Rec. zool. Surv. India: Vol. 117(3)/ 264-273, 2017
DOI: 10.26515/rzsi/v117/i3/2017/120969

ISSN (Online) : (Applied for)
ISSN (Print) : 0375-1511

Additional records of Mantodea and Phasmida from Andaman and Nicobar Islands

G. Srinivasan[1*], C. Surendar[1], Parbati Chatterjee[2] and Tushar Kanti Mukherjee[3]

[1]Zoological Survey of India, Marine Biology Regional Centre, 130, Santhome High Road, Mylapore, Chennai – 600004, Tamil Nadu, India; gurusrinivasanzsi@gmail.com, surendar703@gmail.com
[2]Vidyasagar Evening College, Kolkata – 700006, West Bengal, India; uparbati@yahoo.co.in
[3]65A/6, Swinhoe Lane, Kolkata, West Bengal, India; mukherjee.tushar@gmail.com

Abstract

Mantids belonging to 5 genera and 6 species (3 species new record) and phasmids belonging to 3 genera and 4 species (2 species new record) were collected from the islands of Andaman and Nicobar.

Keywords: Andaman and Nicobar islands, Mantodea, Phasmida, Records

Introduction

The Zoological Survey of India undertook surveys in the islands of Andaman and Nicobar in 2013-14 and 2016 for the mantids and phasmids. During these surveys, 6 species of mantids belonging to 5 genera were collected of which 2 genera and 3 species are new record. The phasmids collected during the surveys belonged to 3 genera and 4 species of which 1 genus, 1 subgenus and 2 species are new record from the islands. All new records are marked by*. All the specimens are present at the Orthoptera Section, Zoological Survey of India, Kolkata.

Mantids are predatory insects and are easily recognized by their elongated body equipped with raptorial fore legs, power to camouflage and diurnal foraging activity. According to Mukherjee *et al.,* (2014), 71 genera and 169 species are known from India including 60 endemic species. According to Ehrmann (2002), the world record of mantids was 2300 species belonging to 434 genera.

According to Sureshan *et al.,* (2004) *Acromantis montana* Giglio-Tos, 1915 *Statilia maculata* (Thunberg, 1784) were new to the islands. According to Mukherjee *et* al., (2014), so far 5 genera and 8 species of mantids are reported from the islands. These are: *Acromantis montana* Giglio-Tos, 1915, *Acromantis nicobarica* Mukherjee, 1995, *Tenodera superstitiosa superstitiosa* (Fabricius, 1781), *Hierodula tenuidentata* Saussure, 1869, *Hierodula nicobarica* Mukherjee, 1995, *Mesopteryx robusta* Wood-Mason, 1882, *Statilia apicalis* (Saussure, 1871) and *Statilia maculata* (Thunberg, 1784).

Phasmids are very timid, slow walking, nocturnal, herbivorous stick-like insects. They have great power to mimic and perfectly blend with the environment to avoid predation. The knowledge on Indian phasmids is scanty and fragmentary. Otte *et al*., (2003) published the first complete catalog of the world's stick and leaf insects. The authors listed 523 genera and 2822 species throughout the world. Shishodia (1998) mentioned that there are 146 species known to India. A preliminary study (unpublished) reveals that the number of Indian stick insects is 140 species belonging to 42 genera. The number is an approximation only because of incomplete information and doubtful locality.

According to literatures (Redtenbacher, 1906; Wood-Mason, 1876; Wood-Mason, 1873 and Brunner von Wattenwyl, 1893), 6 genera and 6 species of stick insects are known from these islands. They are *Abrosoma virescens* Redtenbacher, 1906 (doubtful as per Phasmid Species File Online), *Lonchodes verrucifer* Wood-Mason, 1876, *Ramulus westwoodii* (Wood-Mason, 1873), *Sceptrophasma hispidulum* Wood-Mason, 1873, *Trachythorax atrosignatus* (Brunner von Wattenwyl, 1893) and *Phyllium (Phyllium) westwoodii* Wood-Mason, 1875.

* *Author for correspondence*

Article Received on: 30.01.2017

Accepted on: 04.10.2017

The sunlight could penetrate the thick forest from 9 am to 12.30 pm. Collections were attempted early morning between 2.30 am to 4.00 am., between 7.30 am to 12.00 noon and also at 7.30 pm to 10.30 pm by light trap method.

