Characterization of \textit{Platymessa} with redescription of the type species and a new generic synonymy (Arachnida, Opiliones, Cosmetidae)

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Abstract

The genus \textit{Platymessa} was originally described by Mello-Leitão and diagnosed following the Roewerian system. It originally included two species from the Colombian Andes. Subsequently, a third species was described: \textit{Platymessa transversalis} Roewer, 1963, which is herein transferred to the genus \textit{Chusgonobius} Roewer, 1952, forming the new combination \textit{Chusgonobius transversalis}. Herein, an emended diagnosis is given to \textit{Platymessa}, the type species, \textit{Platymessa h-inscriptum} Mello-Leitão, 1941, is redescribed and \textit{P. nigrolimbata} Mello-Leitão, 1941 is considered its junior subjective synonym. \textit{Brachylibitia} Mello-Leitão, 1941, is herein considered a junior subjective synonym of \textit{Platymessa} and its type species, \textit{Brachylibitia ectroxantha} Mello-Leitão, 1941, considered a species inquirenda, forming the new combination \textit{Platymessa ectroxantha}. Genital morphology of \textit{Platymessa h-inscriptum} is described and some characters are discussed regarding their importance in cosmetid taxonomy. Novel forms of sexual dimorphism are described in coxa IV.

Key words: Laniatores, Grassatores, Gonyleptoidea, Neotropics, Andes, Colombia, Peru

Introduction

Cosmetidae is the second most diverse family of Opiliones in the New World with more than 700 species (topped only by Gonyleptidae), however, its taxonomy is still unsatisfactory. Common problems about cosmetid taxonomy are descriptions and diagnoses of genera based on superficial characteristics (i.e. dorsal scutum armature, tarsal counts), as a consequence of their interpretation under the Roewerian system (Kury & Pinto-da-Rocha 2007). Likewise, the cosmetids do not possess the plentiful sculpture and details of other families such as the Gonyleptidae, making a survey of their more obvious external characters much more difficult. This is reflected in the lack of intermediary categories between genera and the family—Cosmetidae has only two subfamilies, compared to the 16 of Gonyleptidae, with roughly the same number of species (Kury 2013).

Some of the Andean genera of Cosmetidae possess flattened body, monomorphic chelicerae and short robust legs without heavy armature. It is not yet known whether these genera constitute a clade. Examples of these taxa are \textit{Ambatoiella} Mello-Leitão, 1943, \textit{Brachylibitia} Mello-Leitão, 1941, \textit{Eulibitia} Roewer, 1912, \textit{Libitia} Simon, 1879, \textit{Messatana} Strand, 1942 and \textit{Platymessa} Mello-Leitão, 1941.

This article aims to: (1) re-diagnose the genus \textit{Platymessa}, offering more characters than simply the useless Roewerian meristic and combinatory ones; (2) redescribe \textit{P. h-inscriptum} Mello-Leitão, 1941 (the type species of \textit{Platymessa}) recognizing \textit{P. nigrolimbata} Mello-Leitão, 1941 as its junior synonym; (3) recognize intraspecific variation of the pattern of white/yellow patches in \textit{Platymessa}, as already demonstrated for other cosmetids (e.g., Kury & Barros 2014).

Methods

Abbreviations of depository collections are as follows: ICN-AO (Universidad Nacional de Colombia, Instituto de
Ciencias Naturales, Bogotá, Colombia—curator Dr. Eduardo Flórez), MNRJ (Museu Nacional, Universidade Federal do Rio de Janeiro—curator Dr. Adriano Kury), SMF RII (Naturmuseum Senckenberg, Frankfurt am Main, Germany). Localities are referred to WWF Terrestrial Ecoregions of the World (Olson et al. 2011, here abbreviated as WWF) to contribute to their biodiversity inventory. Abbreviations used are CL, carapace length; CW, carapace width; AL, abdominal scutum length; AW, abdominal scutum width. Scanning Electron Microscopy was carried out with a JEOL JSM-6390LV at the Center for Scanning Electron Microscopy of Museu Nacional/UFRJ with accelerating voltage of 10 kV after sputter-coating with gold-palladium. All measurements are in mm. Tarsal formula: numbers of tarsomeres in tarsus I to IV, when an individual count is given, order is from left to right side (figures in parentheses denote number of tarsomeres only in the distitarsi I–II).

