



<http://dx.doi.org/10.11646/zootaxa.3797.1.12>

<http://zoobank.org/urn:lsid:zoobank.org:pub:D507E561-0EB7-486F-9D04-CCD432B2BF8E>

## An annotated checklist of the praying mantises (Mantodea) of Borneo, including the results of the 2008 scientific expedition to Lanjak Entimau Wildlife Sanctuary, Sarawak

CHRISTIAN J. SCHWARZ<sup>1,2,\*</sup> & OLIVER KONOPIK<sup>1</sup>

<sup>1</sup>University of Würzburg, Department of Animal Ecology and Tropical Biology, Theodor-Boveri-Institut, Biozentrum, Am Hubland, D-97074 Würzburg, Germany. E-mail: [oliver.konopik@uni-wuerzburg.de](mailto:oliver.konopik@uni-wuerzburg.de).

<sup>2</sup>Ruhr University Bochum, Department of Biology and Biotechnology, ND 1, D-44780 Bochum, Germany. E-mail: [Christian-Schw@gmx.de](mailto:Christian-Schw@gmx.de).

\* Corresponding author

### Abstract

We present the first checklist of praying mantids (Mantodea) of Borneo, with special reference to the specimens collected during the Scientific Expedition to Lanjak Entimau Wildlife Sanctuary 2008. With 118 confirmed species in 56 genera (including subgenera), Borneo is the island with the highest mantodean diversity known to date. In Lanjak Entimau 38 specimens representing 17 genera and 18 species were collected around the station lights and in surrounding secondary and primary forest. A new synonymy in the genus *Deroplatys* is established. The observed diversity patterns among Bornean mantids are discussed with reference to the biogeographic history of the Sunda Shelf since the Miocene.

**Keywords:** diversity, endemism, Hymenopodidae, Iridopterygidae, Liturgusidae, Mantidae, Tarachodidae, Toxoderidae, Sunda Shelf

### Introduction

In contrast to some familiar groups of mammals and birds, like apes, elephants, carnivores or hornbills (see, e. g. Payne *et al.* 1985, Kemp & Woodcock 1995, Gumaya & Silang 2002, Fernando *et al.* 2003, Kitchener *et al.* 2006, Wilting *et al.* 2007, Myers 2009), the arthropod fauna of Borneo is only superficially known. This holds also true for relatively less speciose orders such as Mantodea (praying mantids). Most work on Bornean mantids is older than eighty years and focused on taxonomic descriptions and faunistic records. The most important among the early contributions were those of De Haan (1842), Westwood (1835, 1841, 1889), Stål (1960, 1871, 1877), Brunner von Wattenwyl (1898), Hebard (1920), and particularly Giglio-Tos (1912, 1915b, 1915c, 1916, 1917a), Werner (1921, 1922a, 1923, 1924, 1926, 1930, 1933), and Beier (1931a, 1937, 1942, 1952, 1958, 1976). More recent records include Roy (1967, 2001, 2008, 2009, 2011, 2013), Roy & Svenson (2007), Bragg (2008, 2010), and Shcherbakov (2012). However, none of these studies constitute a comprehensive assessment of the Bornean mantid fauna, and a checklist of species occurring on the island is still lacking.

Current knowledge suggests that the Bornean mantodean fauna shows a strong relationship to that of the Malay Peninsula, Sumatra and the humid regions of Java, sharing almost all genera and a considerable amount of species with at least one of them. Of the 56 genera and subgenera known so far from the island, only one genus (*Gildella*) and two subgenera (*Pliacanthopus s. str.* and *Oligocanthopus*) may be considered putatively endemic. On species level, 43 out of 118 taxa (including three undescribed ones) are so far known from the island only. However, some taxa formerly thought to be endemic to Borneo were lately proven to be widespread across the Greater Sunda Islands Sumatra, Java and Borneo (Bragg 2010, Roy 2011). Therefore, these numbers of endemics must be regarded as preliminary. One additional taxon may add to the list of generic endemics (see below).

Ecological and life history aspects of Bornean mantids are virtually unknown. Most available data come either from observations of free-living specimens or captive bred stocks from other parts of the Malay Archipelago (e. g.

(SMSM). Frank Wieland, Roger Roy (MNHN), Julio Rivera (University of Toronto) and Gavin J. Svenson (CMNH) made valuable comments on earlier drafts of the manuscript.