Taxonomy

Class INSECTA
Order MANTODEA Latreille, 1802
Subfamily HYMENOPODINAE Giglio-Tos, 1915
Tribe **Anaxarchini** Giglio-Tos, 1919
1. *Anaxarcha graminea* Stal, 1877* (Figure 1, male).

1877. *Anaxarcha graminea* Stål, *Svenska Vetenskaps Akademien Handlingar*, Stockholm, **4** (10): 87.

Description: Abdomen ventrally light yellow. Four posterior legs pale straw coloured with scattered black spots, femora and tibiae triannulated by blackish patches, less distinct on femora; femora with a small elongated ventral lobule distally. Pronotum and fore legs uniformly pale yellow. Pronotum at margins with fine denticulation spotted black at tips. Antennal segments blackish. Frontal sclerite and vertex with scattered blackish spots; upper edge of frontal sclerite in middle sharp pointed. Both wings longer than abdomen. Length 22.5 mm; fore wing 17.0 mm.

Material examined: 3 males, 26.ii.2016, 06°80'82.7" N, 93°88'57.7" E, 18.0 m, Forest Beat House, Sastry Nagar, Great Nicobar Islands, at light, coll. G. Srinivasan.

Distribution: India: Kerala, Sikkim, West Bengal; Malayasia; Myanmar; Thailand.

Remarks: This genus and species are new record from the island.

Subfamily: ACROMANTINAE Brunner de Wattenwyl, 1893
Tribe: **Acromantini** Brunner de Wattenwyl, 1893
2. *Acromantis nicobarica* Mukherjee, 1995 (Figure 2, female).

1995. *Acromantis nicobarica* Mukherjee, *Oriental Insects*, **29**: 211, Figure 14-16.

Description: Vertex grooved, with straight upper margin. No tubercle above ocelli. Pronotum marginated by dark tubercles. Pre-apical lobes blackish in four posterior femora. Spines of fore legs black at tips. Length 26 mm.

Material *examined*: 2 males, 1 female, 26.ii.2016, 06°81'51.5" N, 93°88'32.2" E, 37 m, Forest Beat House, Sastry Nagar, Great Nicobar Islands, coll. G. Srinivasan

Distribution: India: Nicobar Island.

Subfamily: AMELINAE Westwood, 1889
3. *Memantis gardeneri*, Werner, 1935* (Figure 3, male).

1935. *Memantis gardeneri*, Werner, *Proceedings of the Zoological Society of London*, 496.

Description: Upper edge of frontal sclerite straight. Median carina of pronotum distinct. In fore legs, claw groove placed towards base; proximal two external spines close approximated. Length 25 mm.

Material examined: 1 male, 08.xii. 2013, 11°29'36.5" N, 92°42'26.3" E, 26.3 m, Chidiatapu, 25 km from Port Blair, South Andaman, coll. G. Srinivasan.

Distribution: India: Madhya Pradesh, Uttar Pradesh.

Remarks: This genus and species are new record from the island.

Subfamily: HIERODULINAE Brunner de Wattenwyl, 1893
4. *Hierodula patellifera* (Audinet-Serville, 1839)* (Figure 4, female).

1839. *Mantis patellifera* Audinet-Serville, *Histoire naturelle des Insects Orthoptères*, 185.
2014. *Hierodula patellifera*: Mukherjee, *et al*., *PRIAMUS*, No. **30**: 32.

Description: Discoidal spines black; internal spines deep brownish black; a brown band formed over the two oval spots ventral to the middle of metazona. Length of male is 56.0 and female 72.0 mm.

Material examined: 1 female, 15.iii.2016, 11°72'81.4" N & 092°65'47.6" E, 90 m, Ferrargunj, South Andaman, at light, coll. G. Srinivasan; 1 male, 07.iii.2016, 10.59'14.7" N, 92°54'14.8" E, 15 m, Hut Bay, Little Andaman, at light, coll. G. Srinivasan.

Distribution: India: Arunachal Pradesh, Bihar, Maharashtra, Madhya Pradesh, Himachal Pradesh, Kerala,

Nagaland, Tamil Nadu, Uttar Pradesh, West Bengal; China; Japan; Java; Korea; New Guinea; Philippines; Sumba; Taiwan; Vietnam.

Remarks: This species is a new record from the island.

5. *Hierodula tenuidentata* Saussure, 1869 (Figure 5, female).

1869. *Hierodula tenuidentata* Saussure, *Bulletin de la Societe entomologique, Suisse* **3**: 68.