We use the conventions of Kury et al. (2007) to describe the dorsal scutum shape, also the terminology of Kury (2014) and Kury & Villarreal (2015) to describe the macrosetae (here abbreviated as MS A to E, Fig. 20) of penis ventral plate. Terminology of other morphological features follows Kury & Barros (2014).

Some terms have been recently introduced in the descriptive morphology of Gonyleptoidea, which are useful to quickly refer to some structures. The following terms are used here:

- **Ladder mask** (new term, Figs 1, 10–18): nickname for the pattern of white blots present in *Platymessa*. It consists of a pair of divergent longitudinal bars (analog to the rails of a ladder) connected by parallel thinner transverse blots (analog to rungs of a ladder) over scutal grooves.

- **Lyre** (Sørensen in Henriksen 1932): Although not explicitly named, this shape of white blot has been first described by Sørensen as: “with a narrow lyriform (or U-shaped) yellowish-white ribbon, interrupted posteriorly, which anterior parts are connected by a narrow transverse ribbon (often entire, often interrupted).” [our translation] and a species was named “lyra” after it. Piza (1944) also named another species “lyra”, describing thus the white mask: “dorsally ornate with a white lyre extending from the front of the cephalothorax to the scutal area IV, whose foot is represented by two also white lines which are directed obliquely from the middle of the area IV to the ends of the area V.” [our translation].

- **Equuleus** (Kury & Barros 2014): from Latin *equuleus* = “easel”. It is a white/yellowish-white spot of the dorsal scutum roughly in the shape of an easel present in many species of Cosmetidae, belonging to genus *Taito* Kury & Barros, 2014 and other presumably related genera such as *Vononoides* Roewer, 1912 and *Eucynortella* Roewer, 1912 (Kury & Barros 2014).

- **Coda** (Kury 2012): from Latin *coda* = “tail”. It is the posterior part of dorsal scutum, recognizable as the part with parallel straight sides, posterior to the main slope-change caused by the widened convex laterals. This term was first used and defined by Kury (2012).

- **Groin warts** (Kury & Barros 2014): Groin warts is a dorso-basal cluster of coarse tubercles on male coxa IV of many genera of Cosmetidae (*e.g.*, *Rhaucus* Simon, 1879, *Taito*). The term has been created by Kury & Barros (2014) in English, and we here provide a Latin translation—*clavus inguinis* (here abbreviated as ci, Fig. 6).

**Systematic accounts**

**Family Cosmetidae C.L. Koch, 1839**

**Chusgonobius Roewer, 1952**


**Chusgonobius transversalis** (Roewer, 1963) comb. nov.


**Type data.** ♂ holotype, 1 ♂ paratype (SMF RII 13948/299), from PERU, Cajamarca, Cueva de San Andrés, 30 km NE Cutervo.

**Remarks.** The allocation of this species to *Platymessa* is not supported by any combination of meaningful
characters. On the other hand, we might tentatively transfer it to *Chusgonobius* based on (1) dorsal scutum narrow gamma-shaped; (2) shape of equuleus with long slender body forming a triangle, well-developed arms and feet and horns short, very close to each other; (3) femur IV of male moderately elongate, substraight, only bent on distal fourth and (4) a comb of five spines closely placed in a prolaral apical row of femur IV.

**Platymessa Mello-Leitão, 1941**


*Platimessa* [incorrect original spelling]: Mello-Leitão 1941: 167.

*Brachylibitia* Mello-Leitão, 1941: 166; Kury 2003: 38 [junior subjective synonym of *Cynorta* C.L. Koch, 1839 by Goodnight & Goodnight (1953: 38); synonymy disclaimed by Kury (2003: 38); type species: *Brachylibitia ectroxantha* Mello-Leitão, 1941; by original designation]. SYN. NOV.

