



Praying mantis (Mantodea: Dictyoptera) of Pakistan: A Review Based study

Waheed Ali Panhwar^{1*}, Samiyah Tasleem², Muhammad Asif³, Mehtab Alam⁴, Fozia Anwar⁵, Zaib Un Nisa¹, Nisar Ahmed Jatoui⁶, Waheed Ali Bhatti⁷

¹Department of Zoology, Shah Abdul Latif University KhairpurMirs Sindh Pakistan

²Department of Microbiology, FUUSAT-Karachi the University of Karachi.

³Department of Pharmaceutics, Faculty of Pharmacy, University of Karachi.

⁴Department of Biochemistry Azad Jammu & Azad Kashmir Medical College Muzaffarabad.

⁵Health Informatics Department COMSATS University Islamabad.

⁶Department of Zoology, Shah Abdul Latif University Khairpur.

⁷Department of Zoology, Shah Abdul Latif University Khairpur.

Corresponding Author's Email: : waheedalipanhwar11@gmail.com

ABSTRACT

Praying mantis belongs to most fascinating and colorful group of insects and are well known to mankind. Taxonomic investigation of praying mantises fauna of Pakistan started prior to the separation of Pakistan. Present is based on literature review of mantis fauna of Pakistan. Nearly 2400f praying mantis species exist worldwide under the 25 families. Of which 1261 species are described from Indo-subcontinent. Pakistan comprises 05 families i-e: Amorphoscelididae, Eremiaphilidae, Mantidae, Hymenopodidae and Empusidae of praying mantis and more than 40 species. Additionally, they are predatory group of insects feeding on diverse insects in addition to small vertebrates and they are helping in control of terrestrial ecosystem. Mantis are also used as biological control agents to control the population of pest.

Key-words: Praying mantis, Indo-subcontinent, Fauna, Small vertebrates, Review

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INTRODUCTION

Praying mantis belongs to most fascinating and colorful group of insects and are well known to mankind. They are the carnivorous group of insects actively feeding on different group of insects such as spiders, grasshoppers, flies, aphids, larvae of butterflies and moths and sometimes feeding on small vertebrates [1]. Praying mantises play a pivotal role in controlling population of severe insect pests. The mantises are familiar due to their camouflage and mimicry such as mantis species found on flowers mimic like flowers. Some species mask up (camouflage) the color patterns and attract the prey. Thus they, help in controlling the terrestrial as well as other ecosystem [2]. They are well known as "Lord's Horse" or Prophet's Horse" in Arabian countries [3]. In Sindhi it is commonly known as " Bibi Jo Ghoru".

Praying mantises are Polyneopteran group of insects falling in order Mantodea. Currently, a world database "The Mantodea Species File" (MSF) of mantodean fauna shows a facts and figures of living and fossils species of mantis. According to the Mantodeaspecies file, there are about 2400 valid species of praying mantises worldwide falling into 25 families [4]. About 1261 species of mantis have been reported from Indo-continent [5].

The systematic investigation of praying mantises fauna of Pakistan started prior to the separation of Pakistan. Wood-Mason [6] was first person to provide information about praying mantises fauna of Pakistan and discovered *Aethalochroaaffinis*, *A. spinipes* and *Taxoderopsistaurus* three new species to science. Similarly, Wood-Mason [7] continued the work and stated that Sindh is diverse region of Pakistan with great diversity of mantis. Murray [8] reported *Mantis ardifolia* which was later on synonymized as *Tenoder a ardifolia ardifolia* (Stoll) from Sindh Province of Pakistan missing locality. Uvarov[9] recorded single female of *Iris spendida* from Afghanistan. Uvarov [10] reported *Microthespis dmitriewi* Werner,

1908 from Karachi Pakistan. While continuing his work in (1992) he described a female of *Statilia ocellata* from Quetta, Baluchistan Province of Pakistan. Later, Beier [11] also recorded single female from Afghanistan.

After the separation Pakistan, the mantis fauna was not paid attention till (1994). Waganet al. [12] reported seven species of mantis from Sindh and confirmed the status of already recorded species. Beside this, they also reported male specimen of *Iris splendida* for the first time. Additionally, *Mantis religiosa*, *Parhierodula coarctata*, *Statilia ocellata*, *Iris oratoria*, *Creobroter* sp. and *Hestiasula brunneriana* were reported first time from Pakistan.