Description: Antennae blackish. Metazona dorsally at postero-lateral points with blackish patch. Stigma pale yellow, elongated.

Material examined: 1 female, 26.ii.2016, 06°80'82.7" N, 93°88'57.7" E, 18.0 m, Forest Beat House, Sastry Nagar, Great Nicobar, at light (7.30pm - 8.30 pm), coll. G. Srinivasan.

Distribution: India: Andaman, Andhra Pradesh, Bihar, Kerala, Lakshadeep, Madhya Pradesh, Maharashtra, Orissa, Uttar Pradesh, West Bengal; Nepal; Sunda Island; Turkestan; Turkmenistan.

Remarks: Sastry Nagar is 35kms from Campbell Bay. On lower reaches of Sastry Nagar there were paddy field with human settlement and on the higher reaches there were Evergreen forests.

Subfamily: MANTINAE Burmeister, 1838

6. *Statilia maculata* (Thunberg, 1784) (Figure 6, male).

1784. *Mantis maculata* Thunberg, *Novae Insectorum Species*, **3**: 61.

2014. *Statilia maculata*: Mukherjee, *et al*., *PRIAMUS*, No. **30**: 38.

Description: Body clay coloured with scattered black and blackish spots. Vertex at summit with blackish patch; eyes dirty white with blackish line, their ventral half darker. Frontal sclerite pale blackish with a pair of round white spots. Similar paired spots present on posterior ½ of mesosternum. Pronotum dirty white with scattered with scattered blackish spots, with good supracoxal widening, distinctly carinated; metazona hardly constricted laterally in middle; antero-ventral area of metazona near coxal joint with black patch. Abdomen blackish and black spotted. In fore leg, coxa with 5-6 whitish triangular spines; claw groove yellow, a little in front of middle, a black patch at the posterior of this groove; a black line runs ventral to this groove; all spines black at tips, internal spines with a black line along bases; external spines (4) black at bases; tibia with 7 external and 10 internal spines. The middle and hinds legs are simple. Wings: Both extend the end of abdomen. In fore wing, costal area opaque, pale straw coloured, costal margin blackish; stigma pale straw coloured; discoidal and anal areas transparent; discoidal area with scattered scattered black patches; long veins pale straw coloured, cross veins with black spots at either ends; anal area and its veins colourless. In hind wing, costal and discoidal areas with colourless veins, cells near tip of discoidal area smoky; ; long veins of anal pale area with blackish bands and cells here are smoky. Length 42.0, fore wing 30.0, hind wing 27.0.

Material examined: 1 male, 03.i.2014, 12°30'14.7" N, 92°55'30.2" E, 15.0 m, Rangat, Middle Andaman, 210 km from Port Blair, at light, coll. G. Srinivasan. Sureshan *et* al. (2004) reported a male from South Andamans.

Distribution: India: Andaman Island, Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Madhya Pradesh, Maharashtra, Meghalaya, Kerala, Orissa, Sikkim, Uttar Pradesh, West Bengal; Annam; Borneo; China; Japan; Java; Labuan; Myanmar; Malayasia; Maluku Islands; Nepal; New Guinea; Palawan; Sri Lanka; Sumatra.

Order PHASMIDA

Family DIAPHEROMERIDAE Kirby, 1904

Subfamily NECROSCIINAE Brunner von Wattenwyl, 1893

Tribe **Necrosciini** Brunner von Wattenwyl, 1893

1. *Sipyloidea atricoxis* (Westwood, 1859)* (Figure 7a, b, c, male; 8a, b, female).

1859. *Necroscia atricoxis* Westwood, *Cat. Orth. British Museum*, **1**: 146, pl. 21:5.

1893. *Sipyloidea atricoxis* Brunner von Wattenwyl, *Annali del Museo Civico di Storia Naturale Giacomo Doria*, Genova (2)13(33): 87.