**Etymology.** *Brachylibitia*: from Greek βραχύς (short) + pre-existing generic name *Libitia*. Gender feminine. *Platymessa*: from Greek πλατύ- (flattened) + pre-existing generic name *Messa*. Gender feminine.

**FIGURES 1–6.** *Platymessa h-inscriptum* Mello-Leitão, 1941: 1. Male holotype (MNRJ 282), habitus, dorsal view. 2. Same, lateral view. 3. Male (ICN-AO 1186) habitus, frontal view. 4. Same, posterior view. 5. Male (MNRJ 58) proximal part of coxa IV showing groin warts, dorsal view. 6. Female (MNRJ 463) proximal part of coxa IV showing groin warts (or clavus inguinis = ci), dorsal view. Scale bars = 1 mm.

**Diagnosis.** Outline of the dorsal scutum beta-shaped in males and almost alpha-shaped in females (Figs 1, 7); coda longer in females (Fig. 9); scutal area V with two small paramedian granules; yellowish white color markings of scutum as a ladder mask (a pair of divergent bars connected by parallel thinner blots over scutal grooves) over dark brown background, thinner blots sometimes dissociated. Dorso-apical apophysis of coxa IV as a blunt spine (Figs 1, 7). Chelicerae monomorphic, weak, with marginal rows of acuminate tubercles of varied size on posterior border. Groin warts present, larger in female. Legs short and strong, femur III and IV slightly arched and with five longitudinal rows of small tubercles; basitarsomeres of leg I of male thicker than distitarsomeres but not swollen; cheliceral sockets shallow with well-marked lateral triangular projections.

**Taxonomic background of Brachylibitia and Platymessa.** Mello-Leitão (1941) described the genera *Brachylibitia* and *Platymessa* with three species from Colombia: *B. ectroxantha*, *P. h-inscriptum* and *P. nigrolimbata*. These new genera were based on the armature of the scutal areas and the count of tarsomeres of the leg I (see Discussion section). Roewer (1963) described a third species of *Platymessa, P. transversalis* from Peru also based only on those features.
Included species. Platymessa ectroxantha (Mello-Leitão, 1941) comb. nov., species inquirenda and Platymessa h-inscriptum Mello-Leitão, 1941 (type species).

Platymessa ectroxantha (Mello-Leitão, 1941) comb. nov., species inquirenda

Brachylibitia ectroxantha Mello-Leitão, 1941: 166, fig. 1; Kury 2003: 38.
Cynorta ectroxantha: Goodnight & Goodnight 1953: 38.

Type data. Type(s) (whereabouts unknown, probably once in MNRJ, now lost), COLOMBIA, Boyacá, La Uvita (6°17’N; 72°30’W).

Etymology. From Greek ἐκτρανόω (signify clearly) + ξανθός (yellow).

Remarks. The type material of this species is lost. Mello-Leitão’s original description is enough to recognize this as a Platymessa as defined here and a different species from P. h-inscriptum, although a search for topotypes is needed to allow the assessment of many characters. Therefore, the comparative diagnosis as given here is severely limited to what can be squeezed from the original description.

Diagnosis. Scutal area I unarmed, area V with two acuminate tubercles. Ladder-blot with rungs only, no rails. Tarsus III heptamerous. Length of legs ca. 9/15/11/15 mm.
FIGURE 29. Northern Andes of Colombia, showing the recorded localities of *Platymessa h-inscriptum* Mello-Leitão, 1941. Colored patches on the background represent WWF Terrestrial Ecoregions of the World. Relevant Colombian departments and WWF ecoregions are labeled.

