very narrowly rhomboidal. Carinae of first urosternite fine, the median one flattened in posterior half. Urosternites 2nd to 4th with vestigial carinae. Apical notch of fifth urosternite with bottom produced into an arc. Lateral edges of apparent urosternites smooth. Basal pubescence covering from 2/3 to 3/4 of hind femora. Fore tarsi of males hairy, not swollen.

Male genitalia (Fig. 28): Basal piece broken in the two males (teneral). Paramera long, gradually acuminate; apices acute, turned inwards. Median lobe as long as paramera, subcylindrical, broadly rounded at apex; appendices acuminate, a little shorter than median lobe.

Material examined: From Uruguay: departamento de Artigas: San Gregorio, 9.XI.1959, leg. C. CARBONELL. Male holotype, allotype, one male paratype and three female paratypes at the MACN.

Etymology: from latin *punctum*, -i, "point", and *penna*, -ae, "wing", alluding to the numerous punctures on the elytral disk.

Discussion: This species belongs to the small group having a flattened head profile and dorsal reticulation of head and pronotum. Within this group (cf. discussion of *H. monstrosus*), it can be recognized by the elytral apices slightly produced in both sexes, by the outer interstriae (9th raised in anterior half, 11th on posterior half, 10th not raised), and by the male genitalia, specially by the median lobe nearly as long as the paramera, broadly rounded at apex.

Hemiosus sculptipennis sp. nov.
(Figs 6, 10, 19, 29)

Length of male holotype: 2.70 mm.

Head and scutellum melanic with strong metallic sheen. Pronotum and elytra testaceous with small spots that have no metallic sheen. In some specimens, the metallic sheen on scutellum is indistinct. Sternites black. Pubescent part of femora diffusely dark. Distal segment of maxillary palpi dark on apical 1/3.

Head profile convex; labrum directed backwards (Fig. 6). Head with dense punctures, on clypeus the size of ommatidia, on frons larger. Pronotum with punctures 1-2 times the size of ommatidia, dense (spaces 1/2 to 1 diameter). No unpunctured median line. Sides of pronotum with some coarser punctures. Ground coarsely and irregularly punctulate. Scutellum with some coarse punctures. Inner striae with punctures twice the size of pronotal ones; outer striae with punctures 3-4 times the pronotal ones, squarish, not enlarged on lateral spot. Inner interstriae 1.5 times as wide as striae (3rd a little wider), convex, with punctures half the size of those

on striae, deep, in one row except on 3rd interstria. The three outer interstriae narrower than striae, very convex, 10th and 11th raised in anterior 3/4, with fine punctures (Fig. 10). Elytral apices separately rounded.

Mesosternal process: in lateral view with strongly raised anterior half, with a short straight anterior tooth followed by a stronger projection, this in turn followed by a weaker one; posterior half separately raised (Fig. 19); in ventral view sagittate. First urosternite with narrow, flat median carina; lateral carinae Y-shaped, half as long as sternite. Urosternites 2nd to 4th with vestigial carinae. Apical notch of fifth urosternite with bottom produced into two small, blunt, contiguous teeth. Lateral edges of apparent urosternites smooth.

Male genitalia (Fig. 29): Basal piece very short (less than half of total length), with deep curved emargination taking up more than basal half. Paramera gradually acuminate; apices blunt, weakly turned inwards. Median lobe bottle-shaped, as long as paramera, acuminate at apex; appendices acuminate, a little shorter than median lobe.

Material examined: From Argentina: provincia de Entre Ríos: departamento de Colón: arroyo Mendoza, white sand bottom, 20.X.1989, leg. A. OLIVA: male holotype, allotype and one paratype of each sex at the MACN. From Entre Ríos: Concordia: arroyo Yuquerí Grande, balneario (bathing station) Cambá Paso, sandbank, 2.IV.1988, leg. A. OLIVA: 2 female paratypes in the MACN. From Entre Ríos: Victoria: arroyo Los Manantiales, III.1981, leg. A.O. BACHMANN, 3 male paratypes and 6 female paratypes at the MACN. Same locality, leg. A. OLIVA: one paratype of each sex at the MACN, one paratype of each sex at the ZSB, one paratype of each sex at the BM, one paratype of each sex at the NMNH, one paratype of each sex at the MZUSP. Besides: a small series in isopropanol, from arr. Los Manantiales, III.1981, reserved for anatomical studies. Also: from Entre Ríos: Liebig, X.1988, light-trap, leg. M. ZELICH, 4 specimens at the MACN.

