

Taxonomic considerations on *Lobocneme* Rehn, 1911 and *Paroxyopsis* Rehn, 1911 and a new synonymy (Insecta Mantodea: Stagmatopterinae)

Salvatrice Ippolito & Francesco Lombardo

Department of Biological, Geological and Environmental Sciences, Division Animal Biology "M. La Greca, University of Catania, via Androne, 81, I-95124 Catania, Italy. E-mail: ippolito@unict.it; lombafra@unict.it

Abstract: The authors, on the basis of new morphological data, consider the genus *Paroxyopsis* Rehn, 1911 a junior synonym of *Lobocneme* Rehn, 1911 and they transfer to this latter genus the species currently attributed to *Paroxyopsis*: *Lobocneme icterica* (Saussure & Zehntner, 1894) n. comb.

Keywords: Mantodea, Mantidae, Stagmatopterinae, new synonymy, new combination, South America.

INTRODUCTION

During the revision of the genus *Parastagmatoptera* Saussure we found two females from Isla El Rosario (Colombia), identified by Beier as *Parastagmatoptera* n. sp. and currently deposited in the Naturhistorisches Museum Wien (NHMW) (coll. Stocker) (Fig. 8). The examination of the two specimens showed the presence of a small lobe on the middle and hind femora, which is not a characteristic of the genus *Parastagmatoptera* while it is typical of the related but little known genus *Lobocneme* created by Rehn (1911) for *Parastagmatoptera lobipes* Redtenbacher, 1892 and to which the two specimens are attributable. Rehn in the same work also erected the genus *Paroxyopsis*, for *Oxyops icterica* Saussure & Zehntner, 1894 from South America, which in his opinion differed from *Lobocneme* by the presence of the lobe only on the hind femora; this fact caught our attention and, having had the possibility to examine the types relative to two genera, we realized that:

- It is not true that in the genus *Paroxyopsis* the lobes are found only on the hind femora; the typus, even if it is damaged, still retains the middle left femur and the hind right femur and it can be seen that both are lobed as in *Lobocneme*.
- The shape of the eyes, the shape and length of the pronotum and the black stripe on the inner surface of the fore coxae are shared by both genera.

The reason Rehn believed that in *Paroxyopsis* only the hind femora were lobed might be due to the fact that he did not see the typus of *P. icterica*, but only referred to the original description, mistakenly interpreting what Saussure and Zehntner wrote regarding the lobe of the femora. In fact, the sentence "*femorum posticorum ca-*

rina infera apice lobato minimo" was interpreted as if only the hind femora presented a lobe. But, as it can be deduced further on in the same article, the authors used the same sentence for the genus *Phyllovates* which, as it is known, presents middle and hind lobed femora.

In conclusion, since there is not any difference between the two genera with respect to the number of lobed femora, they must be treated as synonyms. Therefore, in accordance with the principle of priority (23.1 and 23.3) of the ICZN, *Lobocneme* is the valid name and *Paroxyopsis* is a new synonym of it. Consequently the following three species: *L. lobipes* (Redt.), *L. colombiae* (Heb.) and *L. icterica* (Sauss. & Zehnt., n. comb.) must be ascribed to genus *Lobocneme*.

MATERIAL AND METHODS

This study is based on the holotypes of: *Oxyops icterica*, deposited at the Muséum d'Histoire Naturelle de Genève (MNHG); *Parastagmatoptera lobipes* deposited at the Natural History Museum, London-UK (BMNH) and additional specimens deposited in the following collections: Academy Natural Sciences Philadelphia (ANSP), Naturhistorisches Museum Wien (NHMW) and Museum of Animal Biology of Catania (MDAB).

The measurements were taken under a dissecting microscope using an ocular eyepiece with a scale bar. The following measurements were taken: total length of the body, measured from head to tip of abdomen; width head, measured from between the lateral margins of the eyes; pronotal length measured from the anterior margin to posterior margin of pronotum; length of metazona measured from the supracoxal sulcus to posterior margin of pro-

notum; supracoxal dilation width measured between the lateral margins of supracoxal sulcus; pronotal minimum width; coxal length measured from the coxal insertion to external margins of distal lobes; femoral length measured from the basal apex to external margin of the geniculate lobe; femoral maximum width; length tegmina measured from the thoracic insertion to distal margin. Anatomical terminology followed Snodgrass (1935), except for the copulatory apparatus that followed La Greca (1954).