## References

- Annandale, T.N. (1900) Observations on the habits and natural surroundings of insects made during the Skeat Expedition to the Malay Peninsula. *Proceedings of the Zoological Society of London*, 837–869.
- Audinet-Serville, J.-G. (1831) Revue méthodique des insectes de l'ordre des Orthoptères. *Annales des Sciences Naturelles*, 22, 28–65.
- Audinet-Serville, J.-G. (1837) Nouveau genre d'Orthoptères de la famille des Mantides. *Annales de la Société entomologique de France*, 6, 25–29.
- Audinet Serville, J.-G. (1839) *Histoire naturelle des Insectes. Orthoptères*. Librairie Encyclopédique de Roret, Paris, XVIII + 782 pp.
- Bazyluk, W. (1960) Die geographische Verbreitung und Variabilität von *Mantis religiosa* (L.) (Mantodea, Mantidae) sowie Beschreibungen neuer Unterarten. *Annales Zoologici*, 18 (15), 231–272.
- Beebe, W., Crane, J. & Hughes-Schrader, S. (1952) An annotated list of the mantids (Orthoptera, Mantoidea) of Trinidad, B.W.I.. *Zoologica*, 37 (19), 245–258.
- Beier, M. (1929) Weitere neue Mantiden aus der Sammlung des Naturhistorischen Museums in Wien. *Zoologischer Anzeiger*, 81 (7/10), 245–254.
- Beier, M. (1931a) Neue und interessante Mantiden. *Bulletin of the Raffles Museum*, 6, 149–154.
- Beier, M. (1931b) Neue und seltene Mantodeen aus dem Zoologischen Staatsinstitut und Zoologischen Museum in Hamburg. *Mitteilungen aus dem Zoologischen Staatsinstitut und Zoologischen Museum in Hamburg*, 45, 1–21.
- Beier, M. (1933) Beiträge zur Fauna sinica. XIII. Die Mantodeen Chinas. *Mitteilungen aus dem Zoologischen Museum in Berlin*, 18 (3), 322–337.
- Beier, M. (1934) Mantodea, Fam. Mantidae, Subfam. Hymenopodinae. *Genera Insectorum*, Fascicule 196, 1–37. [Nachträge 1937a, 2 pp.]
- Beier, M. (1935a) Mantodea, Fam. Mantidae, Subfam. Thespinae. *Genera Insectorum*, Fascicule 200, 1–32. [Nachträge 1937b, 1 p.]
- Beier, M. (1935b) Mantodea, Fam. Mantidae, Subfam. Orthoderinae – Choeradodinae – Deroplatynae. *Genera Insectorum*, Fascicule 201, 1–10.
- Beier, M. (1935c) Mantodea, Fam. Mantidae, Subfam. Mantinae. *Genera Insectorum*, Fascicule 203, 1–146. [Nachträge 1937c, 3 pp.]
- Beier, M. (1937) Results of the Oxford University Expedition to Sarawak (Borneo), 1932. Mantodea. *Proceedings of the Royal Entomological Society of London (B)*, 6 (9), 177–181.  
<http://dx.doi.org/10.1111/j.1365-3113.1937.tb01684.x>
- Beier, M. (1942) Neue und seltene Mantodeen aus deutschen Museen. *Annalen des Naturhistorischen Museums in Wien*, 52, 126–154.
- Beier, M. (1952) Die Mantiden der Subtribus Haaniees (Thespinae – Oligonychini) (Orth.). *Treubia*, 21, 199–210.
- Beier, M. (1956) Mantiden aus Ceylon (Orth.). Ergebnisse einer Sammelreise von F. Keiser nach Ceylon 1953/54. *Verhandlungen der Naturforschenden Gesellschaft Basel*, 67 (1), 33–40.
- Beier, M. (1958) Mantiden aus dem Museum Zoologicum Bogoriense (Orthoptera). *Treubia*, 24 (2), 245–247.
- Beier, M. (1964) Blattopteroidea, Mantodea. In: Bronn, H.G. (Ed.), *Klassen und Ordnungen des Tierreichs. Fünfter Band: Arthropoda. III Abteilung: Insecta*. Geest & Portig, Leipzig, pp. 849–970.
- Beier, M. (1965) Die Mantodeen Neu-Guineas. *Pacific Insects*, 7 (3), 473–502.
- Beier, M. (1966) Noona Dan Papers No. 29. Die Mantiden der Noona Dan Expedition nach den Philippinen und Bismarck Inseln. *Entomologische Meddelelser*, 34, 361–370.
- Beier, M. (1968) 12. Mantodea (Fangheuschrecken). In: Helmcke, J.-G., Starck, D., Wermuth, H. (Eds.), *Handbuch der Zoologie. IV. Band: Arthropoda – 2: Insecta*. Walter de Gruyter & Co., Berlin, pp. 1–47.
- Beier, M. (1976) Zur Kenntnis der Gattungen *Toxodera* und *Paratoxodera* (Mantidea). *Revue suisse de Zoologie*, 83 (2), 393–400.
- Berg, M., Schwarz, C.J. & Mehl, J.E. (2011) *Die Gottesanbeterin, Mantis religiosa*. Die Neue Brehm-Bücherei Bd. 656, Westarp Wissenschaften, Hohenwarsleben, 521 pp., 21 pls.
- Birkenmeier, E. (1971) Observations on *Amantis reticulata* (Haan) in Brunei (Dictyoptera – Mantidae). *Museum Journal*, 2 (3), 147–159.
- Blanchard, E. (1853) Description des insectes – Orthoptères. In: Jaquinot, M. (Ed.), *Voyage au Pole Sud et dans l'Océanie sur les corvettes L'Astrolabe et La Zélée. Zoologie IV (1)*. Trunot & Co., Paris, pp. 349–376.
- Bolivar, I. (1897) Les Orthoptères de St-Joseph's College à Trichinopoly (Sud de l'Inde). *Annales de la Société entomologique de France*, 66, 282–316.  
<http://dx.doi.org/10.5962/bhl.title.66023>