*Platymessa h-inscriptum* Mello-Leitão, 1941

*Platymessa h-inscripta* Mello-Leitão, 1941: 167, fig. 2.
*Platymessa h-inscriptum*: Kury & Alonso-Zarazaga 2011: 51

*Platymessa nigrolimbata* Mello-Leitão, 1941: 168, fig. 3; B. Soares 1945: 344; Kury 2003: 81. **SYN. NOV.**

**Type data.** *Platymessa h-inscriptum*: COLOMBIA, Santander [and not Tolima as wrongly extrapolated by Kury 2003], Espinal, ♂ holotype (MNRJ 282, examined); *Platymessa nigrolimbata*: COLOMBIA, Santander, San Gil: ♀ holotype (MNRJ 463, examined); Boyacá, La Uvita, 2 ♂ and 1 ♀ paratypes (MNRJ 58, examined).

**Other material examined.** COLOMBIA, Boyacá, Tipacoque, Vereda La Calera, (06°23.8' 91''N; 072° 43.4' 10''W), 2800m, 1-5 April 2013, M. Medrano, 1 ♂ and 11 ♀ (ICN-AO 1186); Santander, Zapatoca, Vereda La Cacica, Reserva La Montaña Mágica (6°50,044'N; 73°18,241'W), 1964 m, 6 November 2013, C. Perafán and D. Martínez, 1 ♂ and 2 ♀ (ICN-AO 1384).

**Taxonomic background of *Platymessa h-inscriptum.*** By the original description of *P. h-inscriptum*, Mello-Leitão (1941) used an upper-case H and feminine ending. Those were corrected later to lower-case (Kury 2003) and neuter gender (Kury & Alonso-Zarazaga 2011), although the hyphen should be kept. H. Soares (1970) (probably by a lapse) during the description of another species used this species (as a comparison) in combination with *Cynorta*, thus following the reasoning of Goodnight & Goodnight (1953), although these authors had not mentioned *Platymessa* in their extensive synonymy.
Remarks. The characters allowing the recognition of *P. nigrolimbata* as a distinct species as proposed by Mello-Leitão (1941) have not been explicitly stated by him, but by reading the descriptions the differences clearly rely on (1) the pattern of the scutal white blots and (2) tarsomere counts. All of these fall within the range of variation as shown here.

**Diagnosis.** Scutal area I with a pair, area V with two small blunt tubercles. Ladder-blot with well-marked divergent rails. Tarsus III hexamerous. Length of legs ca. 7/14/9/11 mm.

**Description of male holotype (with extra figures from other specimens).** Measurements. CL = 1.68, AL = 2.77, CW = 2.68, AW = 4.39, Fe IV = 4.13, Ti IV = 3.06. Dorsum (Figs. 1, 7). Dorsal scutum beta-shaped, areas I, III and V with small tubercles and area IV with minute tubercles more separately that the ones of the other areas. Lateral margins with a row of minute tubercles at the bulge. Posterior margin of scutum straight in dorsal view with a row of small tubercles. All tergites and anal operculum finely granular and unarmed. Venter (Figs 2, 4). Free sternites finely granular, unarmad. Chelicerae (Fig. 28). Basichelicercite with posterior row of many tubercles, of which six are larger. Pedipalps (Fig. 26, 27). Trochanter with strong ventral process. Femur with pronounced dorsal keel, with a ventral row of eleven setiferous tubercles and a strong mesodistal process. Shallow slit along tibia mesal surface, separating the dorsal and ventral sides. Legs (Figs 5, 6 and 22-24). Coxa IV with groin warts. Trochanter IV with small retro-distal apophysis. Femur IV slightly arched with two longitudinal ventral rows of small tubercles along his entire length, increasing in size apically. Patella IV substraight with small setiferous tubercles. Tarsal counts: 6-6/?-10/6-6/7-7. Color. Body and appendages brown. Ladder mask yellowish white. Genitalia (Figs 19-21). Penis ventral plate subrectangular, narrower basally, with lateral borders parallel and distal border slightly concave; dorsal apophysis of glans subsquare, wattle long. Macrosetae B located in the proximal third of the ventral plate. The shapes and organization of macrosetae are as follows: MS C1-C2 large, curved and flat at the apex; MS D1-D2 large, cylindrical, just curved at the apex, more dorsal than the others; MS D1 as large as C2 and moderately curved, but not flattened, MS D2 more basal and straight (see Discussion for details). MS A1-A2 large, straight, cylindrical and located almost in the middle of the ventral plate; MS B and MS E1-E2 ventral, very small and immersed in the microsetae. The MS B are the most basal MS. Microsetae confined to the lateral margins of the ventral plate.