The study of morphology was carried out using a stereoscopic microscope Leica MZ 12, with a micrometric ocular and a camera lucida attached. Images of the relevant structures were obtained through a stereoscopic microscope Leica MZ 205A (equipped with the software Leica Application Suite v. 4.2.0).

In order to avoid repetitive typing, we provide a spination formula for the legs, as first introduced by Rivera (2010a).

TAXONOMY

Genus *Lobocneme* Rehn, 1911

Lobocneme Rehn, 1911: 10.

Paroxyopsis Rehn, 1911: 8 (**n. syn.**).

Lobocneme. – Giglio-Tos, 1914: 37. – Giglio-Tos, 1927: 600. – Beier, 1964: 950. – Terra, 1995: 68. – Cerdà, 1997: 22. – Ehrmann, 2002: 208. – Otte & Spearman, 2005. – Agudelo *et al.*, 2007: 110.

Paroxyopsis. – Giglio-Tos, 1914: 19. – Giglio-Tos, 1927: 588. – Beier, 1964: 950. – Terra, 1995: 68. – Ehrmann, 2002: 275. – Otte & Spearman, 2005. – Agudelo *et al.*, 2007: 110.

Type species: *Parastagmatoptera lobipes* Redtenbacher, 1892 by monotypy.

Diagnosis: Mantises of medium size (length of body from head to tip of abdomen between 30-32 mm) with a general ochre appearance. Both sexes are fully winged, these are hyaline in the male, opaque and coloured in the female. Pronotum elongated; fore coxae far shorter than the metazona and with an internal basal black strip (Figs 1-2); middle and hind femora with a small apical lobe. Spination formula F=15IS/5ES/4DS and T=14IS/11ES. External genitalia, with phalloid apophysis (Figs 3-4) constituted by a broader anterior branch and an elongated posterior branch; ventral phallosome directed downwards (Fig. 5).

Remarks: *Lobocneme* is the best candidate to be the sister genus of *Parastagmatoptera* recently revised by Lombardo *et al.* (2014), because it shares the same shape of the pronotum, the black spot on the inner surface of the fore coxae and the same structural model of the external male genitalia. It can be distinguished based on its middle and hind femora that have a small lobe on the apical portion of the posterior ventral carina.

Lobocneme lobipes (Redtenbacher, 1892)

Figs 1-5, 6A-C

Parastagmatoptera lobipes Redtenbacher, 1892: 206.

Parastagmatoptera lobipes. – Brunner, 1893: 605. – Saussure & Zehntner, 1894: 189. – Kirby, 1904: 299. – Rehn, 1905: 177.

Lobocneme lobipes. – Rehn, 1911: 11. – Giglio-Tos, 1914: 37. – Giglio-Tos, 1927: 600. – Beier, 1964: 950. – Terra, 1995: 68. – Ehrmann, 2002: 208. – Otte & Spearman, 2005: pp. – Agudelo *et al.*, 2007: 110.

Typical material examined: BMNH; holotype male of *Parastagmatoptera lobipes* from St. Vincent (Lesser Antilles).

Additional material examined: MDAB; 1 male; St Vincent, Kingstown 15.5.1937 (coll. Lombardo).

Note: This species has been described and illustrated by Redtenbacher (1892) based on a male from the island of St. Vincent (Fig. 6A-C) and currently deposited in the Natural History Museum London (BMNH); the year after, Brunner v. Wattenwyl (1893) also furnished a brief description and illustration of the female from island of Grenada (Lesser Antilles). We examined a male from the same locality of the holotype, currently deposited in the Museum of Animal Biology of Catania (MDAB) and we consider it useful to describe and figure the male genitalia that have been unknown until today.