- Bolivar, I. (1914) Examen de un pequeño lote de Ortópteros de Mindanao y del Himalaya. *Asociación Española para el progreso de las Ciencias*, 5 (4), 205–214.
- Bragg, P.E. (2008) Records of the genus *Citharomantis* Rehn, 1909 from Borneo (Insecta: Mantodea: Hymenopodidae: Acromantinae). *Sepilok Bulletin*, 8, 1–8.
- Bragg, P.E. (2010) A review of the Liturgusidae of Borneo (Insecta: Mantodea). *Sepilok Bulletin*, 12, 21–36.
- Brandon-Jones, D. (1998) Pre-glacial Bornean primate impoverishment and Wallace's line. In: Holloway, J.D. & Hall, R. (Eds.), *Biogeography and geological evolution of SE Asia*. Backhuys, Leiden, pp. 393–404.
- Bruner, L. (1915) Preliminary catalogue of the orthopteroid insects of the Philippine Islands – Order Mantaria. *University Studies*, 15 (2), 225–228 (31–34).
- Brunner von Wattenwyl, K. (1892) Révision du système des Orthoptères et description des espèces rapportées par M. Leonardo Fea de Birmanie. *Annali del Museo Civico di Storia Naturale di Genova, Serie 2a*, 13 (33), 1–230.
- Brunner v. Wattenwyl, K. (1897) *Betrachtungen über die Farbenpracht der Insekten*. Engelmann, Leipzig, 16 pp.
- Brunner v. Wattenwyl, K. (1898) Orthopteren des Malayischen Archipels, gesammelt von Prof. Dr. W. Kükenthal in den Jahren 1893 und 1894. *Abhandlungen herausgegeben von der Senckenbergischen Naturforschenden Gesellschaft*, 24 (2), 193–288, 5 pl.
- Burmeister, H. (1838) Fangheuschrecken. Mantodea. In: *Handbuch der Entomologie. Zweiter Band. Besondere Entomologie. Zweite Abtheilung. Kaukerfe, Gymnognatha (Erste Hälfte; vulgo Orthoptera)*. Enslin, Berlin, pp. 517–552.
- Cranston, P.S. (2010) Insect biodiversity and conservation in Australasia. *Annual Review of Entomology*, 55, 55–75.  
<http://dx.doi.org/10.1146/annurev-ento-112408-085348>
- Cumings Outlaw, D. & Voelker, G. (2008) Pliocene climatic change in insular Southeast Asia as an engine of diversification in *Ficedula* flycatchers. *Journal of Biogeography*, 35, 739–752.  
<http://dx.doi.org/10.1111/j.1365-2699.2007.01821.x>
- Dantas, Y.K.L.A., Rafael, J.A., Motta, C.d.S., Agudelo, A.A. & Xavier Filho, F.F. (2008) Registros de Mantodea (Insecta) coletados à luz no dossel da floresta, na torre do km 14 do núcleo ZF-2, Manaus, Brasil. *Acta Amazonica*, 38 (2), 317–320.  
<http://dx.doi.org/10.1590/s0044-59672008000200015>
- De Haan, W. (1842) Bijdragen tot de Kennis der Orthoptera Zoologie. *Verhandelingen over de Natuurlijke Geschiedenis der Nederlandsche overzeesche Bezittingen door de Leden der Naturkundige commissie in Indië et andere Schrijvers*, 6, 45–248, 13 pl.
- Deeleman-Reinhold, C.L. (1957) Notes sur les mantides du Musée de Leyde avec la description d'un nouveau genre et de quelques espèces nouvelles. *Zoologische Mededelingen uitgegeven door het Rijksmuseum van Natuurlijke Historie te Leiden*, 35 (6), 55–67, 1 pl.
- Delfosse, E., Bauduin, A. & Bauduin, C. (2007) Nouvelles localisations et nouvelle synonymie pour la Mante-orchidée *Hymenopus coronatus* (Olivier, 1792) (Mantodea, Hymenopodidae). *Bulletin de la Société entomologique de France*, 112 (4), 529–530.
- Delfosse, E. (2009) Taxonomie, biogéographie et biologie de deux espèces de mantes asiatiques du genre *Deroplatys* Westwood, 1839, et notes sur trois autres placées dans le même genre (Insecta: Mantodea: Mantidae). *Le bulletin d'Arthropoda*, 39 (1), 4–28.
- Dohrn, H. (1894) *Phyllothelys macra* Westwood. *Entomologische Zeitung*, 35, 129–130.
- Edmunds, M. (1972) Defensive behaviour in Ghanaian praying mantids. *Zoological Journal of the Linnean Society*, 51, 1–32.  
<http://dx.doi.org/10.1111/j.1096-3642.1972.tb00771.x>
- Edmunds, M. (1976) The defensive behaviour of Ghanaian praying mantids with a discussion of territoriality. *Zoological Journal of the Linnean Society*, 58, 1–37.  
<http://dx.doi.org/10.1111/j.1096-3642.1976.tb00818.x>
- Ehrmann, R. (2002) *Mantodea – Gottesanbeterinnen der Welt*. Natur und Tier-Verlag, Münster, 519 pp.
- Ehrmann, R. & Roy, R. (2009) Taxonomy and synonymy of *Phyllothelys* Wood-Mason (Dictyoptera: Mantodea). *Annales de la Société entomologique de France (N. S.)*, 45 (1), 67–76.  
<http://dx.doi.org/10.1080/00379271.2009.10697590>
- Fabricius, J.C. (1775) *Systema Entomologiae*. Korte, Flensburg & Leipzig, XXX + 832 pp.
- Fabricius, J.C. (1781) *Species insectorum exhibentes eorum differentias specificas, synonyma, auctorum, loca natalia, metamorphosin adiectis observationibus, descriptionibus*. I. Bohn, Hamburgi et Kilonii, VIII + 552 pp.
- Fabricius, J.C. (1793) *Entomologia systematica emendata et aucta*. Tom. III, Pars I. Prost, Hafniae, 4 + 487 pp.
- Fernando, P., Vidya, T.N.C., Payne, J., Stuewe, M., Davison, G., Alfred, R.J., Andau, P., Bosi, E., Kilbourn, A. & Melnick, D.J. (2003) DNA analysis indicates that Asian elephants are native to Borneo and are therefore a high priority for Conservation. *PLoS Biol*, 1 (1), e 6,  
<http://dx.doi.org/10.1371/journal.pbio.0000006>
- García Becerra, R., de la Nuez Torres, R.I. & Pérez Sánchez, M. (2001) *Mantis y Cucarachas de Canarias*. Caja General de Ahorros de Canarias, Santa Cruz de La Palma, 160 pp.
- Gathorne-Hardy, F.J., Syaukani Davies, R.G., Eggleton, F. & Jones, D.T. (2002) Quaternary rainforest refugia in south-east Asia: using termites (Isoptera) as indicators. *Biological Journal of the Linnean Society*, 75, 453–466.  
<http://dx.doi.org/10.1046/j.1095-8312.2002.00031.x>
- Giebel, C.G.A. (1861) Neue ostindische Schrecken. *Zeitschrift für die gesammten Naturwissenschaften*, 18, 111–121.