Etymology: from latin *sculptus*, -a, -um, "sculpted", and *penna*, -ae, "wing", alluding to the coarse elytral sculpture which contrasts with the relatively fine one of the pronotum.

Discussion: This species can be recognized by the narrow elytral interstriae and the coarse striae punctures. The male genitalia are remarkable for the shortness of the basal piece and by the acuminate median lobe, very broad at base and as long as the paramera.

H. sculptipennis sp. nov. is known from several localities across the province of Entre Ríos (cf. fig. 32), in which it was the only species caught. It appears to be the common species in that part of Argentina, always associated with bottoms of fine white sand (pers. obs.); it is safe to state that the species does not appear south of Entre Ríos, as the delta of the Paraná and the Northeast of Buenos Aires province have been exhaustively sampled by Dr A. O. BACHMANN and his collaborators, the author among them. No data are available about dispersion limits to the North.

3.3. Additional data about species mentioned in key

3.3.1. species with melanic pronotum

H. bruchi: Lateral edges of apparent urosternites crenulate, finely on basal sternites, coarsely on fifth. Male genitalia: basal piece very long, asymmetrical at base. Paramera narrow, sinuate, apices acuminate. Median lobe pear-shaped, much shorter than paramera; appendices acuminate, shorter than median lobe.

H. interimus: Pronotal ground densely punctulate. Punctures on inner striae a little larger than pronotal ones, those on outer striae 2-3 times as large as pronotal ones. Apical notch of fifth urosternite with bottom produced into a triangular tooth. Male genitalia: basal piece a little shorter than half of total length, with shallow emargination taking up nearly basal half. Paramera long, apices blunt, slightly turned inwards. Median lobe much shorter than paramera, subcylindrical; appendices acuminate, longer than median lobe.

H. moreirai: Pronotal punctures fine. Punctures on inner elytral striae about the same size as pronotal punctures, those on outer striae very coarse. Posterior half of mesosternal process (in ventral view) truncate behind. Apical notch of fifth urosternite with bottom produced into a triangular tooth. Lateral edges of apparent urosternites very finely crenulate (appearing smooth under less than 50 X). Male genitalia: basal piece long, nearly 2/3 of total length. Paramera with outer edges sinuate, convex at base and apex. Median lobe shorter than paramera, subcylindrical; appendices acuminate, shorter than median lobe.

H. regalis: Pronotal punctures 1-2 times as large as ommatidia. Inner elytral striae with punctures the size of pronotal ones; outer striae with much coarser punctures. Posterior half of mesosternal process (in ventral view) narrowing backwards. Apical notch of fifth urosternite with bottom produced into a triangular tooth.

H. schindleri: Male genitalia: Basal piece symmetrical at base, about half of total length. Paramera gradually acuminate, with apices slightly turned inwards. Median lobe pear-shaped, a little shorter than paramera.

H. varidius: Pronotum coarsely and densely punctured. Lateral edges of pronotum crenulate. Inner elytral striae with contiguous punctures, 2 times as large as those on pronotum; outer striae with coarser squarish punctures. First apparent urosternite with a tabular median carina. Apical notch of fifth urosternite with bottom produced into a triangular tooth.

H. variegatus: Pronotal punctures round, coarse and sparse; ground sparsely punctulate. Interstria 11th raised. Median carina of first apparent urosternite broad, tabular. Apical notch of fifth urosternite with bottom produced into a triangular tooth (fide ORCHYMONT, 1940).

3.3.2. Species with testaceous pronotum

H. cognatus: Male genitalia: basal piece very short, with deep curved emargination taking up basal 4/5 of piece. Paramera gradually acuminate, with outer edge slightly sinuate, convex sub-apically so that apices appear turned inwards. Median lobe subconical, rounded at apex, shorter than paramera; appendices acuminate, a little shorter than median lobe.

