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COMMUNICATION

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TWENTY-THREE NEW RECORDS OF MANTODEA (INSECTA) FROM SOME STATES OF INDIA

Tushar Kanti Mukherjee¹, Geetha Iyer² & Parbati Chatterjee³

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¹65A/6, Swinhoe Lane, Kolkata, West Bengal 700042, India

²Consultant- Education, Suchindrum, Tamil Nadu 629704, India

³Vidyasagar Evening College, Kolkata, West Bengal 700006, India

¹mukherjee.tushar@gmail.com (corresponding author), ²scopsowl@gmail.com, ³uparbati@yahoo.co.in

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Abstract: Photography of mantises in their natural habitat clearly indicates the presence of a good number of species in our country. The study disclosed new records of 23 species of mantises from different forests and rural greens of India. Photographs are also provided. All photographs, unless specified otherwise, are by Geetha Iyer. None of the mantises were collected.

Keywords: India, Mantodea, new records.

Abbreviations: BR – Biosphere Reserve; IB – Inspection Bungalow; NP - National Park; RF – Reserve Forest; SNIS - Sreenidhi International School; TR - Tiger Reserve; WS - Wildlife Sanctuary.

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Author Details: TUSHAR KANTI MUKHERJEE - retired as Associate Professor of Zoology from Presidency University, Kolkata in 2012. Actively engaged in taxonomy of Mantids and Stick insects till date. Published more than 55 articles and books in national and international journals. GEETHA IYER - A teacher at heart, she is deeply involved in matters of school education and works and volunteers as an independent consultant in the twin fields of education and environment. Author of the book, "The Weavers. The curious world of insects". Writes for Teacher Plus on bringing biodiversity into the classroom; on insects for the magazine Frontline. Author of two text books on Environment Education; series Editor of middle school science text books, "Science Now" and a nature photographer with an avid interest on entomofauna. PARBATI CHATTERJEE - as a lecturer of Zoology in a Kolkata based college, she has to undertake regular tour to semi-urban and natural forests. Working on taxonomy of mantids for about eight years. Published more than 12 articles.

Author Contribution: TKM - identification and compilation of materials and correspondence. GI - photography of insects through travel to various localities and contributed to the writing of the article particularly the introductory paragraphs and description of localities. PC - identification, observational input, Photoshop works.

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INTRODUCTION

The mantises or mantes are among the most charismatic carnivorous insects. There are 15 families of mantises found worldwide (Ehrmann, 2002). Largely predatory, their diet is not limited to feeding only on insects; adult mantises are known to prey upon fish, frogs, lizards, small birds and mammals (Frederick, 1999). Cannibalism among self or other species is natural to maintain territory and as a part of mating. In the wild, they are part of those important groups of organisms that serve to keep a check on phytophagous insects. Hence it is in the interest of science to further the knowledge of their diversity and take steps to ensure that their populations and diversity are conserved. Their territorial behavior and loss of habitat, however, have resulted in their decline. Taxonomic interest in this group is also limited worldwide and in truth an active decline in their systematics is a matter of concern for those who study these fascinating creatures. The number of researchers in India studying these insects is few. Contributions to the taxonomy of mantises of India in recent time have been largely due to the studies carried out by taxonomists such as H. V. Ghatge, P. M. Sureshan, T. K. Mukherjee, P. Chatterjee, and M. C. Vyjayandi. There still remain large areas of this country from where information about mantises is scant. This paper is an attempt to record the diversity of mantises from some select states of India.

According to Mukherjee *et al.* (2014), the Indian mantises belong to 11 families, 26 subfamilies, six tribes, 71 genera and 169 species of which 60 species are endemic. Many of the mantises recorded in this paper were photographed when they came to light screens set up for the survey of moths and other insects. Some were photographed during daytime surveys. All mantises recorded in this paper are photo documentation of live specimens.

Through this attempt, eight families, 20 subfamilies, five tribes, 26 genera and 30 species have been recognized mostly in different forests and some in urban and rural areas. This study also revealed that out of the 30 species, 23 species from six families, 14 subfamilies and four tribes are first-time records for several states of India. The high percentage of genera compared to the number of species clearly indicates a healthy existence of mantises in our different ecosystems. The absence of records of many species is largely due to the difficulties faced in obtaining permission to visit and/or collect insects in most of the forests and, in several instances, the non-availability of funds for research in basic science

and a paucity of taxonomists.