- Giglio-Tos, E. (1907) Ortoteri africani. II. Blattodea, Mantodea, Phasmodea, Locustodea, Grillodea. *Bollettino dei Musei di Zoologia ed Anatomia comparata della R. Università di Torino*, 22 (563), 1–26.
- Giglio-Tos, E. (1912) Mantidi esotici. V. Mantes, Tenoderae, Hierodulæ et Rhomboderae. *Bollettino della Società Entomologica Italiana*, 43, 3–167.
- Giglio-Tos, E. (1913) Orthoptera, Fam. Mantidae, Subfam. Perlamantinae. *Genera Insectorum*, Fascicule 144, 1–13.
- Giglio-Tos, E. (1915a) Mantidi esotici. VIII. Acromantinae. *Bollettino dei Musei di Zoologia ed Anatomia comparata della R. Università di Torino*, 30 (702), 1–16.
- Giglio-Tos, E. (1915b) Mantidi esotici. Generi e specie nuove. *Bollettino della Società Entomologica Italiana*, 46, 31–108.
- Giglio-Tos, E. (1915c) Mantidi esotici. Generi e specie nuove. *Bollettino della Società Entomologica Italiana*, 46, 134–200.
- Giglio-Tos, E. (1916) Mantidi esotici. Generi e specie nuove. *Bollettino della Società Entomologica Italiana*, 47, 3–44.
- Giglio-Tos, E. (1917a) Mantidi esotici. Generi e specie nuove. *Bollettino della Società Entomologica Italiana*, 48, 43–108.
- Giglio-Tos, E. (1917b) Note al catalogo dei mantidi di Kirby. *Bollettino della Società Entomologica Italiana*, 48, 139–163.
- Giglio-Tos, E. (1919) Saggio di una nuova classificazione dei mantidi. *Bollettino della Società Entomologica Italiana*, 49, 50–87.
- Giglio-Tos, E. (1921) Orthoptera, Fam. Mantidae, Subfam. Eremiaphilinae. *Genera Insectorum*, Fascicule 177, 1–36, pls. 1–2.
- Giglio-Tos, E. (1927) *Das Tierreich*. 50. Lfg. – *Orthoptera Mantidae*. Walter de Gruyter & Co., Berlin & Leipzig, XL + 707 pp.
- Gorog, A.J., Sinaga, M.H. & Engstrom, M.D. (2004) Vicariance or dispersal? Historical biogeography of three Sunda shelf murine rodents (*Maxomys surifer*, *Leopoldamys sabanus* and *Maxomys whiteheadi*). *Biological Journal of the Linnean Society*, 81, 91–109.  
<http://dx.doi.org/10.1111/j.1095-8312.2004.00281.x>
- Guérin-Méneville, F.E. (1838) Voyage autour du monde sur la corvette La Favorite pendant les années 1830, 1831 et 1832 – Insectes. *Magazin de Zoologie*, 8, 81–160.
- Guérin-Méneville, F.E. (1843) Animaux articulés. In: Delassert, M.A. (Ed.), *Souvenirs d'un Voyage dans l'Inde exécuté de 1834 à 1839. Seconde Partie. Histoire Naturelle*. Fortin, Masson & Co., Langlois & Leclercq, Paris, pp. 33–98.
- Gumaya, K.K. & Silang, S. (2002) *Development of Lanjak Entimau Wildlife Sanctuary as a Totally Protected Area. Phase III. A Study of habitat conditions, populations, and distribution of Orang Utan in Lanjak Entimau Wildlife Sanctuary and Batang Ai National Park, Sarawak, Malaysia*. ITTO, Kuching, 4 pp.
- Handlirsch, A. (1925) Geschichte, Literatur, Technik, Paläontologie, Phylogenie und Systematik. In: Schröder, C. (Ed.), *Handbuch der Entomologie 3 (IV-VIII)*. Gustav Fischer, Jena, pp. 1–1201.
- Handlirsch, A. (1930) Insecta 1. In: Kükenthal, W. & Krumbach, T. (Eds.), *Handbuch der Zoologie 4 (1): Progoneata – Chilopoda – Insecta*. Walter de Gruyter & Co., Berlin, 892 pp.
- Heaney, L.R. (1984) Mammalian species richness on islands on the Sunda Shelf, Southeast Asia. *Oecologia*, 61, 11–17.  
<http://dx.doi.org/10.1007/bf00379083>
- Hebard, M. (1920) Studies in Malayan, Papuan, and Australian Mantidae. *Proceedings of the Academy of Natural Sciences of Philadelphia*, 71, 14–82.
- Helmkamp, M., Schwarz, C.J. & Beck, J. (2007) A first look at the biodiversity of praying mantids (Insecta: Mantodea) in Sabah, Borneo. *Sepilok Bulletin*, 7, 1–13.
- Heynderycx, J. (2000) *Parhymenopus davidsoni* Woodmason 1890 (Mantidae, Hymenoponae). *Lambillionea*, 100 (4), 623–624.
- Holzäpfel, E.P. & Harrell, J.C. (1968) Transoceanic dispersal studies of insects. *Pacific Insects*, 10 (1), 115–153.
- Jensen, D., Svenson, G.J., Song, H. & Whiting, M.F. (2009) Phylogeny and evolution of male genitalia within the praying mantis genus *Tenodera* (Mantodea: Mantidae). *Invertebrate Systematics*, 23 (5), 409–421.  
<http://dx.doi.org/10.1071/is09004>
- Kaltenbach, A. (1968) Ergebnisse der österreichischen Neukaledonien-Expedition 1965. Neue und wenig bekannte Orthopteren aus Neukaledonien. I. Mantodea, Saltatoria (exclus. Gryllodea) und Dermaptera. *Annalen des Naturhistorischen Museums in Wien*, 72, 539–556.
- Kaltenbach, A. (1979) Die Mantodea der Kanarischen Inseln. Kritische Übersicht und ergänzende Beschreibungen. *Annalen des Naturhistorischen Museums in Wien*, 82, 517–531.
- Kaltenbach, A. (1994) Eine neue Art der Gattung *Gonypeta* Saussure aus Thailand. *Annalen des Naturhistorischen Museums in Wien*, 96 B, 69–73.
- Kemp, A.C. & Woodcock, M. (1995) *Bird families of the world – The hornbills: Bucerotiformes*. Oxford University Press, Oxford and New York, 318 pp.
- Kirby, W.F. (1903) Description of a new species of Mantidae referred to in the above paper. *Zoologist*, 7 (4), 304.
- Kirby, W.F. (1904) *A synonymic catalogue of Orthoptera. Vol. I. Orthoptera Euplexoptera, Cursoria, et Gressoria*. British Museum (Natural History), London, X + 501 pp.
- Kitchener, A.C., Beaumont, M.A. & Richardson, D. (2006) Geographical variation in the Clouded Leopard, *Neofelis nebulosa*, reveals two species. *Current Biology*, 16 (23), 2377–2383.  
<http://dx.doi.org/10.1016/j.cub.2006.10.066>
- Koçak, A.Ö. & Kemal, M. (2008) Miscellaneous nomenclatural notes. *Centre for Entomological Studies Ankara, Miscellaneous Papers*, 145, 8–9.
- Kopp, H. (1999) Abiotische Geofaktoren. In: Wranik, W. (Ed.), *Sokotra, Mensch und Natur*, 14, pp. 3–22.