H. dejeani: Male genitalia: basal piece moderately long, shallowly emarginated in basal 1/3. Paramera acuminate. Median lobe subconical, shorter than paramera; appendices acuminate, as long as median lobe.

H. dimorphus: Punctures on inner elytral striae about 2 times the size of pronotal ones; those on outer striae about 3 times the size of pronotal ones. Mesosternal process short and narrow, weakly raised. Male genitalia: basal piece very long (nearly 2/3 of total length), slightly asymmetrical at base. Paramera with outer edge convex, apices acuminate, dilated sub-apically. Median lobe subcylindrical, much shorter than paramera; appendices acuminate, nearly as long as median lobe.

H. funditus: Male genitalia: basal piece a little shorter than half of total length, with shallow curved emargination in basal 2/5. Paramera gradually acuminate; apices appearing slightly turned inwards because of convex outer edge. Median lobe bottle-shaped, nearly as long as paramera, truncate at apex; appendices acuminate, nearly as long as median lobe.

H. hapalus: Male genitalia: basal piece short, with deep curved emargination in basal half. Paramera gradually acuminate. Median lobe subcylindrical, blunt, a little shorter than paramera; appendices acuminate, a little longer than median lobe.

H. hartmanni: Male genitalia: basal piece long (3/5 of total length), emarginate in basal 2/5. Paramera acuminate, narrowed in distal 1/3, narrowly rounded at apices, which appear turned inwards because of convex outer edge. Median lobe bottle-shaped, much shorter than paramera, rounded at apex; appendices a little shorter than median lobe, rounded at apices.

H. morlestus: Bottom of apical notch produced into a triangular tooth. Male genitalia: basal piece about half of total length. Paramera acuminate, with convex outer edge. Median lobe subconical, distinctly shorter than paramera, rounded at apex; appendices rounded at apices, shorter than median lobe.

H. mornarius: Male genitalia: basal piece half of total length, with deep curved emargination in basal 1/3. Paramera with sagittate apices. Median lobe subconical, a little shorter than paramera, swollen and rounded at apex; appendices blunt, shorter than median lobe.

H. mornax: Male genitalia: basal piece half of total length, with deep curved emargination taking up a little more than basal half. Paramera narrowed in distal half; apices acuminate, appearing turned inwards because of convex outer edge. Median lobe bottle-shaped, much shorter than

paramera, swollen and rounded at apex; appendices shorter than median lobe, rounded at apices.

H. multimaculatus: Male genitalia: basal piece a little longer than half of total length, deeply emarginated in basal 1/3. Paramera gradually acuminate, with apices slightly turned inwards. Median lobe bottle-shaped, shorter than paramera; appendices acuminate, a little shorter than median lobe.

H. mulvianus: Lateral edges of pronotum very finely crenulate. Punctures on outer striae enlarged on lateral melanic spot. Male genitalia: basal piece long, only a little more than half of total length because the organ is elongate. Paramera long, gradually acuminate, with apices slightly turned inwards. Median lobe subcylindrical, a little shorter than paramera; appendices blunt, shorter than median lobe.

H. tenembaumi: Carinae on first apparent urosternite narrow; urosternites 2nd to 4th with narrow vestigial carinae; apical notch of fifth with bottom produced into a triangular tooth. Male genitalia: basal piece half of total length, shallowly emarginate in basal 1/3. Paramera gradually acuminate, with apices strongly turned inwards. Median lobe subconical, broadly rounded at apex; appendices much shorter than median lobe, blunt.

4. Distribution

Figures 30-32 show the localities known up to date for the South-American species of *Hemiosus*. Data have been taken from OLIVA (1987, 1989a, 1991, 1994), as well as from material described in 2.1.

Some lacunae are apparent at once. The lack of data for the Chaco-Pampean plain is consistent with the preference for sandy bottoms shown by those species of which the habits are known. Since material of *Berosus* from this area is plentiful, (OLIVA, 1989b) we can safely affirm that *Hemiosus* species are actually absent from it. On the other hand, the absence of data from the Brazilian shield, where mountain streams abound, should be referred to mere lack of samples.