MATERIALS AND METHODS

The insects were seen preying on moths that came to light screens set up to study moths. Attempts were also made to view during the morning hours, which coincide with their feeding period. The temperatures in all places were comfortably cool and weather was sunny. Although in most cases the fringe areas of forests were chosen for exploration and also to avoid wild animals, some of the species reported from Kanyakumari WS are from the interiors of semi-evergreen forest. Since no permission was available to collect them, the only means to study was through good photography, a less than ideal methodology. The locality data, and latitude and longitude of spots were noted. In some cases the photographs were not adequate to determine the sex of the insects. Most of the specimens from the forested areas were photographed in 2010–2014 during the pre- (April to June) and post-monsoon (November to March) periods. Those from the Rishi Valley School and Sahyadri School campuses were photographed between the late 1990s and early 2000s, respectively. Mantises studied from educational campuses were located near water bodies at institutions that were sensitive to conservation and maintained extensive areas of wilderness. The habitats in which these mantids were photographed ranged from dry scrub to mixed deciduous, evergreen and riparian forests. The specimens from rural areas were predominantly from habitats next to agrarian and wetland ecosystems. All photographs were taken using digital bridge cameras. Panasonic DMC-FZ35 was used for most photographs while a few were taken using Olympus C55Z. The distribution record mentioned is based on earlier work by Mukherjee *et al.* (2014)

Localities surveyed

Andhra Pradesh: Chittoor District: Rishi Valley School campus, 13°29'N & 79°57'E. Year: 2006. Rain deficient area with scrub and dry deciduous vegetation. Active measures for habitat conservation are undertaken around the school campus area.

Arunachal Pradesh: West Kameng District: (1) Eaglesnest WS - Khellong RF, 27°1'N & 92°4'E, elevation 800m, years 2004 and 2012; (2) Pakke Tiger Reserve (PTR) – (i) Langka RF, 27°1'N & 92°02'E, years 2011–2013, tropical semi-evergreen forest; (ii) Seijosa eco camp and Seijosa IB, 27°1'N & 92°39'E, years 2011–2013, Assam valley tropical semi-evergreen forest.

East Kameng District: Seijosa Sub-division: Pakke-Kessang, buffer area of Pakke TR, 27°11'N & 93°17'E, elevation 1432m, year 2013, tropical evergreen forests.

Maharashtra: Khed District: Tiwai Hill: Sahyadri School campus 18°59'N & 73°45'E; Tiwai Hill: rain shadow region of Deccan, a plateau surrounded by hills and water bodies, predominantly scrub and a fairly dense forest of teak and jambul on slopes, green campus due to active plantation programme, elevation 770m, year 2004–2005.

Meghalaya: West Garo Hills: mixed forest due to Jhoom practices; most places that are on the periphery of these protected areas are secondary predominantly tropical evergreen forests (i) Balpakram NP, 25°51'N & 90°20'E, year 2012, (ii) Siju WS, 25°30'N & 90°35'E, year 2012; (iii) Nokrek NP, 25°53'N & 90°11'E, year 2012.

Rajasthan: Jaisalmer District, desert ecosystem, this one specimen was photographed adjacent to the Sam dunes, 26°50'N, 70°31'E, year 2006; observed foraging in bushes during day time in the desert.

Tamil Nadu: Coimbatore District: (i) Anaikatti: Campus of Vidya Vanam School, 11°11'N & 76°74'E, year 2014, mixed forest surrounds the school, the campus does not have any original flora but more of the horticultural type, a few trees common to that region are present, (ii) Semmedu: Campus of Isha Home School, 10°58'N & 76°44'E, year 2008, located at the foot hills of Velliangiri mountains which is part of the Nilgiri BR, the campus has mostly horticultural flora, palms and a few trees.

Kanyakumari District: (1) Suchindram Village- 8°15'N & 77°46'E, year 2006, agrarian ecosystem and water bodies, (2) Kanyakumari WS, year 2011–2014, the areas where mantises were photographed are –(i) Balamore Estate: 8°28'N & 77°23'E, plantation and moist deciduous forests, (ii) Kalikesam: 8°41'N & 77°39'E, riparian, (iii) Maaramalai: 8°26'N & 77°24'E, moist/wet deciduous, (iv) Samikucchi: 8°24'N & 77°26'E, moist deciduous, small areas of semi-evergreen and patches of shola, (3) Kanyakumari and Tirunelveli districts: Kalakkad-Mundanthurai TR, year 2011–2014, (i) Sengaltheri: 8°32'N & 77°27'E, mix of evergreen, semi-evergreen and moist deciduous forests, (ii) Kannikatti: 8°39'N & 77°15'E, mix of evergreen, semi-evergreen and moist deciduous forests, (iii) Kuthiraivetti: 8°59'N & 77°35'E, evergreen, semi-evergreen, mixed deciduous and tea plantations, (iv) Mundanturai: 8°40'N & 77°20'E, dry deciduous, scrub and riparian forests.