Description: Green male. Pale green-yellow insect. Antennae greenish black near basal segments, gradually and distally being totally blackish, joints paler. Head pale green, smooth, a little elongated, depressed, not globose. Prothorax rectangular, with very few minute granules, a black spot at postero-median end. Mesothorax carinated, covered with minute granules, pale green, very little narrowed up to the middle from front, then gradually

widened posteriorly where it is a little wider than front margin. Elytra oval elongated, hump lie in front of middle, little prominent and with a small black line; costal area uniformly pale green; anterior of anal area pale green-yellow; long veins of anal area blackish. In hind wings, costal area opaque green; long veins blackish-brown, anal area colourless. Legs are slender and smooth; fore femora incurved at base. Abdominal segments uniformly pale green both dorsally and ventrally; segments are gradually longer up to 5th and later segments are gradually shorter, segments rounded, uniformly narrow; 5-8th segments ventrally with black marks which of 8th is most distinct by being a median longitudinal patch; 5th to 9th at post-median dorsal point with a black spot; pleurae of 6th and 7th at posterior end with a black spot; 8th very little wider posteriorly; 10th segment strongly fornicate, carinated, apex nearly straight, appears constricted posteriorly where it is divided into two conical ends deflexed down laterally; last three segments finely carinated, nearly triangular. Poculum elongated boat-form, apex rounded, reaches end of 9th segment. Cerci short, tips in contact, ventrally directed extending a little from end of 10th segment. Total length 51, head 2, prothorax 2, mesothorax 9, metathorax 5, m. seg 3.6, antenna 44, elytra 3.5, hind wing 26. Fore leg 13+14+6.5, middle leg 11+10+5, hind leg 14+14+7.

The blackish male: very similar to the previous green form. Body with blackish patches on all body parts and not green at all. The area anterior to the eyes colourless with oval swelling, posterior area pale grey, post-ocular black band very distinct. Eyes round, colourless. Antennae extend beyond the end of abdomen; first two segments whitish with black marks, rest segments deep brownish to blackish. Prothorax with short paired longitudinal black marks; with very few minute blunt tubercles. Mesothorax with pale straw coloured granules scattered over the dorsal surface which are fewer in posterior half and concentrated in anterior half; with distinct carina; laterally in the middle with a pair of oblong black patch; a black line from middle backwards along lateral margin for a short distance; a pair of rounded black lined mark near posterior margin; mesosternum blackish. Metathorax and median segment: pale whitish; median segment a little more than ½ of metathorax. Abdominal segments: dorsally grey coloured with blackish single spot at distal apices of 5-9th segments, similar spots ventrally at apices of 7-8th segents only; 9th longer than 8th; 10th smaller than 8th and 3-carinated, apex divided into short rounded lobes. Ventrally, segments 6th to 9th black; poculum elongated boat-form, black with rounded apex. Elytra oblong oval, blackish, longitudinal veins deep brownish; hind margin nearly straight; hump conical, feebly black spotted, placed in front of middle; the longitudinal area in front of hump with a distinct pale greenish yellow patch. Hind wing: just exceeds 5th abdominal segment; costal area blackish with paler patches, veins deep brownish; anal area and veins colourless. In foreleg, femur smooth, blackish, incurved at base; tibia and tarsi dirty white. Middle leg and hind leg: the four posterior femora and tibiae with blackish bands. Total length 45, mesothorax 8.5, antenna 54, hind wing 25.

Materials examined: 2 males, 12.xii.2013, 11°44'27.9 N, 92°39'14.7" E, 109 m, Ferrargunj, Jarwa Reserve forest, 13 km towards north from Port Blair, South Andaman, coll. G. Srinivasan.

3 males (1 nymph), in spirit, 26.ii.2016, 06°80'82.7" N, 93°88'57.7" E, Forest Beat House, Sastry Nagar, Great Nicobar Islands, coll. G. Srinivasan.

Remarks: This species is a new record from the island. This blackish male is exactly the same as the previous green male. Thus the species distinctly shows colour variation (green-yellow and blackish form). The green form was collected from the green bush and has no black or deep brownish spot. The shape of elytra and the ventral coloration on last three segments are same in both males. The blackish form was collected from the same spot but from the forest floor. The site is covered by evergreen green rain forests with wild cane plantations and small shrubs. The forest floor is covered by small twigs which makes difficult to identify the stick insects among litter due to their camouflage. The males from Sastry Nagar have body parts green.

Female: Brown insect. Mesonotum minutely and lightly granulated, granules more restricted to anterior portion, posterior almost smooth, finely carinated, near middle with a pair of oval deep brown oblique patches. Elytra oval elongated, overall pale brown, hump black, anterior anal area pale, long veins marked by interrupted by black spots. Hind wing reaches middle of 6th abdominal segment. Abdominal segments 1-6 on both sides with paired brownish black spots; similar but single spot in the middle of metathorax; segments 3-9 additionally dorsally with a

black spot at their median extremity. Legs; all coxae black spotted at their inside; all femora and tibiae with pale brown bands. Operculum boat form, apex pointed, as long as end of supra anal plate, carinated in its distal half. Cerci short, rounded and within margin of supra anal plate. Total length 82, hind wing 45, fore leg 21+18+9.5, middle leg 12+10+7, hind leg 16+15.5+8.