- Krauss, H.A. (1901) Beitrag zur Kenntnis der Orthopteren Deutsch-Südwestafrikas. *Verhandlungen der kaiserlich-königlichen zoologisch-botanischen Gesellschaft in Wien*, 51, 281–293.
- Latreille, P.A. (1802) *Histoire naturelle, générale et particulière des Crustacés et des Insectes*. Sonnini, C. S., Dufart, 3, Paris, XII + 467 pp.
- Leong, T.M. & Teo, S.C. (2008) Records of the praying mantis, *Theopropus elegans* (Westwood) (Mantodea: Hymenopodidae: Hymenopodinae) in Singapore, with notes on oviposition and hatching. *Nature in Singapore*, 1, 211–214.
- Lichtenstein, A.A.H. (1796) Insekt. Ordo II. Hemiptera; Insekt. Class. II. Ulonata. In: *Catalogus musei zoologici ditissimi Hamburgi, d. III. Februar 1796. Auktionis lege distrahendi. Sektio tertia continens Insekta*. Schniebes, Hamburg, pp. 77–85.
- Lichtenstein, A.A.H. (1802) A dissertation on two natural genera hitherto confounded under the name of Mantis. *Transactions of the Linnean Society of London*, 6, 1–39.  
<http://dx.doi.org/10.1111/j.1096-3642.1802.tb00466.x>
- Linnaeus, C. (1758) *Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Tomus I, editio decima, reformata*. Laurentii Salvii, Holmiae, Stockholm, 824 pp.  
<http://dx.doi.org/10.5962/bhl.title.542>
- Lombardo, F. (1986) Il genere *Apterocorypha* (Insecta, Mantodea) e descrizione di una nuova specie della Somalia. *Animalia*, 12 (1/3), 5–11.
- Lombardo, F. (1993) Studies on the Mantodea of Nepal (Insecta). *Spixiana*, 16 (3), 193–206.
- Lombardo, F. (1995) A review of the genus *Popa* Stål 1856 (Insecta Mantodea). *Tropical Zoology*, 8, 257–267.  
<http://dx.doi.org/10.1080/03946975.1995.10539285>
- Lombardo, F. & Perez-Gelabert, D.E. (2004) The Mantids of Hispaniola, with the description of two new species (Mantodea). *Boletín de la Sociedad Entomológica Aragonesa*, 34, 35–48.
- Loxton, R.G. (1979) On display behaviour and courtship in the praying mantis *Ephestiasula amoena* (Bolivar). *Zoological Journal of the Linnean Society*, 65, 103–110.  
<http://dx.doi.org/10.1111/j.1096-3642.1979.tb01083.x>
- MacKinnon, J. (1969) Indications of territoriality in mantids. *Zeitschrift für Tierpsychologie*, 27, 150–155.  
<http://dx.doi.org/10.1111/j.1439-0310.1970.tb01869.x>
- Mériguet, B. (2005) *Mantasoa*, nouveau genre de Mante endémique à Madagascar proche de *Tarachomantis* Brancsik (Dictyoptera, Mantidae). *Bulletin de la Société entomologique de France*, 110 (1), 43–46.
- Mériguet, B. (2013) *Madamantis*, un nouveau sous-genre inclus dans le genre *Tarachomantis* Brancsik, 1893 (Dictyoptera, Mantidae). *Bulletin de la Société entomologique de France*, 118 (1), 27–40.
- Milledge, G.A. (1997) Revision of the tribe Archimantini (Mantodea: Mantidae: Mantinae). *Memoirs of the Museum of Victoria*, 65 (1), 1–63.
- Morley, R.J. (2000) *Origin and evolution of tropical rainforests*. John Wiley & Sons, Ltd., Chichester, XIII + 362 pp.
- Mukherjee, T.K., Hazra, A.K. & Ghosh, A.K. (1995) The Mantid Fauna of India (Insecta: Mantodea). *Oriental Insects*, 29, 185–358.  
<http://dx.doi.org/10.1080/00305316.1995.10433744>
- Myers, S. (2009) *Birds of Borneo: Brunei, Sabah, Sarawak, and Kalimantan*. Princeton University Press, Princeton, NJ, 272 pp.
- Olivier, A.G. (1792) Mante. In: *Encyclopédie méthodique. Histoire naturelle. Insectes. Tome 7<sup>ème</sup>*. Panckoucke, Paris, pp. 616–642.
- Otte, D. & Spearman, L. (2005) *Mantida species file – Catalog of the mantids of the world*. Insect Diversity Association, Publication Number 1, Philadelphia, 489 pp.
- Ôuchi, Y. (1938a) A new soothsayer from Eastern China (Ortho., Mantidae). *Journal of the Shanghai Science Institute (Sect. III)*, 4, 23–26, pl. 3.
- Ôuchi, Y. (1938b) On new generic name designated by me for a Chinese soothsayer. *Journal of the Shanghai Science Institute (Sect. III)*, 4, errata slip.
- Ouwens, P.A. (1913) Eenige weinig bekende Mantis of Roofsprinkhanen van Java. *De Tropische Natuur*, 9 (2), 122–123.
- Payne, J., Francis, C.M. & Phillips, K. (1985) *A field guide to the mammals of Borneo*. Sabah Society, Kota Kinabalu and Kuala Lumpur, 332 pp.
- Peck, S.B. (2001) *Smaller orders of insects of the Galápagos Islands, Ecuador: Evolution, Ecology, and Diversity*. NRC Research Press, Ottawa, Ontario, Canada, 278 pp.
- Perez-Gelabert, D.E. (2008) Arthropods of Hispaniola (Dominican Republic and Haiti): a checklist and bibliography. *Zootaxa*, 1831, 1–530.
- Poulton, E.B. (1931) Immense numbers of a large mantid and moths blown on to a ship off the East Coast of Africa and out of sight of land. *Proceedings of the Entomological Society of London*, 5 (3), 84.
- Rehn, J.A.G. (1903) Studies in Old World Mantidae (Orthoptera). *Proceedings of the Academy of Natural Sciences of Philadelphia*, 55, 701–718.
- Rehn, J.A.G. (1909) A contribution to the knowledge of the Orthoptera of Sumatra. *Bulletin of the American Museum of Natural History*, 26, 177–186.
- Roy, R. (1962) Le Parc National du Niokolo-Koba (2<sup>ème</sup> fasc.). VI. Dictyoptera Mantodea. *Mémoires de l'Institut Français d'Afrique Noire*, 62, 91–103.