Telangana: Ranga Reddy District: Campus of Sreenidhi International School, 17°46'N & 78°67'E, year 2006–2008, located next to Himayat Sagar Lake and in

those years the area was surrounded by a lot of scrub jungle.

TAXONOMY

Family: Amorphoscelidae Stål, 1877

Subfamily: Amorphoscelinae Stål, 1877

1. *Amorphoscelis annulicornis* Stål, 1871 (Image 1)

Diagnosis (male): small, bark coloured, trunk-dwelling mantis with racket like cerci. Pronotum with paired tubercular projections in front and back. Lateral lobes of vertex tubercle-formed.

Locality: Arunachal Pradesh: West Kameng District, PTR-Langka RF (new record).

Distribution: India: Arunachal Pradesh, Assam, Bihar, Daman & Diu, Himachal Pradesh, Kerala, Maharashtra, Meghalaya, Odisha, Tamil Nadu, West Bengal; Malaysia; Nepal; Sri Lanka.

Family: Hymenopodidae Giglio-Tos, 1915

Subfamily: Parablepharinae Roy, 2008

2. *Parablepharis kuhlii asiatica* Roy, 2008 (Image 2)

Diagnosis: This medium size insect is characterized by the bark colour, bizzare shape of body, by the protuberance on vertex, shape of dentate pronotum, tubercular spines on coxae and the lobed middle leg. The specimen was a nymph and kept the abdomen curved upwards (as also seen in most nymphs of mantis).

Locality: Arunachal Pradesh: West Kameng District, Khellong: Eaglesnest WS (new record). Photo by Ishan Aggarwal.

Distribution: India: Arunachal Pradesh, Assam, Rajasthan, Uttar Pradesh; Laos, Myanmar, Thailand, Vietnam.

Subfamily: Hymenopodinae Giglio-Tos, 1915

Tribe: Hymenopodini Giglio-Tos, 1915

3. *Creobroter apicalis* Saussure, 1869 (Image 3)

Diagnosis: This medium sized colourful insect is identified by its conical eyes with a deep concavity between them, vertex with a spine, eye spot in the middle of fore wings enclosing two black spots. The pronotum is rhomboidal, deeply constricted in front and back.

Locality: Meghalaya: West Garo Hills: Balpakram NP; Tamil Nadu: Kanyakumari WS: Maaramalai (new record), Kanyakumari District; Kalakkad-Mundanthurai TR at Sengaltheri; Andhra Pradesh: Chittoor District: Rishi Valley School campus.



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Image 1. *Amorphoscelis annulicornis* Stål, 1871.



© Ishan Agarwal
Image 2. *Parablepharis kuhlii asiatica* Roy, 2008



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Image 3. *Crebroter apicalis* Saussure, 1869



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Image 5. *Acromantis oligoneura* (De Haan, 1842)



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Image 6. *Ephestiasula amoena* (Bolivar, 1897), nymph



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Image 4. *Acromantis montana* Giglio-Tos, 1915



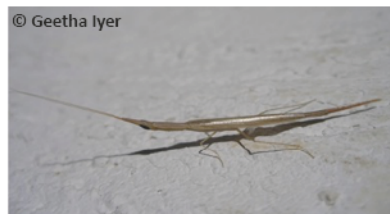
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Image 8. *Humbertiella similis* Giglio-Tos, 1917



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Image 10. *Schizocephala bicornis* (Linnaeus, 1758)



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Image 7. *Ambivia undata* (Fabricius, 1793)



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Image 9. *Didymocorypha lanceolata* (Fabricius, 1798)

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Assam, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Odisha, Sikkim, Tamil Nadu, West Bengal; Bangladesh; Bhutan; China; Java; Nepal.

Subfamily: Acromantinae Brunner de Wattenwyl, 1893
Tribe: Acromantini Brunner de Wattenwyl, 1893

4. *Acromantis montana* Giglio-Tos, 1915 (Image 4)

Diagnosis: This is a medium sized mantis characterized by the spiniform upper middle of frontal sclerite, upper edge of anterior femora sinuated and its internal spines are completely black, pronotum with lateral small tubercles at margins and tips of wing truncated.

Locality: Meghalaya: Garo Hills: Siju WS.

Distribution: India: Andaman Islands, Arunachal Pradesh, Goa, Karnataka, Kerala, Maharashtra, Meghalaya, Tamil Nadu, Tripura; Borneo; Java; Sumatra.