A small scale study was conducted to confirm the morphological features of already reported species [13,14]. Naeem and Yousuf [15] while studying the mantis fauna of Punjab province of Pakistan recorded 13 species of mantises including *Tenodera aridifolia*. But they were not confirmed about the species due to less work done on this fauna.

Study on mantis family Rivetinae revealed discovery of one new species i-e: *Rivetinarasheedii* Science from Pakistan [16]. Taxonomic study on the praying mantises fauna of Sindh resulted in finding of three families i-e: Family Eremiaphilidae, Family Mantidae, Family Empusidae and 14 genera *Eremiaphilia* Lefebvre, 1835, *Hubbertiella* Saussure, 1869, *Theopompulla* Giglio-Tos, 1917, *Blepharopsis* Giglio-Tos, 1917, *Empusa* Illiger, 1798, *Aethalochroa* Wood-Mason, 1877, *Hierodula* Burmeister, 1883, *Iris* Saussure, 1869, *Mantis* Linnaeus, 1758, *Microthespis* Werner, 1908, *Rivetina* Belandchoppard, 1922, *Sphodromantis* Stal, 1877, *Statilia* Stal, 1877, *Tenodera* Burmeister, 1883 and 21 species i-e: *Eremiaphilia arabica* Saussure, 1869, *Eremiaphilia laevifrons* Uvarov, 1922, *Humbertiella indica* Saussure, 1869, *Theopompula indica* n.sp., *Blepharopsis mendica* (Fabricius, 1765), *Empusa unicornis* (Linnaeus, 1857), *Aethalochroa affinis* Wood-Mason, 1889, *Hierodula coarctata* (Saussure, 1869), *Iris oratoria* (Linnaeus, 1758), *Iris radians* Uvarov, 1948, *Iris splendida* Uvarov, 1922, *Mantis religiosa* Saakbari n.sp., *Mantis religiosa* Linnaeus, 1758, *Microthespis dmitrievi* Werner, 1908, *Microthespis sindhensis* n.sp., *Rivetina fasciata* (Thunberg, 1815), *Rivetina rasheedi* n.sp. [16]. *Sphodromantis transcaucasica* (Brunner, 1878), *Statilia ocellata* Uvarov, 1922, *Tenodera aridifolia* (Stoll, 1813), *Tenodera attenuata* (Stoll, 1877) [17].

Further studies were conducted on the mantids and description of already recorded species were provided [18]. A detailed taxonomic key for the separation of families, genera and species were provided by [19]. Mantodean genus *Metallyticus* was reviewed and resulted in finding of several species from other countries only two species i-e: *Metallyticus violaceus* (one male and one female) and *Metallyticus* sp. (2 nymphs) from Pakistan [20].

Comparative study on the variation of mouthparts of seven species viz: *Sphodromantis transcaucasica*, *Tenodera attenuata*, *Mantis religiosa* Saakbari, *Aethalochroa affinis*, *Empusa unicornis*, *Blepharopsis mendica* and *Humbertiella indica* was carried out and significant differentiation were seen in labrum, labium while less differentiation was found in maxillae, mandible respectively [21]. Study on the gender identification of *Empusa unicornis*, *Hierodula transcaucasica*, *Iris oratoria*, *Rivetina baetica* and *Deiphobein fuscata* species was carried out by Fatimah et al. [22] without any photographic documentation made it clear for their studies. Taxonomic study was carried out on the genus *Iris* from single district of Sindh revealed the finding of two species viz: *Iris oratoria* (Linnaeus, 1758) and *Iris splendida* (Uvarov 1922). Their finding provided not sufficient information about the taxonomic status at genus level.