External genitalia: ventral phallosome (Fig. 5) broader than long, median lobe well developed; distal process with acuminate apex directed downwards to right. Phalloid apophysis (Figs 3-4) with anterior branch enlarged with small granules, posterior branch narrower shorter and folded to right, apex exhibit sparse small spines.

Distribution: This species occurs in islands of Saint Vincent and Grenada in the west (Lesser) Antilles.

Lobocneme icterica (Saussure & Zehntner, 1894)

n. comb.

Fig. 7

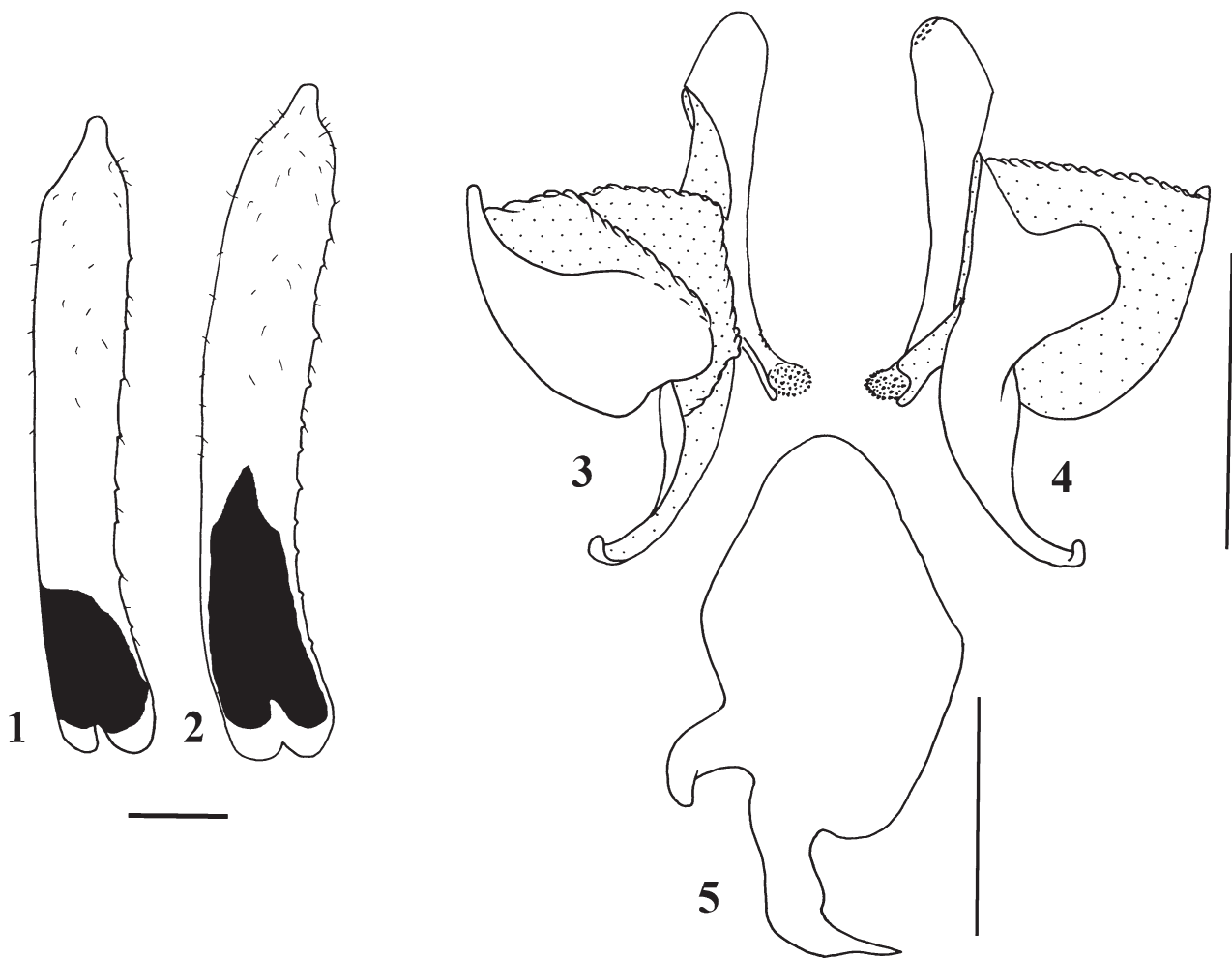
Oxyops icterica Saussure & Zehntner, 1894: 190.