5. *Acromantis oligoneura* (De Haan, 1842) (Image 5)

Diagnosis: This species is similar to the *Acromantis montana* Giglio-Tos, 1915, but differentiated by the blackish internal spines of anterior femora and discoidal area of fore wing being densely reticulated.

Locality: Tamil Nadu: Kanyakumari WS: Maaramalai (new record).

Distribution: India: Assam, Maharashtra, Meghalaya, Tamil Nadu, West Bengal; Bali; Java; Sulawesi; Sumatra; Timor.

6. *Ephestiasula amoena* (Bolivar, 1897) nymph (Image 6)

Diagnosis: This small brown to bark coloured mantis is identified by its oval shape of fore femora which, on the inner upper area, bears a broad black patch; upper margin of vertex concave and frontal sclerite with a deep pit in the middle.

Locality: Tamil Nadu: Kanyakumari District: Suchindram.

Distribution: India: Kerala, Madhya Pradesh, Tamil Nadu, West Bengal.

Tribe: Ambiviini Giglio-Tos, 1919

7. *Ambivia undata* (Fabricius, 1793) (Image 7)

Diagnosis: Insect of medium size, dirty brown body, vertex above ocelli in middle with a sharp horn, tip of vertex grooved, frontal sclerite with obtuse tubercles, pronotum constricted at metazona, fore femora with triangular lobes, middle and hind femora with small pre-apical lobes.

Locality: Arunachal Pradesh: West Kameng District:

Langka RF and Seijosa eco camp (new record); Tamil Nadu: Kanyakumari WS: Kalikesam (new record).

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Sikkim, Tamil Nadu, West Bengal; Borneo; Laos; Malaysia; Myanmar; Nepal; Sri Lanka; Sumatra; Thailand; Vietnam.

Family: Liturgusidae Giglio-Tos, 1915

Subfamily: Liturgusinae Giglio-Tos, 1915

Tribe: Humbertiellini Brunner De Wattenwyl, 1893

8. *Humbertiella similis* Giglio-Tos, 1917 (Image 8)

Diagnosis: This bark inhabitant mantis has pale blackish to dead bark colour body, rounded eyes, lateral lobes of vertex prominent. Pronotum just a little wider in front. In front femora, the longer internal spines are apically black and the veins of costal area of fore wing irregularly disposed.

Locality: Tamil Nadu: Kanyakumari WS: Kalikesam (new record).

Distribution: India: Goa, Himachal Pradesh, Jammu, Kerala, Madhya Pradesh, Odisha, Tamil Nadu, Uttar Pradesh; Nepal; Sri Lanka.

Family: Tarachodidae Handlirsch, 1930

Subfamily: Schizocephalinae Saussure, 1869

9. *Didymocorypha lanceolata* (Fabricius, 1798) (Image 9)

Diagnosis: This slender mantis is identified by its prolonged lateral lobes of vertex not united together and the left one a little longer than right, with oblong eyes and the pronotum a little broader anteriorly. Metazona with five black dots on either side. Legs black dotted; claw groove and femoral brush with black longitudinal lines.

Locality: Telangana: Ranga Reddy District: SNIS (new record).

Distribution: India: Bihar, Goa, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Tamil Nadu, Telangana, Uttar Pradesh, West Bengal; Nepal; Sri Lanka.

10. *Schizocephala bicornis* (Linnaeus, 1758) (Image 10)

Diagnosis: This is very long, slender grass mimicking mantis characterized by a narrow head with anteriorly prolonged conical eyes, triangular metazona, long slender legs, shortened fore coxae; long and triangular supra anal plate .

Locality: Tamil Nadu: Suchindram (new record); Andhra Pradesh: Chittoor District: Rishi Valley school campus.

Distribution: Andhra Pradesh, Bihar, Kerala, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Tamil Nadu,

Uttar Pradesh, West Bengal; Nepal; Sri Lanka; Sunda Island; Thailand.

Subfamily: Iridinae Westwood, 1889

11. *Dysaules longicollis* Stål, 1877 (Image 11)

Diagnosis (male): Colour pale bark. Pronotum quite long, a little slender and ash coloured. Eyes oblong, extend above the summit of head. Vertex between eyes straight. Wings extend up to base of subgenital plate. Cerci cylindrical, long, distal segment elongated and flattened.

Locality: Tamil Nadu: Anaikatti (new record); Maharashtra: Tiwai Hills: Sahyadri school campus.

Distribution: India: Karnataka, Maharashtra, Tamil Nadu, West Bengal.