It is an interesting fact that on the northern half of South America a good number of species appear at, or close to, so-called refugia (SIMPSON & HAFFER, 1978). Seven species are known from such places: *H. bacchusi*, *H. costalis*, *H. fittkai* and *H. monstrosus* spp. nov., *H. moreirai* ORCHYMONT, *H. variegatus* (BOHEMAN) and *H. hartmanni* MOUCHAMPS. If we include a refugium in Santa Catharina, following GALLARDO (1979), we must add *H. dimorphus* ORCHYMONT. Four other species have been found both at refugia and at other localities: *H. aequatorialis* sp. nov., *H. hapalus* and *H. funditus* SPANGLER and *H. morlestus* ORCHYMONT.

Although forest covering does affect the flow of streams (therefore the type of bottom), it would be going too far to claim an association between *Hemiosus* species and forest refugia. It should be remembered that refugia are areas of special biological interest, therefore likely to be chosen for sampling.



Fig. 30. Maps showing known dispersion of *Hemiosus* species. 1: *H. moreirai*; 2: *H. regalis*; 3: *H. variegatus*; 4: *H. interimus*; 5: *H. bruchi*; 6: *H. varidius*; 7: *H. schindleri*; 8: *H. aequatorialis* sp. nov.; 9: *H. irinus* sp. nov.

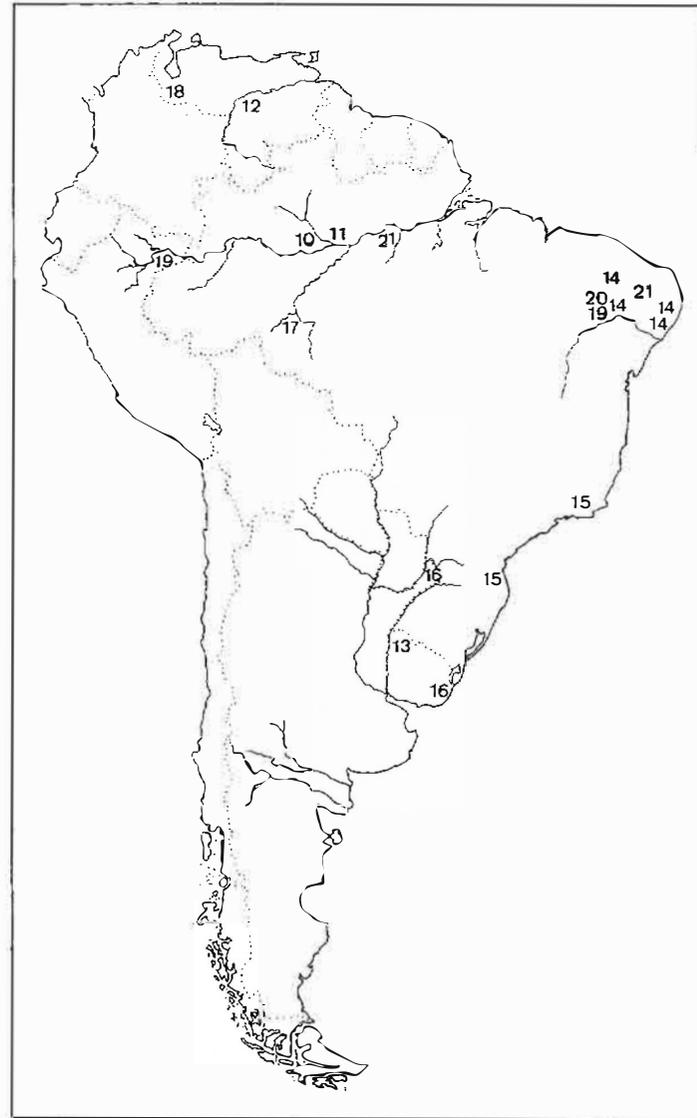


Fig. 31. Maps showing known dispersion of *Hemiosus* species. 10: *H. ftukai* sp. nov.; 11: *H. monstrosus* sp. nov.; 12: *H. laevicollis* (in press); 13: *H. punctipennis* sp. nov.; 14: *H. mulvianus*; 15: *H. dimorphus*; 16: *H. apicalis* sp. nov.; 17: *H. costalis* sp. nov.; 18: *H. bacchusi* sp. nov.; 19: *H. morlestus*; 20: *H. mornax*; 21: *H. mornarius*.