Materials examined: 1 female, 6 km interior to Vivekanandpur near a nallah, 09.iii.2016, 10°73'26.0" N, 92°56'88.9" E, 1m, at light (3.30 am), coll. G. Srinivasan.

Distribution: India: Great Nicobar Islands.

Remark: It is not clear if the male was described before. There are some differences from those mentioned for the female by Westwood, 1859, pp. 146-147. These are: the antennal white rings not clearly visible; darker longitudinal lines over head absent; costa of elytra not whitish; presence of distinct spots on abdomen and the absence of distinct spot at apices of femora. In the males, coxal spot is seen in middle coxae only; femora with deep brown spot at dorsal apices, band on legs hardly visible as they are uniformly brownish; hind wing reaches end of 5th abdominal segment.

The locality of the type female is mentioned as "India oriental" which is ambiguous. Hence we consider it as a new record from the island.

2. *Sipyloidea* sp. (Figure 9a, b, c, d, e, male)

Description: Medium size insect with all body parts totally green. Antennae longer than fore leg, basal two segments of antenna brownish patched. Ocelli present. Vertex below ocelli with five longitudinal spotted bands (each band brownish with paler spots). Prothorax with few minute tubercles. Mesothorax uniformly covered by minute granules, a little constricted in middle; mesosternum with paired longitudinal grooves and carinae with tubercles. Median segment a little shorter than metathorax. Legs: all smooth, green and hairy. Fore leg distinctly incurved at base. Abdominal segments: smooth; dorsally 1-4 blackish, ventrally green; of uniform with up to 7th; 7-9th at dorsal postero-median point with shallow transverse pit; 8th wider posteriorly; 8-10 equally wide, much wider than end of 7th; 9th as long as wide; 10th is a little longer than wide, feebly carinated, divided into widely rounded lateral lobes dentate inside. Cerci up to end of 10th segment, rounded, apposite and straight. Poculum swollen, cup form, apex staright showing two strong genital spines. Elytra deep green coloured initially and later became brownish; oval, cup form and not elongated, apex straight and appears and very broadly rounded; hump obtuse and situated distal from of middle; costal area blackish but at distal part with a oblong pale patch; hump pale brown, with a blackish patch on distal slope anal area irregularly reticulated. Hind wing just exceeds the middle of 5th abdominal segment; all longitudinal veins yellow green; costal cells are opaque green basally with 2-3 pale blackish spots; distal of costal area became pale blackish (whitish in fresh condition); anal area uniformly light green to colourless. Length- 52, antenna 35, fore leg 13.5+12+6, middle leg 7+6+5, hind leg 12.5+12.5+5.5, median segment 3.5, prothorax 2, mesothorax 9.5, metathorax 7, hind wing 25.

Material examined: 1 male, at light, North Andaman, Kalighat Government Hospital, 17.06.1994, coll. K. Chandra and party, Regd. No. 8682, (Andaman Regional Station collection).

Remarks: The peculiar characters of the species are interesting. These are: presence of ocelli; green colour, sulcated dorsal hinder margin of segments 7-9th; 10th segment being carinated, obtuse divided, lobes conical and laterally deflexed down and poculum cup form, apex carinated conical.

Family PHASMATIDAE Leach, 1815
Subfamily CLITUMNINAE Brunner von Wattenwyl 1893
Tribe **Clitumnini** Brunner von Wattenwyl 1893
3. *Ramulus* sp. (Figure 10, female).

Description (female): Medium size, slender body, all parts of body covered by dirty white and brownish to blackish spots. Entire thorax and abdomen with a median fine carina. Head: elongated, narrowed behind, with a transverse white band in front of paired short tuberclular spine; adjoining area of spine pair is black; a median fine white line medially on vertex. Antennae 22-23 segmented; 1st one flat and oval elongated, 2nd a little longer than broad, 3rd to penultimate uniformly long; last one elongated and black; distal segments blackish with a longitudinal black line dorsally. Eyes blackish and rounded. Prothorax rectangular, a little broader behind.