Subfamily: Caliridinae Giglio-Tos, 1915

12. *Caliris keralensis* (Vyjayandi et al., 2006) (Image 12)

Diagnosis (female): This medium sized green mantis has a short body length compared to the length of pronotum. Eyes rounded, fore femora with long pale white four prominent external spines, fore tibia with six external spines with gaps among them. Both wings shorter than body exposing some of the abdominal segments; costal area of fore wing reticulate and cells are paler green, the distal part of discoidal area with a rust red patch enclosed by yellow. Hind wing pale yellow, with several incomplete rings of 3-4 black patches.

Locality: Tamil Nadu: Kanyakumari WS: Kalikesam (new record).

Distribution: India: Kerala, Tamil Nadu.

Family: Iridopterygidae Giglio-Tos, 1915

Subfamily: Iridopteryginae Giglio-Tos, 1915

13. *Hapalopeza (Hapalopeza) nilgirica* Wood-Mason, 1891 (Image 13)

Diagnosis: This is a small green mantis with a prominent yellow lateral border of yellow on thorax and abdomen. A black line on the lateral edges of pronotum, spots of black on vertex, fore wings blackish and its costal area more blackish particularly near apex where definite black spots are visible in the cells. Pronotum deeply constricted after supra-coxal dialation.

Locality: Tamil Nadu: Kalakkad-Mundathurai TR: Kannikatti.

Distribution: India: Kerala, Maharashtra, Tamil Nadu.

Subfamily: Tropidomantinae Giglio-Tos, 1915

14. *Eomantis guttatipennis* (Stål, 1877) (Image 14)

Diagnosis (female): small green mantis with a little flattened pronotum and distinct carina. Both wings

quite longer than body, the cells of costal and adjacent cells of discoidal portion are opaque.

Locality: Meghalaya: Nokrek NP; Maharashtra: Tiwai Hills: Sahyadri School campus.

Distribution: India: Assam, Bihar, Jharkhand, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Meghalaya, Tamil Nadu, Uttar Pradesh, West Bengal; Myanmar; Nepal; Tibet; Vietnam.

15. *Leptomantella montana* Beier 1941 (Image 15)

Diagnosis: Medium sized slender green mantis with narrow frontal sclerite, both wings extends the length of abdomen, prozona of pronotum with two oblique black lines and fore coxae externally with two black spots.

Locality: Arunachal Pradesh: West Kameng District: Seijosa Sub-division: Seijosa IB (new record).

Distribution: India: Arunachal Pradesh, Assam, Meghalaya, West Bengal.

Family: Mantidae Latreille, 1802

Subfamily: Euchomenellinae Giglio-Tos, 1916

16. *Indomenella indica* (Ghate & Mukherjee, 2004) (Image 16)

Diagnosis (male): Body quite slender while the anterior coxae much shorter than pronotum. The fore wings do not reach the apex of the abdomen. The inner surfaces of anterior femora present two brownish transverse patches near the middle instead of black or blackish band. Middle and hind legs are slender and green and without any paler brownish bands.

Locality: Tamil Nadu: Kanyakumari WS: Samikucchi (new record).

Distribution: India: Tamil Nadu: Anamalai, near Kerala-Tamil Nadu border.

Remarks: The identification of this species became doubtful by the presence of short wings. The present specimen distinctly shows colour variation. The type locality is far from Kanyakumari WS. The upper reaches of Samikucchi shares a border with Kerala. But the specimen was photographed at the lower reaches, which do not share the border of the states of Kerala and Tamil Nadu. Hence we considered this as a new record.

Subfamily: Amelinae Westwood, 1889

17. *Amantis biroi* Giglio-Tos, 1915 (Image 17)

Diagnosis: This is a quite small blackish bark and bush dwelling mantis. The pronotum is elliptical and shorter than fore coxa. Frontal sclerite higher than width.

Locality: Andaman Island: Wandoor (new record); Tamil Nadu: Kanyakumari WS: Balamore estate.



Image 11. *Dysaules longicollis* Stål, 1877



Image 12. *Caliris keralensis* (Vyjayandi, 2006)



Image 13. *Hapalopeza (Hapalopeza) nilgirica* Wood-Mason, 1891



Image 14. *Eomantis guttatipennis* (Stål, 1877)



Image 15. *Leptomantella montana* Beier 1941



Image 16. *Indomenella indica* (Ghate & Mukherjee, 2004)



Image 17. *Amantis biroi* Giglio-Tos, 1915



Image 18. *Gonypeta punctata* (De Haan, 1842)



Image 19. *Tenodera aridifolia* (Stoll, 1813)



Image 20. *Hierodula coarctata* Saussure, 1869



Image 21. *Hierodula nicobarica* Mukherjee, 1995



Image 23. *Mantis religiosa inornata* Werner 1930 (?)