- Roy, R. (1963) V. Dictyoptera Mantodea (2<sup>e</sup> note). In: La réserve naturelle intégrale du Mont Nimba. *Mémoires de l'Institut Français d'Afrique Noire*, 66, pp. 163–206.
- Roy, R. (1967) Contribution à la connaissance des *Amorphoscelis* de la région orientale (Mantodea Amorphoscelidae). II. Les espèces d'Extrême-Orient. *Bulletin de la Société entomologique de France*, 71, 261–273.
- Roy, R. (1987) Le peuplement en mantes des îles situées au large de l'Afrique. *Bulletin de la Société zoologique de France*, 112 (1–2), 117–125.
- Roy, R. (1989) Une nouvelle espèce de Mante endémique à Madagascar (Dict. Mantidae). *Bulletin de la Société entomologique de France*, 94 (1–2), 15–19.
- Roy, R. (2001) Contribution à la connaissance des Angelinae de la région orientale: les genres *Euchomenella*, *Mythomantis* et *Tagalomantis* (Dictyoptera, Mantidae). *Revue française d'Entomologie (N. S.)*, 23 (1), 79–92.
- Roy, R. (2004a) Réarrangements critiques dans la famille des Empusidae et relations phylogénétiques (Dictyoptera, Mantodea). *Revue française d'Entomologie (N. S.)*, 26 (1), 1–18.
- Roy, R. (2004b) Révision et phylogénie des Choeradodini Kirby, 1904 (Dictyoptera, Mantidae). *Bulletin de la Société entomologique de France*, 109 (2), 113–128.
- Roy, R. (2004c) Précisions sur le genre *Mythomantis* Giglio-Tos et redescription de ses deux espèces (Dictyoptera, Mantidae). *Revue française d'Entomologie (N. S.)*, 26 (4), 157–163.
- Roy, R. (2005) Révision du genre endémique malgache *Tisma* Giglio-Tos (Dictyoptera Mantidae). *Bulletin de la Société entomologique de France*, 110 (1), 47–57.
- Roy, R. (2007) *Parymenopus* Wood-Mason, 1890, et *Cataspilota* Giglio-Tos, 1917, genres valides (Dict. Mantodea). *Bulletin de la Société entomologique de France*, 112 (1), 91–92.
- Roy, R. (2008a) Contribution à la connaissance du genre *Parablepharis* Saussure, 1870 (Mantodea). *Bulletin de la Société entomologique de France*, 113 (1), 53–60.
- Roy, R. (2008b) Vue d'ensemble sur les Tarachodinae malgaches (Dictyoptera, Mantodea). *Bulletin de la Société entomologique de France*, 113 (2), 183–186.
- Roy, R. (2009a) Une nouvelle synonymie pour le genre *Amorphoscelis* Stål, 1871 (Dict., Amorphoscelidae). *Bulletin de la Société entomologique de France*, 114 (1), 128.
- Roy, R. (2009b) Révision des Toxoderini *sensu novo* (Mantodea, Toxoderinae). *Revue suisse de Zoologie*, 116 (1), 93–183.
- Roy, R. (2011) Les Amorphoscelinae Indo-Malais (Mantodea, Amorphoscelidae). *Revue française d'Entomologie (N. S.)*, 32 (1–2), 65–92.
- Roy, R. (2013) Révision du genre *Pachymantis* Saussure, 1871 (Mantodea, Hymenopodidae). *Bulletin de la Société entomologique de France*, 118 (2), 145–154.
- Roy, R. & Schütte, K. (2010) Le genre endémique malgache *Tuberculepsus* Roy, 2008 (Dictyoptera, Mantodea). *Bulletin de la Société entomologique de France*, 115 (4), 401–416.
- Roy, R. & Svenson, G.J. (2007) Revision of the genus *Ceratomantis* Wood-Mason, 1876 (Dictyoptera, Mantodea). *Bulletin de la Société entomologique de France*, 112 (4), 433–444.
- Roy, R. & Svenson, G.J. (2011) Revision of *Platycalymma* Westwood, 1889 and the synonymy of *Ichromantis* Paulian, 1957 (Mantodea, Iridopterygidae, Tropicodantinae). *Zootaxa*, 3014, 1–25.
- Sathiamurthy, E. & Voris, H.K. (2006) Maps of Holocene sea level transgression and submerged lakes on the Sunda Shelf. *The Natural History Journal of Chulalongkorn University, Supplement 2*, 1–44.
- Saussure, H. de (1869) Essai d'un système des mantides. *Mittheilungen der Schweizerischen entomologischen Gesellschaft*, 3 (2), 49–73.
- Saussure, H. de (1870) Additions au système des mantides. *Mittheilungen der Schweizerischen entomologischen Gesellschaft*, 3 (5), 221–244.
- Saussure, H. de (1871a) Mélanges orthoptérologiques. III<sup>m</sup>e Fascicule. IV. Mantides. *Mémoires de la Société de physique et d'Histoire naturelle de Genève*, 21 (2), 1–214.
- Saussure, H. de (1871b): Mélanges orthoptérologiques. Supplément au III<sup>m</sup>e Fascicule. Mantides. *Mémoires de la Société de physique et d'Histoire naturelle de Genève*, 21 (2), 239–337, pl. 7.
- Saussure, H. de (1872) Mélanges orthoptérologiques. IV<sup>m</sup>e Fascicule. Mantides et Blattides. *Mémoires de la Société de physique et d'Histoire naturelle de Genève*, 23 (2), 1–164.
- Saussure, H. de (1898) *Analecta entomologica*. I. Orthopterologica. Famille des Mantides. *Revue Suisse de Zoologie*, 5, 183–248, 787–809.
- Schwarz, C.J. (2003) *Diets and habitat preferences of neotropical praying mantids (Dictyoptera: Mantodea, Burm. 1838)*. Diploma thesis at the University of Würzburg, 114 pp.
- Schwarz, C.J. & Helmkampf, M.E. (2014) A remarkable new species of *Mythomantis* Giglio-Tos, 1916 from northern Borneo, with notes on the systematics of Deroplatyinae Westwood, 1889 (Mantodea: Mantidae). *Zootaxa*, 3797 (1), 120–129. <http://dx.doi.org/10.11646/zootaxa.3797.1.11>
- Shcherbakov, E.O. (2012) New data on the genera *Euchomenella* and *Tagalomantis* (Dictyoptera: Mantidae: Angelinae). *Zoosystematica Rossica*, 21 (2), 270–278.
- Shelford, R.W.C. (1902) Observations on some mimetic insects and spiders from Borneo and Singapore. *Proceedings of the Zoological Society of London*, (2), 230–284, pls. 19–23.
- Shelford, R.W.C. (1903) Bionomical notes on some Bornean Mantidae. *Zoologist*, 7 (4), 293–304.