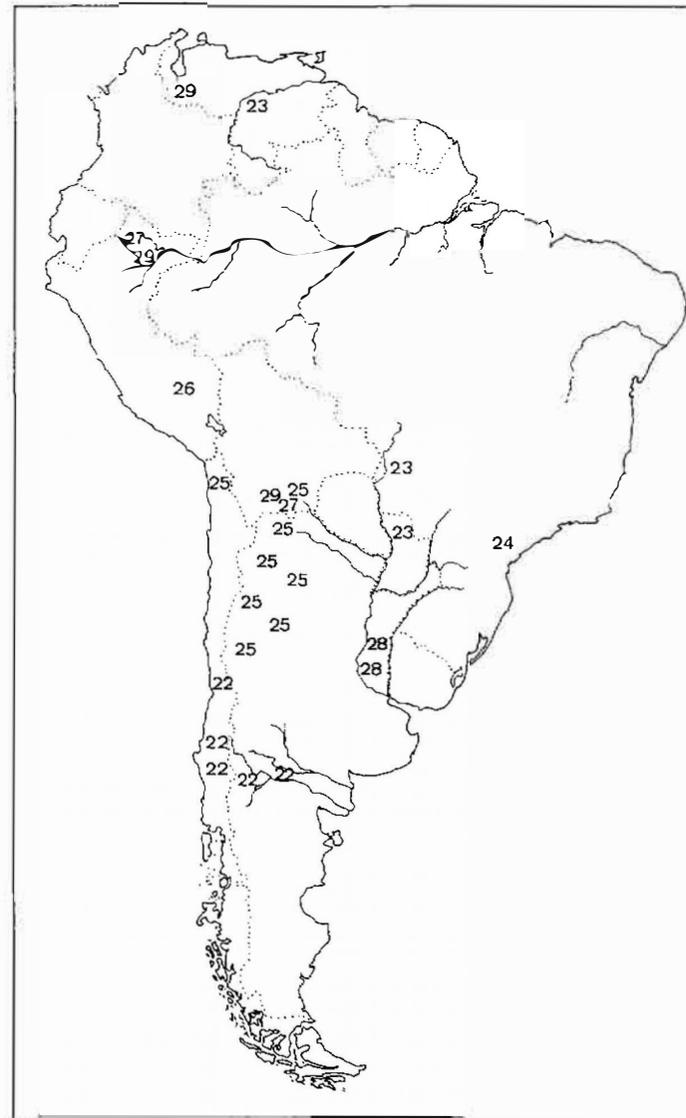


Fig. 32. Maps showing known dispersion of *Hemiosus* species. 22: *H. dejeani*; 23: *H. cognatus*; 24: *H. tenembaumi*; 25: *H. multimaculatus*; 26: *H. hartmanni*; 27: *H. hapalus*; 28: *H. sculptipennis* sp. nov.; 29: *H. funditus*.

Distribution along rivers, frequent in *Berosus* (OLIVA, 1989b) is not apparent in *Hemiosus*. This is probably due to the preference for a sandy substratum. Marginal pools along large plain rivers have usually a loamy bottom, even if sandy bottoms are found on small streams that run into such rivers. For instance, the distribution of *H. sculptipennis* sp. nov. is mapped on figure 32 (number 28). This species has been found at Victoria, a locality on the West of the province of Entre Ríos, quite close to the delta of the Paraná. Yet no *Hemiosus* has been found at the delta itself, in spite of the fact that sandy bottoms are found at certain places.

The genus *Berosus* appears to be more successful than the closely related genus *Hemiosus*: the number of species in South America is of 86 for the first genus and only 29 for the second. We know that the more pioneering and more widely dispersed species of *Berosus* are associated with temporary bodies of water and that they do not show a marked preference for one given type of bottom, being in fact often found in artificial bodies of water (OLIVA, 1989b). It appears likely that the acquisition of independence from sandy bottoms was a factor of evolutionary success for *Berosus*. On the other hand, the species of *Hemiosus* were barred from exploiting new habitats by their preference for sand.

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