Image 22. *Hierodula doveri* Chopard, 1924

Distribution: Andaman Island, Andhra Pradesh, Maharashtra, Tamil Nadu, West Bengal; Sulawesi; Sunda Island.

18. *Gonypeta punctata* (De Haan, 1842) (Image 18)

Diagnosis: Small brown to pale bark-coloured mantis covered with minute black dots over body. Eyes rounded, short pronotum, fore legs with external blackish bands on coxae and femora. Both wings longer than body, veins of fore wing with black and pale brown alternate marks.

Locality: Telangana: Ranga Reddy District: SNIS (new record); Tamil Nadu: Suchindram.

Distribution: India: Himachal Pradesh, Karnataka, Kerala, Maharashtra, Meghalaya, Tamil Nadu, Telangana, Uttar Pradesh; Borneo; Java; Laos; Malaysia; Myanmar; Sumatra; Thailand.

Subfamily: Tenoderinae Brunner de Wattenwyl, 1893

19. *Tenodera aridifolia* (Stoll) (Image 19) (?)

Diagnosis: Long body. Colour pale green to pale bark. Head wide, vertex convex, eyes round, frontal sclerite transverse. Costal area of fore wing pale yellow-green, discoidal area green. Pronotum long, metazona prismatic, legs long and supra anal plate long, triangular. From photographs, the hind wings appear to be reddish-brown near base.

Locality: Maharashtra: Khed District: Tiwai Hills: Sahyadri School Campus.

Distribution: Cosmopolitan.

Subfamily: Hierodulinae Brunner de Wattenwyl, 1893

20. *Hierodula coarctata* Saussure, 1869 (Image 20)

Diagnosis: Medium sized green mantis with well-built body. Head wide, eyes round, dilation of pronotum pronounced but not reaching middle of metazona; lateral borders pale whitish. Fore coxa with white tubercular spines, discoidal spines black. In fore wing, stigma big, white encased by brown in front and back. The species was redescribed and illustrated earlier by Mukherjee et al. (2010).

Locality: Tamil Nadu: Anaikatti, Suchindram (new record).

Distribution: India: Maharashtra, Tamil Nadu, Telangana, West Bengal; Nepal; Java; Pakistan; Australia?

21. *Hierodula nicobarica* Mukherjee, 1995 (Image 21)

Diagnosis: Big green insect with elongated metazona. The fore coxa with 11 tubercular whitish premarginal spines; all spines of fore femora black at tips. The fore

wings green, longer than end of body and stigma small, oval and pale yellow.

Locality: Andhra Pradesh: Chittoor District: Rishi Valley school campus in 1996 (new record); Tamil Nadu: Coimbatore: foothills of Velliangiri Mountains: Isha Home school campus (New record), Kanyakumari WS: Kalikesam.

Distribution: India: Andhra Pradesh, Nicobar Islands, Tamil Nadu.

22. *Hierodula doveri* Chopard, 1924 (Image 22)

Diagnosis: Body green. Pronotum slender, supra-coxal dilation oval. The metazona at posterior lateral ends with oblique reddish-brown patch. Both wings longer than end of abdomen. The fore coxae with five whitish tubercular spines; longer internal spines of fore femora deep brownish and blackish at tips.

Locality: Telangana: Ranga Reddy District: SNIS (new record).

Distribution: India: Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Tamil Nadu, Telangana.

Subfamily: Mantinae Burmeister, 1838

23. *Mantis religiosa inornata* Werner 1930 (Image 23) (?)

Diagnosis: Medium sized less robust green insect with long and slender pronotum. Head triangular, eyes rounded, metazona of pronotum a little narrow towards the middle. The coxal spot or black patch on femora not visible from photograph. Thus the subspecies of *M. religiosa* cannot be determined on the basis of a single photo. At the same time the other subspecies *Mantis religiosa religiosa* Linné, 1758 has not yet been described from Arunachal Pradesh. So we treat this as *Mantis religiosa inornata*.

Locality: Arunachal Pradesh: East Kameng District: Seijosa sub-division: Pakke-Kessang (new record); Maharashtra: Tiwai Hills; Tamil Nadu: Anaikatti (new record).

Distribution: India: Arunachal Pradesh, Bihar, Madhya Pradesh, Maharashtra, Odisha, Punjab, Tamil Nadu, Uttar Pradesh, West Bengal; Iran; Nepal; Pakistan; Uzbekistan?

