Entomology

Two new records of rivetinidae (dictyoptera: mantodea) of Sindh, Pakistan

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Abstract

Mantids are group a polyneopteran carnivorous insects. Key agent of natural and biological control many pest insects. Aim of present study to confirm occurrence of three species of family Rivetinidae first time from this region. Collected specimens of family Rivetinidae during the course of a field surveys various districts of Sindh, Pakistan in the year from 2019-2021. *Rivetinula fraterna* (Saussure, 1871), *Microthespis evansi* (Uvarov, 1931) and *Deiphobe brunneri* (Saussure, 1871). Further information on habitats, host plants and morphological characteristics and morphometric were observed.

Keywords: records, rivetinidae, polyneopteran, agent, sindh

Introduction

Mantids are a group of polyneopteran carnivorous insects distributed worldwide from the sub-tropical, tropical, rain forest and desert aears. Over 2500 valid species and sub-species of mantids, belongs to 454 genera, assigned 33 families, out of three fossil families data available on (MSF) Mantodea species file version 5.0/5.0. Earlier (Soomro, 2000), (Ehramm, 2002), (Fatima, 2017), (Fatimah *et al.*, 2018) [1-4] were classified subfamily Rivetininae and subfamily Deiphobinae in family Mantidae. (Schwarz and Roy, 2019) [5] given Rivetinidae as family at first. Rivetinidae includes 2 subfamilies, 4 tribes, 13 genera and 71 species. Mantids are ambush predatory insects feeding various other insects. i.e Jassids, aphids, leafhoppers, mosquitoes, grasshoppers, caterpillars, psyllids and very beneficial for terrestrial habitats in control noxious pest insects (Prete *et al*., 1999) [6]. Mantids are hemimetabolous insects and completes their life cycle in three stages i.e egg, nymph and adult. Mantids nymphal stage closely resembles to adult stage, but shape, size and color are change. These creatures are very swift, flexible and agile. Their jumping ability is amazing. They can jump on and from a high place and still maintain a balanced stance. Weaponized front legs, they better change these creatures' names to praying mantis, as they are great hunters. (Beckman and Lawrence, 2003), (Sathe and Vaishali, 2014) [7, 8]. suicidal reproductive life female can resolve to eat its partner during a mating process, it can bite off the male's head and then consume the body to gain nutrients and boost fertility. This cannibalistic behavior is not usually the care, but it shows the sacrificial lifestyle of the male. (Barry *et al*., 2008) (Barry, 2013) [9, 10] they can detect movements 60 feet away from them, but their vision becomes less efficient during the night time, so most of their huntings are done during the day (Cott, 1957), (Crane, 1952), (Bedford, 1978), (Edmunds and Brunner, 1999) [11, 12,13, 14].

Materials and Methods

During the year 2019 to 2021, we were collected mantids samples from various locatilies of Sindh, Pakistan. Specimens were collected with hand picking method and insect net. For identification of specimens, we were followed schemes given by (Ehrmann *et al*., 2015), (Fatimah *et al*., 2016) (Mantodea species file) [15, 16, 17]. Illustration were with camera lucida fitted on a microscope (Ernst Leitz Wetzlar Germany 545187) and photographs of specimens were taken by Canon Eos Rebel SL3/ EOS 250D. Measurements of selected body parts were calculated in millimetres (mm) using the microscope (Oculas), 10 × 10 graph, compass, divider, and ruler.

Study area

Sindh province is located on the western corner of South Asia. Sindh lies between Latitude 25.8943° N, and Longitude 68.5247° E. Sindh land of various agricultural crops. Field surveys were arranged in the morning and evening time. All specimens were collected from different localities of Sindh, Pakistan.

