

Morphological Studies and Classification of Mantis of Genus *Gongylus* Thanberg

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Abstract: The present study was conducted to study the Praying mantids (Mantodea) from Mangaon area in relation to their morphological characteristics and classification. Here focussed was only on one species of Mantis. Mantids play both positive and negative roles in ecosystem. Mantids are generally large insects ranging in size from 1 cm to more than 17 cm. Females are usually larger than males. The two front legs of mantids are highly specialized for catching the prey and during hunting they assume a praying position, folding the front legs under their head, hence derived the name 'Praying Mantis'. Globally 2400 species of mantids are known belonging to 142 genera and 18 families. A total 162 species exist in India belonging to 68 genera. The study was conducted in rainy season of 2021 from June to September in Mangaon area. Around 35 Mantids were collected belonging to Empusidae Family, and Genus *Gongylus* Thanberg found in grassland ecosystem.

Keywords: *Gongylus* Thanberg, Praying Mantis, Mangaon

I. INTRODUCTION

Mantids, popularly called 'Praying mantids' are insects classified under the order Mantodea of class -Insecta in Phylum -Arthropoda. These are insects of economic importance, playing both positive and negative roles in the terrestrial ecosystem. They help in the control of noxious insect pests like aphids, crickets, moths, small birds, butterflies and even their own species because they are cannibalistic organism. The two front legs of mantids are highly specialized for catching the prey and during hunting they assume a praying position, folding the front legs under their head, hence derived the name 'Praying Mantis' (Sureshan 2009). The order Mantodea are associated with forest and agro ecosystems (Mukherjee et al. 1985 ; Mukherjee et al. 1993). These Insects show vivid behaviour, They can be seen on flowers, vegetation, twigs, , grass. Leaves and on walls as well as in homes. Except the rotation of their head, they generally remain motionless. Their food includes flying insects like aphids, grasshoppers, butterflies, moths, small birds and other insects. Mantids have enormous appetites, eating various aphids, leafhoppers, mosquitoes, caterpillars and other soft-bodied insects when young and later they eat even larger insects such as beetles, grasshoppers, crickets, other pest insects and even small vertebrates like mice, small birds, lizards and frogs. (Shveta Patel et al. 2016). Camouflage coloration allows mantids to blend in with the background as they sit on twigs and stems waiting to ambush prey. They use front legs to strike out and capture their prey. Long sharp spines on the upper insides of their legs allow them to hold their prey firmly. The impaled prey is held firmly in place while being eaten. Known for being cannibals, mantids consume each other if the opportunity arises. Large eyes and extraordinarily quick foreleg strikes enable them to capture prey in 1/20 of a second. Various observations were made on the ecology and predatory behaviour of mantids (Frederick et al., 1999, Edmund, 1972, Kramer 1960). They are known to lay eggs in complex ootheca. Mantids play an imperative role as prey and predator to maintain the balance of trophic levels of food chain. These insects often remain motionless for hours, in search of prey, and only the head rotates about 180 degrees to watch any disturbances caused by flying insects. (Sathe et al. 2014). Like their relatives, mantids undergo simple or incomplete metamorphosis. Praying mantids exhibit a remarkable range of behavioural and morphological adaptations associated with their habitat-specific predatory lifestyle. (Shveta Patel et al. 2016). They also vary in colour which is useful for their defence or capture strategies. The variation in size, shape and colour of mantids provide remarkable camouflage. *Pseudopogonogaster* Beier, 1942 have abdominal lobes that make them invisible in the substrates where they live (Fatimah et al. 2016), the member of Acanthopidae resemble dead leaves (Revera 2016) while *Hymenopus* is remarkably camouflaged (O'Hanlon 2013).

II. MATERIALS AND METHODS

Study of mantids was carried out in Mangaon from June 2021 to Sept 2021. They were photographed with the help of mobile camera. A few were caught for time being to see their morphometric and were released afterwards. Live specimens from the field were photographed, so that natural colouration and specific behavioural postures can be documented. The specimens of mantids were then processed for identification. The initial identification, of the praying mantids was done with the help of the keys of state fauna services of Zoological Survey of India and various research papers. Measurement of their fore wing, hind wing and abdomen with the help of vernier calliper.

Species: *Gongylus gongylodes* (Linnaeus, 1758)

III. REVIEW OF LITERATURE

Thus, the mantids are the only known insect group that can turn its head and look over its shoulder. *Mantids* lie in wait for their food and when close enough, snap it up with a lightning movement of their strong raptorial forelegs (Rossel at.el. 1996). Some *mantids* have a visual range of up to 20 m (Lelito at.el.2008). Praying mantids vary in size, from less than 10 mm (*Gonypetyllis semuncialis* Wood-Mason, 1891 and *Oligonicella brunneri* (Saussure, 1871)] up to 10 cm (*Macromantis ovalifolia* (Stoll, 1813) (Fatimah at.el.2016). They also vary in colour which is useful for their defence or capture strategies. The variation in size, shape and colour of mantids provide remarkable camouflage. *Pseudopogonogaster* Beier, 1942 have abdominal lobes that make them invisible in the substrates where they live (Revera at.el.2016). The member of *Acanthopidae* resemble dead leaves (Revera at.el. 2016). While *Hymenopus* is remarkably camouflaged (O'Hanlon at.el. 2013). some earlier works carried out on the Mantid fauna of the region. Mukherjee et al., (1995) who reported 14 genera and 17 species of Mantid from Maharashtra. There is also a list of 11 Mantid species from Sanjay Gandhi National Park, Mumbai (Chaturvedi et al., 2000). Jadhav et al., (2006) recorded 19 species from Pench National park, Maharashtra. Ghate and Ranade, (2002) reported 29 species of Mantid from Pune (Western Ghats) and other regions of Maharashtra. Sureshan et al., (2007) reported 33 species of Mantid with some new records from the Orissa. Vyjayandi (2007) studied on the mantid fauna of Kerala and reported 66 species.