24. *Statilia nemoralis* (Saussure, 1870) (Image 24)

Diagnosis: Immature specimen. Blackish-brown slender insect. The prosternum without any black patch, with two whitish spots at basal 1/4th distance. The fore leg externally spotted by black; internally there are two whitish and two black patches (the claw groove being whitish); the longer internal spines, discoidal spine



Image 24. *Statilia nemoralis* (Saussure, 1870)



Image 25. *Statilia maculata* (Thunberg, 1784)



Image 26. *Deiphobe infuscata* (Stoll, 1813)



Image 27a,b. *Phyllothelys* sp.

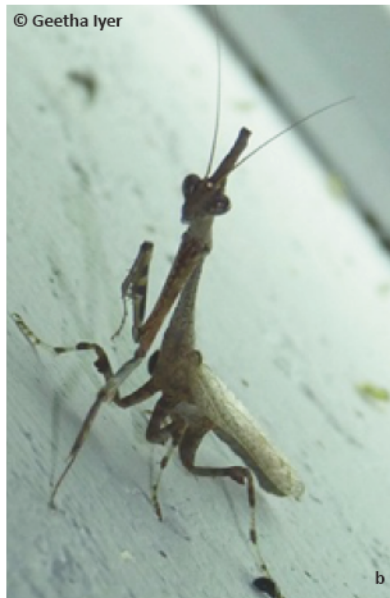


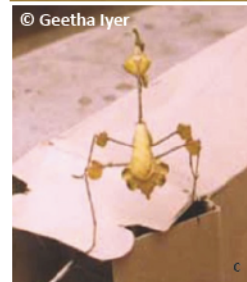
Image 28. *Toxoderopsis taurus* Wood-Mason, 1889



Image 29. *Blepharopsis mendica* (Fabricius, 1775)



Image 30a, b, c. *Gongylus gongylodes* (Linnaeus, 1758)



and inside of external spines are black. Fore coxa with whitish spines and several black spots.

Locality: Tamil Nadu: KMTR: Sengeltheri.

Distribution: India: Arunachal Pradesh, Himachal Pradesh, Maharashtra, Manipur, Kerala, Tamil Nadu, West Bengal; Borneo; China; Japan; Java; Korea; Myanmar; Malaysia; Philippines; Sumatra; Taiwan; Thailand; Vietnam.

25. *Statilia maculata* (Thunberg, 1784) (Image 25)

Diagnosis (male): Body medium size, slender, pale bark coloured. Head triangular with round black eyes. Pronotum elongated with lateral black spots. Fore coxa with minute whitish tubercular spines and internal broad black patch near base; femora with pale yellow patch on claw groove bordered anteriorly by thin black mark. Costal area of fore wing opaque, pale brown, discoidal area transparent, a little blackish.

Locality: Arunachal Pradesh: East Kameng District: Seijosa sub-division: Pakke-Kessang. West Kameng District: Pakke TR: Seijosa IB; Tamil Nadu: Anaikatti (new record).

Distribution: Andaman Island, Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Odisha, Sikkim, Telangana, Uttar Pradesh, West Bengal; Annam; Borneo; China; Japan; Java; Labuan; Laos; Myanmar; Malaysia; Maluku Islands; Nepal; New Guinea; Pakistan; Palawan; Philippines; Sri Lanka; Sumatra; Thailand; Vietnam.

Subfamily: Miomantinae Westwood, 1889

26. *Deiphobe infuscata* (Saussure, 1871) (Image 26)

Diagnosis (male): The fore wings shorter than body; costal area pale yellow, discoidal area brown-grey. Pronotum prismatic, rough; metazona as long as fore coxa. Fore coxa denticulated.

Locality: Maharashtra: Khed dist: Tiwai Hills: Sahyadri school campus.

Distribution: India: Andhra Pradesh, Bihar, Himachal Pradesh, Jammu & Kashmir, Madhya Pradesh, Maharashtra, Tamil Nadu, Uttar Pradesh; Nepal; Sri Lanka.

Subfamily: Phyllotheliinae Brunner de Wattenwyl, 1893

27. *Phyllothelys* sp. (Image 27a,b)

Diagnosis: Body colour pale grey with black spots everywhere. Protuberance of vertex long, dorsally convex and with a small carina at only distal 1/3rd, its lateral edges hardly lobulated at distal portion, apex almost straight except for a median indent. Pronotum slender, covered by black spots; metazona longer than

fore coxa. Fore coxa at anterior edge with 9-10 small spines with black patches at bases. Inside of fore femora with two transverse black patches, smaller one in the middle of distal half and the other is long occupying the dorsal half and extends almost up to the proximal end; its distal portion is widened at claw groove area. The four posterior femora short, with distinct black bands (distinct on tibiae); the distal ventral lobe on middle femur bigger and indented; those on hind femur a little smaller, more triangular and briefly indented; corresponding proximal lobes minute. Both wings as long as end of abdomen, fore wing semitransparent with minute brown spots.