**Variation.** Color in 70% ethanol, medium to light brown with a posterior yellowish-white line that can be dissociated in the middle forming two short lines in the extremes, a small spot or nothing. Pattern of yellow spots as in figures 10 to 18. Tubercles of pedipalpal femur vary in number from 9 to 11. Tarsal counts: 5-6; 8-12; 5-6; 6-7. Variation of measurements are given in Table 1.

**TABLE 1.** Range of body and appendage measurements in *Platymessa h-inscriptum* Mello-Leitão, 1941.

<table>
<thead>
<tr>
<th></th>
<th>Males n=6</th>
<th>Females n=14</th>
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<tbody>
<tr>
<td>CL</td>
<td>1.94</td>
<td>1.68</td>
</tr>
<tr>
<td>AL</td>
<td>3.44</td>
<td>2.77</td>
</tr>
<tr>
<td>CW</td>
<td>3.07</td>
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<td>AW</td>
<td>5.16</td>
<td>4.39</td>
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<td>Fe I</td>
<td>2.42</td>
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<tr>
<td>Ti I</td>
<td>1.71</td>
<td>1.42</td>
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<tr>
<td>Fe II</td>
<td>4.73</td>
<td>3.93</td>
</tr>
<tr>
<td>Ti II</td>
<td>3.88</td>
<td>2.99</td>
</tr>
<tr>
<td>Fe III</td>
<td>3.67</td>
<td>2.91</td>
</tr>
<tr>
<td>Ti III</td>
<td>2.46</td>
<td>1.88</td>
</tr>
<tr>
<td>Fe IV</td>
<td>4.58</td>
<td>3.58</td>
</tr>
<tr>
<td>Ti IV</td>
<td>3.22</td>
<td>2.04</td>
</tr>
</tbody>
</table>

**Sexual dimorphism.** Females subtly larger than males with coda longer and correspondent shorter bulge, making its dorsal scutum alpha-shaped (Figs. 8, 9). Males with basitarsus thicker but not notably swollen (Fig. 25), groin warts smaller that in females (Figs. 5, 6).
**Distribution.** *P. h-inscriptum* was described from the locality “Espinal, Colombia” by Mello-Leitão (1941), which Kury (2003) wrongly extrapolated as “Espinal, Tolima”. However, we found a more suitable location for this name, as there is an Espinal in Santander, which corresponds to a place near San Gil, Santander and La Uvita, Boyacá, type locality and record, respectively, of *P. nigrolimbata* (Fig. 29). All of these occurrences match the WWF ecoregion NT0136 (Magdalena Valley montane forests).

**Discussion**

**Original alleged distinction between *Platymessa* and *Brachylibitia*.** Both genera were described in adjacent pages of the same paper. Mello-Leitão followed faithfully the Roewerian paradigm (e.g., Roewer 1912), contrasting *Brachylibitia* and *Platymessa* by: (1) area I unarmed (vs. with pair of tubercles); (2) area V with pair of spines (vs. pair of tubercles); (3) tarsus III heptamerous (vs. hexamerous). It has been abundantly shown that distinction of armature on scutal areas in Gonyleptoidea may be either result of incorrect evaluation (different authors perceiving variable phaneres either as granules or tubercles implying in different armature formulas, see for example discussions in Piza 1942 or Kury 1990) or simply autapomorphies (see for example discussion in Kury 1989, where a new species of *Mitobates* Sundevall, 1833 with entirely unarmed area III was described, while all other species in that genus possess a pair of high spines). Likewise, for decades, many examples have been advanced that the boundaries established by Sørensen (in Henriksen 1932) and Roewer (1912) of 6 vs. 7 tarsomeres on leg I are far from absolute. Therefore, distinction of both genera is fallacious and artificial.