Morphological Description

This species known as the wandering violin mantis, ornate mantis or Indian Rose Mantis Colour: brown, yellow or yellowish green; Head: small, vertex with protuberance; Antenna: filiform in the case of female and pectinate in male; Fore legs and Hindlegs: slender, coxa with external lobes; femur with distal, triangular lobe dorsally and semicircular lobe ventrally; Wings: well developed; in males wings longer and in female shorter than metasoma (Patel at.el.2018).

Plesiotype: Female, Body Length 98 mm.

Colour: Yellow (Like daed leaf)

Head: Conical, compressed, with anteriorly prolonged foliaceous lobes; eyes oval ~ frontal sclerite spiniform, as high as wide, with rhomboidal carinated disc; antenna filiform, short and non ciliated.

Pronotum : Slender, longer than fore coxa, anteriorly with rhomboidal dialation extending from anterior tip to upper one third of metazona. Fore legs: coxa simple, middorsally carinated, apical lobes conical, backwardly directed, trochanter slender; femur foliaceous, deeply grooved ventrally, with 5 external, 4 discoidal, 8-9 long internal, 20 short internal spines, one longer internal spine alternates with 3-4 shorter spines; femur longer than coxa. Middle and hind legs: coxa short, femur with distal dorsal triangular lobe and with ventral semicircular lobes.

Abdomen: Broad, laterally laminated, longer than wings, carinated. supra anal plate short. cerci short.

Male: A little shorter than female; fore wings extended beyond the abdomen, but it is reduced in female. body length 82 mm.

Order: *Mantodea*

Family: *Mantidae*

Family : *Empusidae*

Medium to large and slender mantids. Vertex with a process. Antennae combed in male.

Fore femora with 5 external and 4-5 discoidal spines, internal spines arranged in groups of 3-4 smaller and then 1 larger spine.

Abdominal segments usually with lobular expansions.

Subfamily: *Empusinae*

Pronotum slender, fore coxa with a spiniform projection at distal end.

Two genera are known from Orissa.

Key to the genera

1. Superior lobe of fore femora highly dilated; middle and hind femora with dorsallobes

Gongylus Thunberg

Genus *Gongylus* Thunberg

Diagnostic characters: Body bizarre shaped, color brown. Antennae filiform infemale and pectinate in male. Vertex with protuberance. Pronotum slender, anterior partexpanded and foliaceous Fore legs with coxae slender, superior distal angle prolongedin to a spiniform projection. Femora with 4 discoidal and 5 external spines. In middleand hind legs femur with distal triangular lobe dorsally and semicircular lobe ventrally.Forewing well developed. Abdominal segments laterally expanded.

Key to the species

1. Dilation of pronotum rhomboidal, width about one-third the length of pronotuln,lateral angles sharp

G. gongylodes (Linnaeus)

***Gongylus gongylodes* (Linnaeus)**

Diagnostic Characters: Body greenish brown. Forewing extending beyond abdomen, wide; costal area abruptly widened at base and brownish opaque; discoidal area hyaline. Hind wing as long as fore wing, hyaline and brownish near apex. Vertex ex tenucd. Pronotum long, with rhomboidal expansion. In fore legs, coxae externally with brown bands, internally black, spinules are present externally; spine present near the trochanter. Femora with brown bands, dilated, 5 external spines and 4 discoidal spines, all spines black at tip only. In mid and hind legs femora has lobes at the distal end, ventral onekrounded and dorsal lobe triangular and two in number. Mid abdominal segments laterally foliacious with ventrally transverse black marks.

IV. RESULT AND DISCUSSION

All of 5 species of *Gongylus gongylodes* (Linnaeus) belonging to genus *Gongylus* Thunberg are reported from Mangan. All were compared with morphological characters and few measurements. All the characters were almost same except male and females. 2 males and 3 females were found. Present species differs in following manners:

Measurements

Gongylus gongylodes (Linnaeus): (M:BL: (Excluding protuberance of vertex) 72-76; FW: 46-48; PN: 33-35 (Koli at.el 2011) but differs in measurements: BL-78 mm, PL-42 mm, FC-22 mm and FF-15 mm. In present species protuberance of vertex smaller than *G. gongylodes*.

In

Gongylus trachelophyllus Burmeister Foliaceous pronotum wider than long, extending more than one third length of pronotum, lateral angles rounded. In fore legs tibiae with 2 brownish bands externally, internally black at distal end, femora externally with 2-3 faint brownish bands. Protuberance of vertex longer than *G gongylodes* (Sureshan.2009).

Empussa guttula (Thunberg): Measurements: BL-55 mm, PL-25 mm, FC-13 mm and FF-15 mm (Koli at.el 2011).

V. CONCLUSION

As Mangaon is situated in Konkan region, it has rich diversity of Plants and animals. But few areas are covered with fields harbouring many insects. The present species is reported first time from this area but only a handful because this area has undergone road construction, so many areas were deforested.



Fig:1 *Gongylus gongylodes* (Linnaeus)



Fig:2 *Gongylus gongylodes* (Linnaeus)

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