Results

Order mantodea
Superfamily eremiaphiloidea
Family rivetinidae
Subfamily rivetininae
Tribe rivetinini
Genus rivetinula la greca, 1977
Species *rivetinula fraterna* saussure, 1871

Morphological Characteristics

Body long, stout, very robust, wood-brown or dirty grey in colour. Head widely triangular in shape, globular eyes, ommatidium prominent, front facial shield elevated and broad, antennae long and thick, no carina, and vertex faintly concave. Pronotum long and elongated oval, sturdy with denticulations, pronotum jointed, vertex oval in shape, mid margin of pronotum much wider than anterior and posterior, metazona expanded from lateral region, two ventral plates of the

prothorax with oblique girdles. Seven or eight spines on inner side of coxa almost same size and shape, femora lateral inner side straight and external roundly curved in shape with numerous spines, femora narrow and shorter than pronotum, coxa shorter and narrow than femur. Brachypterous wings, wood-brown colouration, contrasted with pale white crescent-shaped spot at apex, hind wing eye spot shorter and rounded in shape. Abdomen wider and solid, elongated sub-genital plate.

Morphometry

Female

LH. 3.37 ± 0.38 (mm), LA. 27.57 ± 0.40 (mm), LP. 18.7 ± 0.46 (mm), LAB. 38.72 ± 0.48 (mm), LT. 23.57 ± 0.33 (mm), WT. 8.27 ± 0.12 (mm), LW. 20.4 ± 0.33 (mm), WW.7.9 ± 0.2 (mm), LF. 18.17 ± 0.17 (mm), WF. 3.35 ± 0.20 (mm), TBL. 68.97 ± 0.22 (mm).

Material Examined

SINDH, 3♀s Garhi Sahib Khan N 27.5725°, E 68.3816°, 1♀ Dasti N 28.0390°, E 68.4138°.

Habitat

This species is distributed in upper Sindh. *Rivetinula fraterna* commonly occurred on the host plants *Dendrocalamus strictus* (bamboo) and *Ricinus. communis* (caster bean).

Global Distribution

India, Saudi Arabia and Pakistan. (Ehrmann, 2002), (Patel and Singh, 2016) [2, 18].

Remarks

This species was reported for the first time from India Saussure (1871a) [19] after more than 100 years, (Ehrmann, 2002), [2] reported this species from India and Saudi Arabia. (Mukharjee *et al*., 2005) [20] also reported this species from west India. We have collected specimens of this species, first time from Pakistan. (Mukharjee *et al*., 2005) [20] did not mention any sharp apical spines on the mid and hind femora, but (Ehrmann, 2002), (La Grace, 1977) [2, 21] observed sharp apical spines at mid and hind femora. During present study, no evidence any apical spines on mid and hind femur.

Genus *microthespis* (Werner, 1908)

***Microthespis evansi* (Uvarov, 1931)**

Microthespis evansi (Uvarov, 1931):418

Microthespis evansi (Marshall, 1975):312.

Microthespis Evansi (Soomro, NM; Soomero, MH; Wagan, MS, 2002)22:99-100.

Morphological Characteristics

Body small, slender, male yellowish brown, female dark brown, heavy than male, head board, facial shield kite in shape, smooth surface with superior edges domed big bulging eyes globular, antennae elongated, thin, pronotum short no evident of crenulations, faintly wider at center, metazona once in half times elongated than prozona, metazona cordated or cordiform shaped narrow posterior side, dialation supra coxal, prosternum dark brown blotch lower margin, pronotum slightly longer in length from coxae, coxae with 06 Sharp spines internal side, femora much longer than pronotum, at tibiae 11-12 inner, 11-13 outer spines, wings extended slightly cover tip of the abdomen, smoky brown, tegmina oval in shape at tip, costal area semi- transparent, discoidal area transparent also transparent hind wings dark brown texture, creamy or off white eye patch at apex, sub-genital plate broad than supra genital plate.

Morphometry

Male

LH**.** 1.4 (mm), LA. 10.1 ± 0.46 (mm), LP. 7 (mm), LAB. 18.5 (mm), LT. 18.7 (mm), WT. 6.2 (mm), LW. 17.2 (mm), WW. 9.3 (mm), LF. 8.2 (mm), WF. 2.3 (mm), TBL. 30 (mm).