Oxyops icterica. – Kirby, 1904: 298.

Paroxyopsis icterica. – Rehn, 1911: 8. – Giglio-Tos, 1914: 19. – Giglio-Tos, 1927: 588. – Beier, 1964: 950. – Terra, 1995: 68. – Ehrmann, 2002: 275. – Otte *et al.*, 2005. – Agudelo *et al.*, 2007: 125.

Type material examined: MNHG; holotype female of *Paroxyopsis icterica* from South America.

Remarks: This species is known only from the female holotype (Fig. 7), originating from an unspecified area of South America, deposited in the Muséum d'Histoire Naturelle de Genève (MHNG). It is generally in fair condition, with only some damage to the anal area of the mesothoracic wings; the right middle leg and the left hind leg are missing.



Figs 1-5. *Lobocneme lobipes*: (1, 2) Anterior coxae male and female. (3) Left phallomere in dorsal view. (4) Left phallomere in ventral view. (5) Ventral phallomere. Scale = 1 mm

Ehrmann (2002) mentioned it from Mato Grosso (Urucum) but in our opinion this latter locality must be eliminated, because it is related to a misidentification made by Giglio-Tos (1900), who erroneously assigned to *Oxyops icterica* Sauss. & Zehnt. a male specimen from Urucum (Mato Grosso), as he himself subsequently admitted (1914). Therefore the distribution of this species in South America remains unknown.

***Lobocneme colombiae* (Hebard, 1919)**

Fig. 8

Lobocneme colombiae Hebard, 1919: 137.

Lobocneme colombiae. – Giglio-Tos, 1927: 601. – Beier, 1964: 950. – Terra, 1995: 68. – Cerdà, 1997: 22. – Ehrmann, 2002: 208. – Otte & Spearman, 2005. – Agudelo *et al.*, 2007: 110.

Material examined: NHMW; 2 females; Colombia, Isla Rosario Caribe, Agosto 1961, (Heidi Stoker leg.).

Note: This species was described by Hebard (1919) based on a single male from Santa Marta (Magdalena Dep.) in Colombia, and the holotype is deposited in the Academy of Natural Sciences in Philadelphia (ANSP). To this species the two female specimens from Isla del Rosario mentioned above must also be assigned. We consider it useful to provide a short description of the female unknown until today.

Description of female: General coloration of body ochraceous (Fig. 7); legs ochraceous; mesothoracic wings with costal area greenish; discoidal area brown. Methathoracic wings yellow.

Head: pentagonal 2.03 times as wide as pronotal supracoxal dilation; fastigium of the vertex slightly convex and more elevated than the imaginary line joining the apex of eyes; juxtaocular tubercles weakly developed; eyes weakly conical; frontal shield transverse about 2.5 times wider than high. Antennae elongated, all segments with two pairs of short hairs.