- Shelford, R.W.C. (1916) *A naturalist in Borneo*. 1<sup>st</sup> Edition. Fisher Unwin, London, 331 pp.
- Stål, C. (1860) Orthoptera species novas descripsit. In: Oscar, K. (Ed.), *Kongliga Svenska Fregatten Eugénies Resa Omkring Jordan under Befäl af C. A. Virgin, Åren 1851–1853. Zoologici. I. Insecta*. Norstedt & Söner, Stockholm, pp. 299–350, pl. 5.
- Stål, C. (1871) Orthoptera quaedam africana descripsit C. Stål. *Öfversigt af Kongliga Vetenskaps-Akademiens Vörhandlingar*, 28 (3), 375–401.
- Stål, C. (1877) Systema Mantodeorum. Essai d'une systématisation nouvelle des Mantodées. *Bihang till Kongliga Svenska Vetenskaps Akademiens Handlingar*, 4 (10), 1–91, 1 pl.
- Stoll, C. (1813) *Représentation exactement colorée d'après nature des spectres, des mantes, des sauterelles, des grillons, des criquets et des blattes. Qui se trouvent dans les quatre parties du monde, l'Europe, l'Asie, l'Afrique et l'Amérique*. J. C. Sepp, Amsterdam, 56 + 16 pp., 25 pls.
- Svenson, G.J. (2007) *The origins, evolution, and phylogeny of the praying mantises (Dictyoptera, Mantodea)*. PhD thesis at the Brigham Young University, 358 pp.
- Svenson, G.J. & Whiting, M.F. (2009) Reconstructing the origins of praying mantises (Dictyoptera, Mantodea): the role of Gondwanan vicariance and morphological convergence. *Cladistics*, 25, 468–514.  
<http://dx.doi.org/10.1111/j.1096-0031.2009.00263.x>
- Svenson, G.J. & Roy, R. (2011) Taxonomic treatment of the endemic Malagasy praying mantid genus *Hyalomantis* Giglio-Tos, 1915, with a new synonymy and the description of three new species (Mantodea, Iridopterygidae, Tropicodromantidae). *Zootaxa*, 2777, 1–24.
- Svenson, G.J. & Vollmer, W. (2014) A case of the higher-level classification of praying mantises (Mantodea) obscuring the synonymy of *Majangella* Giglio-Tos, 1915 (Liturgusidae, Liturgusinae) and *Ephippiomantis* Werner, 1922 (Hymenopodidae, Acromantinae). *Zootaxa*, 3797 (1), 103–119.  
<http://dx.doi.org/10.11646/zootaxa.3797.1.10>
- Thunberg, C.P. (1784) Mantis. In: *Dissertatio entomologica novam insectorum species, partem tertiam*. J. Edman, Upsaliae, pp. 53–68, pl. 1–2.
- Tinkham, E.R. (1937) Studies in Chinese Mantidae (Orthoptera). *Lingnan Science Journal*, 16 (4), 551–572, pl. 17.
- Uvarov, B.P. (1927) A new mantid from Burma. *Annals and Magazine of Natural History*, 9 (19), 658–659.
- Uvarov, B.P. (1940a) Twenty-eight new generic names in Orthoptera. *Annals and Magazine of Natural History*, 11 (5), 173–176.
- Uvarov, B.P. (1940b) Eleven new generic names in Orthoptera. *Annals and Magazine of Natural History*, 11 (6), 377–380.
- Voris, H.K. (2000) Maps of Pleistocene sea levels in Southeast Asia: shorelines, river systems and time durations. *Journal of Biogeography*, 27, 1153–1167.  
<http://dx.doi.org/10.1046/j.1365-2699.2000.00489.x>
- Wang, T. (1993) *Synopsis on the classification of Mantodea from China*. Shanghai Scientific and Technological Literature Publishing House, Shanghai, IV + 172 pp.
- Wang, T., Liu, X. & Yin, H. (1994) A new species of *Hymenopus* (Mantodea: Hymenopodidae: Hymenopodinae) from China. *Entomotaxonomia*, 16 (2), 79–81.
- Werner, F. (1906) Zur Kenntnis afrikanischer Mantodeen. *Jahreshefte des Vereins für Vaterländische Naturkunde in Württemberg*, 62 (34), 361–377.
- Werner, F. (1908) Die Mantodeen Abessyniens. Nach dem Material des St. Petersburger akademischen Museums. *Annuaire du Musée Zoologique de l'Académie Impériale des Sciences de St. Pétersburg*, 13, 108–128.
- Werner, F. (1911) Die Mantodeen der Aru- und Kei-Inseln. *Abhandlungen herausgegeben von der Senckenbergischen Naturforschenden Gesellschaft*, 33, 389–396.
- Werner, F. (1915) Verschleppung von Fangheuschrecken (Mantodeen) durch den Schiffer-Verkehr. *Zeitschrift für wissenschaftliche Insektenbiologie*, 11 (3–4), 98–99.
- Werner, F. (1916) Zur Kenntnis afrikanischer und indischer Mantodeen. *Verhandlungen der kaiserlich-königlichen zoologisch-botanischen Gesellschaft in Wien*, 66, 254–296.
- Werner, F. (1921) Über Mantodeen aus Niederländisch-Indien. *Treubia*, 2 (1), 125–135.
- Werner, F. (1922a) Zur Kenntnis der Mantodeenfauna der niederländischen Kolonien. *Zoologische Mededeelingen uitgegeven vanwege's Rijks Museum van Natuurlijke Historie te Leiden*, 7 (1–2), 115–126.
- Werner, F. (1922b) Philippine mantids, or praying insects. *Philippine Journal of Science*, 21 (2), 147–157, pl. 1.
- Werner, F. (1923) Zweiter Beitrag zur Kenntnis der Mantodeen von Niederländisch-Indien. *Treubia*, 3 (3–4), 387–404.
- Werner, F. (1924) Dritter Beitrag zur Kenntnis der Mantodeen von Niederländisch-Indien. *Treubia*, 5 (1–3), 259–266.
- Werner, F. (1926a) Eine neue *Hapalopeza*-Art aus Sumatra (Orthoptera, Mantodea). *Miscellanea zoologica sumatrana*, 9, 1–3.
- Werner, F. (1926b) Zur Kenntnis der Mantodeen der Philippinen. *Konowia*, 5 (3), 227–232.
- Werner, F. (1927a) Spolia Mentawiensia. Mantidae, or Praying Insects. *Treubia*, 9 (4), 413–422.
- Werner, F. (1927b) Verzeichnis der bis jetzt aus Sumatra bekannten Mantiden (Fangheuschrecken). *Miscellanea Zoologica Sumatrana*, 14, 1–5.
- Werner, F. (1928) Fauna sumatrensis. (Beitrag Nr. 60.). Mantodea (Orth.). *Entomologische Mitteilungen*, 17 (6), 412–414.
- Werner, F. (1930) Über asiatische Mantideen aus dem naturhistorischen Reichsmuseum in Stockholm. *Arkiv för Zoologi*, 21 A (34), 1–10, pls. 1–3.