Mesothorax elongated, rounded, carinated, smooth and a little wider at posterior area. Metathorax smooth. Medain segment about 1/5th of metathotax. Abdominal segment finely carinated; gradually very little longer up to 5th, 6-7th equal 9th smallest; last three segments triangular particularly 9th and 10th; 10th elongated, narrowed distally where it is bifid near tip to form two close beset conical ends; ventrally 2nd segment proximally with distinct paired white spots formed into one patch. Preopercular organ absent. Operculum whitish with longitudinal brown lines, with a median black line; proximal ½ flat, distal ½ compressed boat form, apex cone form, reaches ½ of 10th segment. Cerci short, rounded, shorter than apex of 10th segment.

Supra anal plate short, rounded, hidden beneath 10th segment. Legs: right fore leg absent and that of left deformed (due to regeneration). Rest legs without distinct bands. Hind femora and tibae smooth; middle femora smooth; left middle tibia at dorsal basal 1/4th with a small black conical lobule; right middle leg lost. Total length 70; antennae 6.5; head 4; prothorax 2.8; mesothorax 14.5; metathorax 9.5; median segment 2.5; middle leg 12.5+11.5+6; hind leg 15.5+14.8+7.

Male: the specimen is a nymph. Colouration of antennae and body similar to female. Its right fore leg lost. Entire length of body finely carinated. Head without conical tubercular spine pair (seems not yet developed); with four longitudinal brown bands on dorsal aspect of head; each band with fine whitish spots. Mesothorax and metathorax with few minute and blunt tubercles. All legs smooth; with 6-7 black bands. The five distal segments appear triangular in outline rather than round. 10th tricarinated, apex staraight and undivided. Supra-anal plate conical exposed a little beyond the end of 10th segment. Cerci triangular, extend beyond the end of 10th segment. Poculum grooved in middle; with median black line, apex divided; poculum not swollen in this spirit preserved specimen.

Materials examined: 1 female, 12.xii.2013, 11°44'27.6" N, 92°39'14.3" E, 92 m, Ferrargunj, Check post, 15 km towards north from Port Blair, South Andaman, coll. G. Srinivasan. 1 male (nymph), 13.xii. 2013, 11°43'52.3" N & 92°39'12.1" E, 102 m, Ferrargunj, South Andaman, Jarwa Reserved Forests, coll. G. Srinivasan.

Remarks: The specimen is a nymph.

Superfamily PHYLLIOIDEA Brunner von Wattenwyl, 1893
Family PHYLLIIDAE Brunner von Wattenwyl, 1893
Subfamily PHYLLIINAE Brunner von Wattenwyl, 1893
Tribe **Phylliini** Brunner von Wattenwyl, 1893
Genus ***Phyllium*** Illiger, 1798
Subgenus ***Pulchriphyllium*** Griffini, 1898

4. *Phyllium* (*Pulchriphyllium*) *bioculatum* Gray, 1832* (Figure 11a male; 11b, c, female).

1832. *Phyllium bioculatum* Gray, In Griffith & Pidgeon. The animal kingdom arranged in conformita with its organisation by the Baron Cuvier. 15:191, pl. 63:3.
2003. *Phyllium* (*Pulchriphyllium*) *bioculatum* Brock, Gale Research Staff. Grzimek's Animal Life Encyclopedia: Insects 226, Figure 1, 231.

Description: The female abdomen is somewhat similar to *Ph. (Ph.) westwoodii*. The terminal triangle is formed by last two segments which in *Ph. (Ph.) westwoodii* is by last three segments. The elytra reaches middle of 8th segment and in *Ph. (Ph.) westwoodi*, it reaches end of 7th abdominal segment. In the elytra of ♀, the ulnare and discoidal veins are almost contiguous (distinctly separated in *Ph. (Ph.) westwoodii*). Measurements: male: total length 53, antenna 27, fore wing 11, hind wing 32, max. width of abdomen 21; female: total length 85, antenna 4, fore wing 53, max. width of abdomen 42.5.