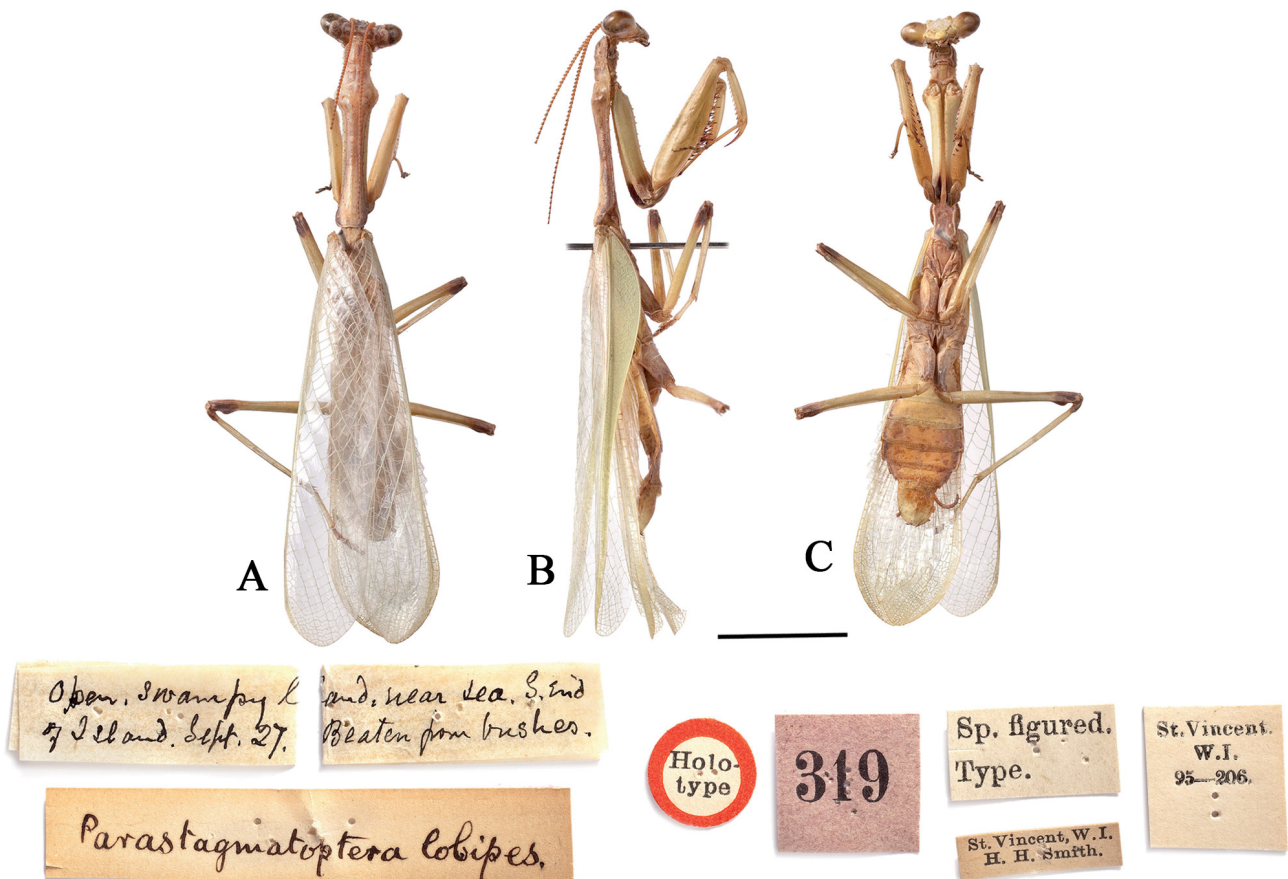


Fig. 6. Holotype of *Parastigmatoptera lobipes*. (A) Dorsal view. (B) Lateral view. (C) Ventral view. Scale 1 cm.

Torax: pronotum slender, about 4.31 times as long as the pronotal supracoxal dilation and 8.9 times as long as its minimum width; lateral margins with small denticles; supracoxal dilation not very developed and with lateral margins widely rounded. Disc of prozone with minute granules; disc of the metazone with an indistinct median carina extending about 1/3 of its length; ratio metazone/prozone is 2.8. Fore legs slender: coxae (Fig. 2) 0.62 times as long as the pronotum, prismatic with a triangular section; inner surface with a black band covering about 1/3 of the length of coxae; all margins with small tubercles with an apical short hair; inner distal lobes divergent. Femora 5.15 times as long as its maximum width, upper margin almost straight, all spines ochre with brown apex. Tibiae reaching half the length of the femora, all spines green with brown apex. Spination formula $F=14-16IS/5ES/4DS$ and $T=14-15IS/11ES$. Middle and hind legs slender; femora smooth, tibiae and tarsi with scarcely hairs. Posterior metatarsi 1.6 times as long as all other segments together. Wings well-developed, extending well beyond the apex of the abdomen; mesothoracic wing opaque about 2.8 their maximum width, with numerous

windows on the discoidal area; metathoracic wing yellow with numerous concentric hyalinae windows.