Female

LH**.** 1.53 ± 0.057 (mm), LA. 9.63 ± 0.46 (mm), LP. 7.13 ± 0.057 (mm), LAB. 18.1 ± 0.1 (mm), LT. 18.46 ± 0.057 (mm), WT. 6.03 ± 0.0.57 (mm), LW. 17.06 ± 0.11 (mm), WW. 9.03 ± 0.057 (mm), LF. 8.06 ± 0.057 (mm), WF. 2.23 ± 0.057 (mm), TBL. 29.03 ± 0.057 (mm).

Material Examined

Sindh, 1♂, 1♀ Bangul Dero N 27.5639°, E 68.1251°, 1♀ Dakhan N 27.95°, E 68.63°, 1♀ Bero Chandio N 27.5789°, E 68.1161°.

Habitat

Microthespis evansi (Uvarov, 1931) rarely distributed in fields of upper Sindh Pakistan. *Rosa damascene* (Rose) and *Hibiscus rosa-sinensis* (China rose) are host plants.

Global Distribution

Pakistan (Patel and Singh, 2016) [18].

Remarks

This species very poorly distributed globally as far as from this region. Earlier (Soomro *et al*., 2002) [22] reported 01 female specimen from unidentified locality lower Sindh Pakistan. At present study I have been collected 03 females and 01 male specimen, first time from District Larkana and Shikarpur, upper Sindh Pakistan.

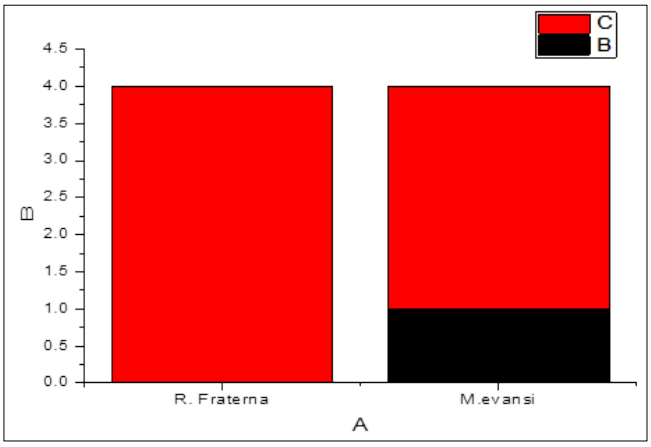

Fig 1: Showing male and female numbers of collected species

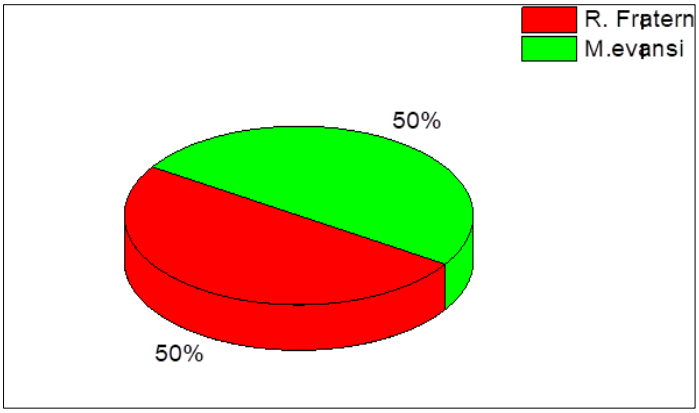

Fig 2: Showing total number of specimens were collected *R. fraterna* and *Microthepsis evansi*

(a) D.V of *Rivetinula fraternal* (Saussure, 1871) ♀ (b) D.V of *Microthepsis evansi* (Uvarov, 1931) ♂ (c) D.V of *Microthepsis evansi* (Uvarov, 1931)♀

Fig 3: Numbers of male and female collected specimens of *Rivetinula fraterna, Deiphobe brunneri* and *Microthespis evansi*

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