Locality: Tamil Nadu: Anaikatti (new record).

Distribution: India: Madhya Pradesh, Tamil Nadu, Uttar Pradesh; China; Kuatun; Taiwan.

Remarks: The specimen seems to be the female of a new species. Its true identity, however, is impossible to ascertain without proper study through collection of this species. The body colour, pattern of colouration on legs, shape of the ventral lobules of four posterior femora and most importantly, the peculiar shape of the protuberance of vertex (dorsally convex, dorso-median carina visible at distal 1/3rd of length), its lateral edges with indistinct lobes near apical portion, apex almost straight except for a median indent. The truncated apex of the protuberance of vertex in *Phyllothelys parvula* (Xu & Mao, 2004) from China seems similar to this specimen.

Family: Toxoderidae Saussure, 1869

Subfamily: Toxoderinae Saussure, 1869

28. *Toxoderopsis taurus* Wood-Mason, 1889 (Image 28)

Diagnosis (female): Body long, blackish. Eyes with dorso-lateral spines. Pronotum prismatic, at margin finely tuberculated. Middle and hind legs with long genicular spines and the ventral lobe three cristated. Both wings blackish, shorter than body. Cerci lamellar, three crested distally and with fine transverse ridges.

Locality: Telangana: Ranga Reddy District: SNIS.

Distribution: India: Bihar, Jharkhand, Maharashtra, Madhya Pradesh, Odisha, Telangana; Pakistan.

Family: Empusidae Burmeister, 1838

Subfamily: Blepharodinae Giglio-Tos, 1919

Tribe: Blepharodini Beier, 1964

29. *Blepharopsis mendica* (Fabricius, 1775) (Image 29)

Diagnosis (male): Pale whitish-green medium sized insect. Antennae combed. Vertex with protuberance. Eyes round and slightly produced in front. Pronotum with rhomboidal expansion extending behind up to the middle of metazona, borders spinous. In fore wing,

the costal area and major portion of discoidal and anal area pale whitish-green, opaque with green patches; posterior area transparent. Hind wing transparent, colourless.

Locality: Rajasthan: Jaisalmer, Sam dunes on 25 December 2006.

Distribution: India: Rajasthan, Uttar Pradesh; Afghanistan; Algeria; Cyprus; Egypt; Iran; Iraq; Israel; Jordan; Libya; Mauritius; Morocco; Nigeria; Oman; Pakistan; Somalia; Spain; Sudan; Syria; Tunisia; Turkey; Yemen.

Subfamily: Empusinae Burmeister, 1838

30. *Gongylus gongylodes* (Linnaeus, 1758) (Image 30a, b,c)

Diagnosis: Both the male and female are slender, bark coloured. Antennae combed. Vertex with protuberance. Dilation of pronotum restricted to 1/3rd length, lateral angles sharp. Fore coxa with its superior distal angle prolonged, spiniform. Fore femora a little oval dilated at upper edge. The middle and hind femora with distal lobe and its lower portion rounded. Fore wings marked by squarish network by its deep brown veins. An interesting observation concerns the colouration of some individuals. Colour variation between male and female as well as nymphs was noticed in specific instances. The female *G. gongylodes* observed at the Rishi Valley school was pale yellow in colour (these are often pale brown or yellow brown). This has not been noted elsewhere. The nymph observed at the Rishi Valley school campus had a black head, abdominal segments and black colouration in both the raptorial legs and parts of the other two pairs of legs; whereas the nymph at the Sahyadri school campus was pink in colour in all the parts mentioned above. Whether this colour differences were due to

the habitat differences (Eastern and Western Ghats respectively) or an incident of opportunistic camouflage needs to be explored further.

Locality: Andhra Pradesh: Chittoor District: Rishi Valley Campus in 1992, 1996 and 1999 (female, male and nymph, respectively); Maharashtra: Khed District: Tiwai Hills; Tamil Nadu: Suchindram.

Distribution: India: Andhra Pradesh, Kerala, Maharashtra, Odisha, Tamil Nadu, Uttar Pradesh, West Bengal; Java; Malaysia; Myanmar; Nepal; Sri Lanka; Thailand.

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