Abdomen: slender and cylindrical. Supranal plate short, triangular with rounded apex. Cerci extending beyond the subgenital plate, all segments cylindrical wider than long and densely hairy.

Dimensions [mm]: Total length body 32-33; width head 6.45-6.5; length prozona 3.45-3.8; length metazona 9.9-10.4; supracoxal dilation of pronotum 3.15-3.25; minimum width of pronotum 1.5-1.6; length coxae 8.4-8.9; length femur 9.9-10.7; maximum width of femur 1.9-2.1; length tegmina 20-20.2; maximum width tegmina 0.7-0.8.

Distribution: *P. colombiae* occurs in Colombia, in a unspecified locality of Venezuela (Cerdà, 1977), and in the Lesser Antilles (Ehrmann, 2002). It is our opinion that this latter area must be eliminated because a bibliographic research produced no evidence for the presence of this species in these territories.

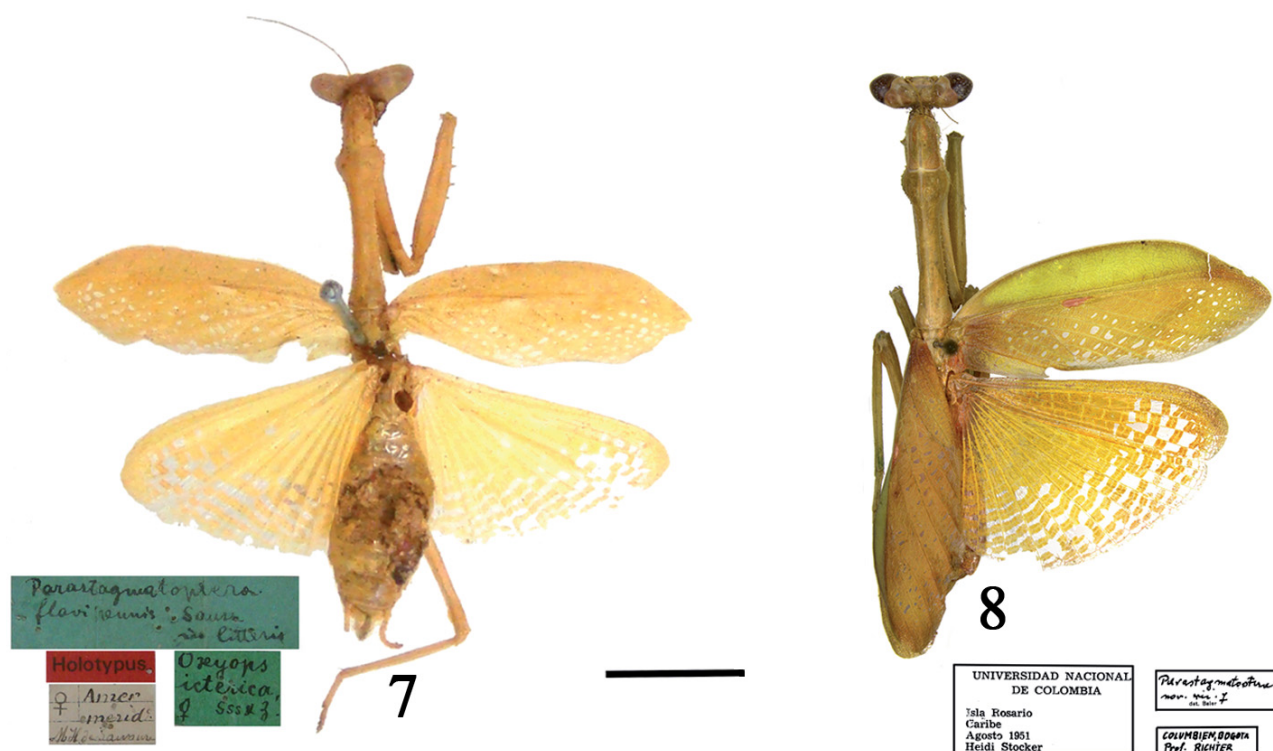


Fig. 7. Holotypus of *Paroxyopsis icterica* in dorsal view. Scale 1 cm.