Materials examined: 1 male, 09.iii.2016, 10°73'26.0" N, 92°56'88.9" E, 1 m, 6 km interior to Vivekanandpur near a nallah, Little Andaman, at light (3.30 am), coll. G. Srinivasan; 1 male, 05.iii.2016, 10°68'25.9" N, 92°56'92.8" E, 49 m, 14 km forest check post, Little Andaman, at light (4.00 am), coll. G. Srinivasan; 1 male, Mini Bay, South Andaman, 18.9.1994, coll. H. L. Das (Andaman Regional Station collection); 1 male nymph, Bamboo flat (Ograbraj), South Andaman, 20.2.1982, coll. D. K. Hore (in bush), (Andaman Regional Station collection); 1 female, Dusnabad, Port Blair, South Andaman, 25.03.1994, coll. Smt. K. Devi (on wing), (Andaman Regional Station collection).

Distribution: India: Assam (Bragg, 2001), South Andaman and Little Andaman, (literature record is "India oriental"); Bangladesh (Sylhet); Borneo, China, Java, Mauritius, Peninsular Malaysia, Seychelles, Singapore, Sri Lanka, Sumatra.

Remarks: The subgenus and the species are new record from the islands. Indian record for this species is from

Assam and also from adjoining Sylhet of Bangladesh. However the species has been recorded from several islands nearby the present survey areas. The end of female abdomen is obtusely rounded at the junction of 7th and 8th segments. This is however, completely different in female of synonym *Phyllium magdelainei* (holotype, source PSF). Bragg (2001) and Brock (1999) have explained the situation). Similarly the length of female elytra is variable; it may reach the middle of 7th or the junction of 7th and 8th segments. The picture of male available at PSF clearly shows the length of hind wing is highly variable; in our male specimen it reaches nearly the end of abdomen. The shape of the abdomen and the three terminal segments in males studied are slightly different; the three terminal segments are smooth round in one while indented in other.

Discussion

Praying mantids and the Phasmids have been least surveyed in Andaman & Nicobar Islands and thus there is no much knowledge on the distribution pattern of these two groups of insects. The surveys were undertaken by 1st author and associates from the Orthopetera section. The first survey was undertaken from 03.12.2013 to 18.01.2014 (46 days) in South Andaman, Middle Andaman & North Andaman. The second survey was conducted from 19.02.2016 to 23.03.2016 (33 days) at Great Nicobar Islands & Little Andaman. The survey was carried out at pre- and post monsoon seasons. The Andaman & Nicobar forests are very thick and characterized by dense tall evergreen rain forests, very high canopy and thick forest floor. The floor is full of cane vegetation which makes human movement very risky and dangerous. There are many small fresh water pools. At certain places, the fresh water rivers running and joining the sea became habitat for crocodiles which makes insect survey further more dangerous, particularly for light trap collection. Some localities are quite remote and very difficult to access. However, the places are rich in insect diversity. It is highly possible to discover more species and some species may even be endemic to the islands.

Acknowledgements

The authors are grateful to the Director, Zoological Survey of India, Kolkata, for providing facilities and encouragements. GS is also thankful to Dr. C. Raghunathan, Scientist- E, and Officer-in-Charge, Andaman and Nicobar Regional Centre of Zoological Survey of India, Port Blair for his logistic supports during the Survey. The cordial assistance from O/C and staff of Orthoptera Section, Zoological Survey of India, Kolkata is also acknowledged. Finally we appreciate the assistance of the anonymous reviewer towards enrichment of this article.

References

Audinet-Serville, J.G.A. 1839. *Histoire naturelle des Insects Orthoptères*, 776 S., pls. 1-14; Paris.

Bragg, P.E. 2001. Phasmids of Borneo. 772pp. Natural History Publications (Borneo), Sabah. (Systematics)

Brunner von Wattenwyl, C. 1893. Revision du systeme des Orthopteres *et* description des especes rapportees par M. Leon Fea de Birmanie. *Annali del Museo civico di Storia naturale di Genova,* **13**(2): 1-230.

Brunner v. Wattenwyl, C. & J. Redtenbacher. 1906–1908. Die Insektenfamilie der Phasmiden I–III. Verlag von Wilhelm Engelmann. 589 pp.

Ehrmann, R. 2002. Mantodea: *Gottesanbeterinnen der Welt.* Natur und Tier-Verlag, Münster, 519 pp.

Fabricius, J.C. 1781. *Species Insectorum Mantodea and Phasmodea*. Bohn, Humburgi et Kilonii, **1**: 8–552 pp.; Humburg and Kiel.

Giglio-Tos, E. 1915. Mantidi Esotici. Generi e Specie Nuove*, Bullettino della Società entomologica Italiana*, **46**: 31–108.

Mukherjee, T.K., Hazra A.K. and Ghosh A.K. 1995. The mantid fauna of India (Insecta: Mantodea), *Oriental Insects*, **29**: 185-358.