- Werner, F. (1931a) Further notes on Indian mantids or praying insects. *Proceedings of the zoological Society of London*, 4, 1329–1334, pl. 1.
- Werner, F. (1931b) Mantidae. In: Résultats Scientifiques du Voyage aux Indes Orientales Néerlandaises de LL. AA. RR. le Prince et la Princesse Léopold de Belgique. Vol. IV, Fascicule 1. *Mémoires du Musée royal d'Histoire naturelle de Belgique*, pp. 33–36.
- Werner, F. (1933) Fünfter Beitrag zur Kenntnis der Mantodeen von Niederländisch-Indien. *Treubia*, 14 (2), 255–272, pl. 8.
- Werner, F. (1934) Mantides et Phasmides recueillis dans les Indes Orientales. *Bulletin du Musée royal d'Histoire naturelle de Belgique*, 10 (22), 1–5.
- Westwood, J.O. (1832) *Blepharis elegans*. In: Griffith, E. (Ed.), *The Animal Kingdom arranged in conformity with its organisation, by the Baron Cuvier, member of the Institute of France, &c. &c. &c. with supplementary additions to each order: Vol. 15. The Class Insecta. Vol. 2. Supplement on the Orthoptera*. Whittaker, London, pp. 190–191, pl. 78.
- Westwood, J.O. (1835) Insectorum arachnoidumque novorum decades duo. *Zoological Journal*, 5, 440–453, pl. 22.
- Westwood, J.O. (1839) *An introduction to the modern classification of insects. Vol. 1*. Longman, Orme, Brown, Green & Longmans, London, XII + 462 pp., 1 pl.
- Westwood, J.O. (1841) Description of a new genus of mantideous Orthoptera. In: *Arcana entomologica; or illustrations of new, rare, and interesting exotic insects I*. W. Smith, London, 33–34, pl. 9.
- Westwood, J.O. (1889) *Revisio insectorum familiae mantidarum, speciebus novis aut minus cognitissimis descriptis et delineatis*. Gurney & Jackson, London, 54 + III pp., 14 pls.
- Wieland, F. (2008) The genus *Metalyticus* reviewed (Insecta: Mantodea). *Species, Phylogeny and Evolution*, 1 (3), 147–170.
- Wiemers, M. (1993) Eine neue Gottesanbeterin der Gattung *Pseudoyersinia* von den Kanarischen Inseln (Mantodea, Mantidae). *Nachrichten des entomologischen Vereins Apollo*, 14 (3), 261–269.
- Wiltling, A., Buckley-Beason, V.A., Feldhaar, H., Gadau, J., O'Brian, S.J. & Linsenmair, K.E. (2007) Clouded leopard phylogeny revisited: support for species recognition and population division between Borneo and Sumatra. *Frontiers in Zoology*, 4 (15). [accessed online]  
<http://dx.doi.org/10.1186/1742-9994-4-15>
- Wood-Mason, J. (1876a) On some remarkable species of Mantidae. *Proceedings of the Asiatic Society of Bengal*, 175–176.
- Wood-Mason, J. (1876b) On some remarkable species of Mantidae. *Annals and Magazine of Natural History*, 18 (4), 506–507.
- Wood-Mason, J. (1878a) Notes on new and little-known Mantidae. *Annals and Magazine of Natural History*, 1 (5), 143–147.
- Wood-Mason, J. (1878b) On new and little-known Mantidae. *Proceedings of the zoological Society of London*, 38, 580–587.
- Wood-Mason, J. (1882) On new and little-known Mantodea. *Journal of the Asiatic Society of Bengal*, 51 (2), 21–36.
- Wood-Mason, J. (1889a) Monograph of *Phyllothelys*, a genus of Mantodes peculiar to the Oriental Region. *Annals and Magazine of Natural History*, 4 (6), 365–368.
- Wood-Mason, J. (1889) The Ethiopian and Oriental representatives of the Mantodean Subfamily Vatidae. *Journal of the Asiatic Society of Bengal*, 58 (3), 306–326.
- Wood-Mason, J. (1890a) Description of a new genus and species (*Parymenopus Davisoni*) of Mantodea from the Oriental Region. *Annals and Magazine of Natural History*, Ser. 6, 5, 437–439, pl. 17.
- Wood-Mason, J. (1890b) Description of *Triaenocorypha Dohertii*, the type of a new genus and species of Mantodea. *Annals and Magazine of Natural History*, Ser. 6, 5, 439–440, pl. 17.
- Yang, C. (1997) Four new and rare species of mantids from Yunnan China (Insecta: Mantodea). *Journal of Yunnan Agricultural University*, 12 (4), 227–233.
- Yang, C. & Wang, J. (1999) Mantodea. In: *Fauna of Insects – Fujian Province of China. Vol. 1*. Science and Technology Publisher of Fujian Province, Fuzhou, pp. 74–106.
- Yoshimoto, C.M., Gressitt, J.L. & Mitchell, C.J. (1962) Trapping of air-borne insects in the Pacific-Antarctic area, 1. *Pacific Insects*, 4 (4), 847–858.
- Zhang, G. (1986) New species of *Ceratomantis* from China (Mantidae: Oxypilinae). *Entomotaxonomia*, 8 (3), 235–236.