Fig. 8. Habitus of the female of *Lobocneme colombiae*. Scale 1 cm.

ACKNOWLEDGMENTS

We express our gratitude to the following persons for their help and for having taken pictures of the types of *P. lobipes* and *P. icterica*: Judith Marshall (BMNH), Peter Schwendinger and John Hollier (MHNG).

REFERENCES

- Agudelo Rondón A.A., Lombardo F., Jantsch L.J. 2007. Checklist of the Neotropical mantids (Insecta, Dictyoptera, Mantodea). *Biota Colombiana* 8(2): 105-158 (124-125).
- Beier M. 1964. Blattopteroidea-Mantodea. In: Bronn H.G. (Ed.), Bronn's Klassen und Ordnungen des Tierreichs, Vol. 5, Insecta-Arthropoda, Part III, Book 5, Number 5, *Akademische Verlagsgesellschaft Geest & Portig K.-G.* 850-970 pp.
- Brunner von Wattenwyl K. 1893. On the Orthoptera of the Island of Grenada, West Indies. *Proceedings Zoological Society of London* 1893: 599-611.
- Cerda F. J. 1997. Mantodea de Venezuela. Generos y lista preliminar de especies. Parte IV: familia Mantidae (subfamilia Vatinae). *Boletín de la Sociedad Venezolana de Ciencias Naturales* 12(1): 17-31.
- Ehrmann R. 2002. Mantodea Gottesanbeterinnen der Welt. *Natur und Tier Verlag, Münster*; 519 pp.
- Giglio-Tos E. 1914. Mantidi esotici. VII. Vatinae. *Bollettino dei Musei di Zoologia ed Anatomia Comparata della Reale Università di Torino*, 29(684): 1-87 (20-23).
- Giglio-Tos E. 1927. Das Tierreich Orthoptera-Mantidae. *Walter de Gruyter, Berlin & Leipzig*, 50: 707 pp.
- Hebard M. 1919. Studies in the Dermaptera and Orthoptera of Colombia. 1. Dermaptera and Orthopterous families Blattidae, Mantidae and Phasmidae. *Transactions of American Entomological Society* 45: 87-179.
- Kirby W.F. 1904. A synonymic Catalogue of Orthoptera. (Forficulidae, Hemimeridae, Blattidae, Mantidae and Phasmidae). *British Museum (Natural History) London*, X+ 501 pp.
- Lombardo F., Umbriaco R., Ippolito S. 2014. Taxonomic revision of the Neotropical genus *Parastagmatoptera* Saussure, 1871 (Dictyoptera, Mantidae, Stagmatopterinae) with a biogeographic comment. *Insect Systematic and Evolution* 45: 1-47. DOI: 10.1163/1876312X-45032117.
- Marshall J.A. 1975. A catalogue of the primary types of Mantodea in the British Museum (Natural History). *Bulletin Natural History Museum*, London 31(8): 309-329.
- Otte D., Spearman L. 2005. Mantids Species File. Catalog of the mantide of the World. *Insect Diversity Association Publication* 1: 1-489.
- Redtenbacher J. 1892. On the Orthoptera of the Island of St. Vincent, West Indies. By C. Brunner v. Wattenwyl and Professor J. Redtenbacher. *Proceeding Zoological Society of London* 1892: 196-207.
- Rehn J.A.G. 1905. Notes on a small collection of Orthoptera from the lesser Antilles, with the description of *Orphulella*. *Entomological News* 16: 173-182.
- Rehn J.A.G. 1911. Mantodea. Subfamilie: Vatinae. In: Wystman P. (Ed.), *Genera Insectorum* 119: 18 pp.

Saussure H. de, Zehntner L. 1894. Mantidae. *In: Biologia Centrali-Americana. Insecta - Orthoptera. Société Entomologique Zürich, Zürich* 1: 123-197, Taf. 6-10.

Terra P.S. 1995. Revisão sistemática dos generos de louva-a-deus da região Neotropical (Mantodea). *Revista Brasileira de Entomologia* 39(1): 13-94.