Mukherjee, T.K., Ehrmann, R. and Chatterjee, P. 2014. Checklist of Mantodea (Insecta) from India. *PRIAMUS*, Centre for Entomological Studies, Ankara, Turkey, No. 30: 61 pp.

Otte, D. and P. Brock. 2003. A catalog of the stick and leaf insects of the world. January 21, 2003, The Orthopterists' Society, ISBN: 1-929014-03-1

Saussure, H. De. 1869. Essai d'un système des Mantides. Mitteheilungen der Schweizerischen entomologischen Gesellschaft. *Bulletin de la Societe entomologique, Suisse,* **3**: 49-73.

Saussure, H. de. 1871. Mélanges Orthoptérologiques: IV. Mantides. *Mémoires de la Société de Physique et d'Histoire Naturelle de Genève*, suppl. **21**(2): 239-337, pl. 7, Geneve.

Shishodia, M.S. 1998. *Faunal diversity of India,* (Edited by J.R.B. Alfred, A.K. Das and A.K. Sanyal), Z.S.I. publication. Phasmida: 189.

Stål, C. (1877 b) Espèces nouvelles de Phasmides. *Annales de la Société Entomologique de Belgique, Comptes Rendues*, **20**: 62–68.

Sureshan, P.M., Palot, J. Md. and Radhakrishnan, C. 2004. New Additions to the Mantid fauna (Insecta: Mantodea) of Andaman and Nicobar Islands. *Zoos' Print Journal*, **19**(7): 1544.

Thunberg, C.P. 1784**.** Dissertatio entomologica novas insectorum specis sistens, III. Mantodea. Edmann, Jahan. *Novae Insectorum Species*, **3**: 53-68, pl. 1, fig. 64-81; Uppsala.

Werner, F. 1935. Further communication on Indian mantis or praying insects. *Proceedings of the Zoological Society of London*, 495-498, 1 fig. London.

Westwood, J.O. 1848. The Cabinet of Oriental Entomology, *London.*

Westwood, J.O. 1859. Catalogue of Orthopterous insects in the collection of the British Museum. Part 1, Phasmidae. *British Museum, London*. 195 pp., 40 plates.

Wood-Mason, J. 1873. On new or little known species of Phasmidae. Part I. Genus *Bacillus*. *Journal of the Asiatic Society of Bengal,* **42**(2): 45–56, pls. 9–11.

Wood-Mason, J. 1875. On new or little known species of Phasmidae, with a brief preliminary notice of the occurance of a clasping apparatus in the males throughout the family. *Journal of the Asiatic Society of Bengal,* **44**: 215–220.

Wood-Mason. 1876. Description of a new Phasmideous Insect from the Andamans. *Journal of the Asiatic Society Bengal,* **45**: 95

Wood-Mason, J. 1882. On new and little known Mantodea, *The Journal of the Asiatic Society of Bengal*, **51**(2): 21–36.

PLATE 1

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7a

Fig. 7b

Fig. 7c

Fig. 8a

Fig. 8b

Figure 1. Anaxarcha graminea, male, **2.** Acromantis nicobarica, female, **3.** *Memantis gardeneri,* male, **4.** *Hierodula patellifera,* female, **5.** *Hierodula tenuidentata,* female, **6.** *Statilia maculata,* male, **7(a, b, c)** *Sipyloidea atricoxis*, male, Figure **8(a, b)** *Sipyloidea atricoxis*, female.

PLATE 2

Fig. 9a

Fig. 9b

Fig. 9c

Fig. 9d

Fig. 9e

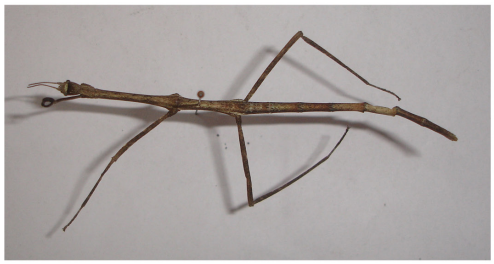

Fig. 10

Fig. 11a

Fig. 11b

Fig. 11c

Figure 9(a, b, c, d, e). *Sipyloidea* sp., male, **10.** *Ramulus* sp., female, **11a.** *Ph. (Pul.) bioculatum*, male, **11(b, c).** *Ph. (Pul.) bioculatum*, female.