Khokhar et al. [23] reported one new species i-e: *Microthespis oderai* Science from Pakistan. Khokhar [24] carried out work on the mantodean biogeographical and biodiversity aspect from Pakistan. In his studies he reported that only five families of Mantodea occur in Pakistan i-e: Hymenopodidae, Amorphoscelididae, Eremiaphilidae, Empusidae, and Mantidae. Additionally, he provided biographical distribution of 38 species and detail description of thirty 32 species i-e: *Amorphoscelis annulicornis* Stal, 1871, *Eremiaphilia arabica* Saussure, 1869, *E. laevifrons* Uvarov, 1922, *Hestiasula brunneriana* Saussure, 1871, *Empusa pauperata* Fabricius, 1781, *E. unicornis* Linnaeus, 1763, *E. penicornis* Pallas, 1837, *Humbertiella affinis* Giglio-Tos, 1917, *H. indica* Saussure, 1869, *Ormomantis indica* Giglio-Tos, 1915, *Tenodera aridifolia* (Stoll, 1813), *T. fasciata* Olivier, 1792, *T. attenuata* Stoll, 1937, *Mantis religiosa* Linnaeus, 1758, *M. nobilis* Brunner, 1878, *M. religiosa* Saakbari Soomro, 2002, *M. religiosa* inornata Werner, 1930, *Statilia aculata* Werner, 1935, *S. ocellata* Uvarov, 1922, *Aethalochroa affinis* Wood-Mason 1889, *Blepharopsis mendica* (Fabricius, 1765), *Microthespis sindhensis* Soomro, 2002, *M. dmitrievi* Werner, 1908, *Microthespis sindhensis* Soomro, 2002, *M. oderai* Khokhar et al., 2016, *Sphodromantis transcaucasica* Brunner, 1878, *Iristiflisina* Giglio-Tos 1917, *I. splendida* Uvarov, 1922, *I. oratoria* Linnaeus, 1758, *I. radians* Uvarov, 1948, *Rivetina fasciata* Thunberg, 1815, *Hierodula coarctata* Saussure, 1889. Studies on the biology of *Tenodera attenuata* (Stoll, 1937) was carried out from Sindh and it revealed that *T. attenuata* undergoes 5 nymphal stages [25]. Gul et al. [26] working on insects associated with medicinal plants from Khyber Pakhtunkhwa province of Pakistan reported single species *Mantis*

religiosa. The information they provided was not sufficient to authenticate the presence of species. Kausar et al. [27] conducted work on the diversity and population dynamics of sugarcane invertebrates from Punjab province of Pakistan and recorded single species of praying mantis i-e: *Thesprotia graminis* Scudder, 1877.

Sixteen species viz : *Empusa unicornis* (Saussure,1871), *Blepharosis mendica* (Fabricius 1775), *Mantis religiosa* (Linnaeus,1758), *Iris splendida* (Uvarov,1922), *I. oratoria* (Linne,1758), *I. radians* (Uvarov,1930), *Archimantis monstrosa* (Wood-Mason, 1878), *A. latistyla* (Serville,1839), *A. sobrina* (Saussure,1872), , *Statiliaocellata* (Uvarov,1922), *Hierodula transcausica* (Brunner von Wattenwyl,1878), , *Deiphobeinfuscata* (Saussure,1870), *Polyspilota eruginosa* (Goeza,1778), *Rivetina baetica* (Rambur,1839), *Eremiaphila arabica* (Saussure,1871) and *Humbertiella indica* (Saussure,1869) under 12 genera and 05 families were reported from district Sanghar of Sindh Pakistan[28]. Khan et al. [29] While surveying the insect pests of ornamental plants recorded a single species i-e: *Sphodromantis viridis* (Bur) from Pakistan. Araet et al. [30] reported *Hierodula patellifera* from Balochistan province of Pakistan. Recently, Shar and Panhwar [31] recorded *Rhomboderella scutata*, Boliver, 1889 for the first time from Pakistan. In addition to this, they gave detail description of species along with photograph of habitus. Praying mantis are yet less explored in Pakistan and are needed to be explored. Beside this, there are so many taxonomic confusion in identity of some of species that must be verified in nearer future. Hopefully, this review based study will bring taxonomists attention to this group so as to verify the described species and further explore this less known group of insects from this region.

CONCLUSION

The prime objective of this review was to investigate the diversity, distribution, studies conducted on mantis from different areas of Pakistan before separation of Pakistan till up-to-date. The diversity of mantis have supremacy in Pakistan and are well-adapted to dry climates as well as the temperate zones of Pakistan.

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