**Little known sexual dimorphism.** External morphology of Cosmetidae is much more subtle than in Gonyleptoidea for example, but gradually some progress is being made on our understanding of many characters. *Platymessa* and putative related genera possess subtle sexual dimorphism in two features: (1) the shape of the coda, which is moderately longer in females (also described for the Peruvian genus *Platygyndes* Roewer, 1943 by Pinto da Rocha & Hara 2011) (Figs. 8–9) and (2) the groin warts, which are markedly larger in females (Figs 5 and 6).

**Use of pedipalps and male genitalia in the diagnosis of *Platymessa*.** In spite of our more or less detailed description and pedipalpus and male genitalia for *P. h-inscriptum*, we could not compare those with related species because this information is simply not available in the literature. A lot of alpha taxonomy will have to be done in Cosmetidae before we have a clear picture of the character distribution in the different lineages.

**Pattern of scutal blots.** The white blot patterns, extremely common on the dorsal scutum in cosmetids have been widely used to diagnose species, but without regard to variation. These patterns are very useful to characterize species provided that this variation is understood and documented. The hypothetical original shapes may undergo moderate to severe degrees of dissociation until resulting in a blank scutum. Early examples of describing this variation are Goodnight & Goodnight (1953) for an American species and Goodnight & Goodnight (1976) for a Mexican species. Also Pinto-da-Rocha & Yamaguti (2013) and Kury & Barros (2014) provided impressive examples of this dissociation in South American species.

Once the variation is illustrated it is much easier to understand the diagnostic patterns for each species or species groups. There are examples in the literature and from our own unpublished observations of basic patterns which even subject to variation allow the establishment of homologies, such as the easel, sausage and butterfly equulei of *Taito* (Kury & Barros 2014), the lyres of *Metavononoides* Roewer, 1928 (unpublished data), the paired points of *Ambatoiella* Mello-Leitão, 1943, the parabolic series of polygons in *Rhaucoides* Roewer, 1912 and *Cumbalia* Roewer, 1963 (unpublished data) and the scaramuccia of *Flirtea picta* (Perty, 1833) (Kury & García in press).

Likewise, the ladder mask of *Messatana* and *Platymessa* is easily recognizable and important for identification of these genera, although some variation is present as described here. As commented above, in the species remarks, Mello-Leitão (1941) used a pulverizing approach, by creating two different species for two stages of dissociation of this ladder mask of the type species of *Platymessa*.

**Macrosetae D of ventral plate.** Kury & Villarreal (2015) interpreted our MS D1 as a C3 (in *Metarhaucus* Pickard-Cambridge, 1905). Here we recognize two elongate MS D (Figs. 19-21): D1 inserted very closely to MS C2 and D2 shifted to dorsal and proximal, closer to MS A1. This recognition is based on the cylindrical and straight form, as opposed to that of curved and flattened C1-C2 and on the study of a denser sample of macrosetae patterns in many species of cosmetids compared to the few used in the original proposal. In *Platymessa* and related genera
MS C3 is lost, however, in many Cosmetidae both C3 and D1 are present, such as in *Gryne marginalis* (Perty, 1833) and some *Roquettea* Mello-Leitão, 1931 (in Ferreira & Kury, 2010 and Kury & Ferreira 2012).

**Acknowledgements**

This study has been supported by grant # 562149/2010-4 (PROTAX—OPESC project) and scholarship # 302116/2010-9 (PO—AMMA project) from the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) to ABK and by grant #190595/2013-2 from the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) to M. Medrano. Tiago Bernabé prepared the photos of the holotype. We thank to Eduardo Flórez for the loan of ICN material and Ricardo Pinto-da-Rocha (USP) for kindly sharing his photographs of the types of *Platymessa transversalis* taken in the SMF. The SEM micrographs were taken in the SEM Lab of Marine Diversity of the MNRJ (financed by PETROBRAS), with the kind assistance of Amanda Veiga.

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