

A New *Gibbaranea* Archer, 1951 (Araneae: Araneidae) From West Bengal, India with A Note on Biogeography of the Genus

Tapan Kumar Roy*, Sumana Saha** and Dinendra Raychaudhuri*

*Department of Agricultural Biotechnology, IRDM Faculty Centre, Ramakrishna Mission Vivekananda University, Narendrapur, Kolkata – 700103, West Bengal, India. E-mails: tapanroycal1@gmail.com; dinendrarccu@gmail.com

** Department of Zoology, Darjeeling Govt. College, Govt. of West Bengal, Darjeeling, India. E-mail: sahasumana2010@gmail.com

Publication History

Received: 17 August 2015

Accepted: 07 September 2015

Published: 1 November 2015

Citation

Tapan Kumar Roy, Sumana Saha, Dinendra Raychaudhuri. A New *Gibbaranea* Archer, 1951 (Araneae: Araneidae) From West Bengal, India with A Note on Biogeography of the Genus. *Species*, 2015, 16(52), 1-5

ABSTRACT

Gibbaranea indiana sp. nov. recorded from the tea estate of Dooars, West Bengal, India is described and illustrated. Find of the genus from India delimits the distribution range.

Key words: *Gibbaranea indiana* sp. nov., Tea Estate, Dooars, Generic Biogeography.

1. INTRODUCTION

Most araneids are typical orb-weavers and nocturnal. They are frequently seen in the webs during day time. They or their webs are commonly found in plants, gardens, paddy fields, grasslands in marshy habitats, low shrubs and vegetation, tall shrubs in forests, leaf litter near shrubs, curled leaf etc. They play a key role in integrated pest management in any agro ecosystem. This cosmopolitan family is known by 3103 species under 169 genera (World Spider Catalogue, 2015). These include 163 Indian species belonging to 28 genera (Keswani et al., 2012). The genus *Gibbaranea* was established by Archer in 1951 with the type species *Gibbaranea bituberculata* (Walckenaer 1802). Currently, it includes 13 valid species from the world (World Spider Catalogue, 2015). However, there is a doubt on the occurrence of *Gibbaranea bituberculata* (Walckenaer 1802) from India (Tikader and Bal, 1981; Tikader, 1982).

During our sustained survey on spiders from the tea ecosystem of Dooars, West Bengal we came across with a *Gibbaranea* species from Shikarpur T. E.. The species after critical examination is considered as new to science and accordingly described and illustrated.

Tapan Kumar Roy et al.

A New *Gibbaranea* Archer, 1951 (Araneae: Araneidae) From West Bengal, India with A Note on Biogeography of the Genus, *Species*, 2015, 16(52), 1-5,

© The Author(s) 2015. Open Access. This article is licensed under a [Creative Commons Attribution License 4.0 \(CC BY 4.0\)](https://creativecommons.org/licenses/by/4.0/).

2. MATERIAL AND METHODS

Araneids were collected and preserved following Tikader (1987) and Barrion and Litsinger (1995). The material were studied under Stereo Zoom Binocular Microscopes, model Olympus SZX-7. The measurements indicated in the text are in millimeters, made with an eye piece graticule.

2.1. Abbreviations

Abbreviations used: AL= abdominal length, ALE= anterior lateral eye, AME= anterior median eye, AW= abdominal width, CL= cephalothoracic length, CW= cephalothoracic width, PLE= posterior lateral eye, PME= posterior median eye, TL= total length, STE= Shikarpur tea estate, WB= West Bengal.

2.2. Diagnosis

Genus: *Gibbaranea* Archer

Gibbaranea Archer, 1951, *Am. Mus. Novit.*, 1502: 1-34.

Gibbaranea Almquist, 2005, *Ins. Syst. Evol., suppl.*, 62: 1- 284.

Cephalothorax broad, with clypeus height at most twice of anteromedian eye diameter. Medians on light brown elevation, posteromedians largest, encircled with black; laterals small, closely placed; ocular quad trapezoid. Distal **promarginal** tooth in male strongly developed. Femora in female with ventral spines. Abdominal shoulders elevated. Epigynal scape more or less firm, with tip slightly expanded. Median apophysis transverse, somewhat boat shaped, with stout, upcurved terminal spur. **Embolus** with very short **spur** alongside, **conductor** flap irregular.

Type species: *Aranea bituberculata* Walckenaer, 1802.

Distribution: Oriental and Palearctic regions (World Spider Catalogue, 2015).

2.3. Type Material

Holotype: 1♀, STE, 12.IV.2010, Dooars, coll. T. K. Roy

2.4. Type Deposition

Department of Agricultural Biotechnology, IRDM Faculty Centre, Ramakrishna Mission Vivekananda University, Narendrapur, Kolkata – 700103, registration no: RKMVUE 0034-15.

3. DESCRIPTION: Female (Holotype)

CL - 1.43, CW - 1.66, AL - 4.00, AW - 4.69, TL - 5.43. Cephalothorax (Fig. 1) pale brown, elongate oval, clothed with pale brown hairs; cephalic region yellow brown, globose, markedly raised, anteriorly produced, cervical furrows well marked by brown; thoracic region round, somewhat flat, fovea invisible, radii distinct. Eyes (Fig. 2) 8, homogenous, transparent, arranged in 2 rows, anterior strongly recurved, posterior weakly so with posteromedians largest and posterolaterals smallest, ocular quad trapezoid, weakly wider than long, posteriorly narrower, laterals close, eye diameter: PME> AME> ALE> PLE. Interocular distances: AME – AME= 0.27, ALE – AME= 0.24, ALE – ALE= 0.70, PME – PME= 0.18, PLE – PME= 0.28, PLE – PLE= 0.73, ALE – PLE= 0.12, AME – PME= 0.15. Clypeus pale brown, more than anteromedian eye diameter, margins darker, clypeal angles obtuse. Chelicerae (Fig. 3) brown, moderately long, with prominent boss, promargin with 4 and retromargin with 3 teeth; fang dark brown, curved, sharp and stout. Labium (Fig. 4) pale brown, cup shaped, distinctly wider than long, apically pale and scopulate. Maxillae (Fig. 4) pale brown, weakly wider than long, inner margin pale, scopulate. Sternum (Fig. 4) cordate, yellow brown, margins more yellow, lateral margins moderately indented at each coxal base, apical margins strongly concave, tip pointed, not produced, usually clothed with moderately long, pale brown, erect hairs. Legs long, stout, brown, clothed with pale brown, moderate hairs, tarsi with 2 superior, 1 inferior and many accessory claws, superior claws basally 3, pectinate, leg measurements indicated in Table 1. Leg formula 2143.

Abdomen (Fig. 1) sub pentagonal, grey, entirely covered by white folium, this anteriorly at regions reticulate, distinctly wider than long, anteriorly slopped, overhanging the cephalothorax, posteriorly truncate beyond the spinnerets. Dorsum anterolaterally with 2 shoulder humps at the widest region, projected outwardly with distinct chalk white patch on it, a faint, transverse, chalk white line in between them; midlongitudinally with 4 pairs of dark brown, distinct sigillae in transverse rows, posterior pair smallest. Venter brown, anteriorly with silvery white specks, usually clothed with pale brown hairs.

Epigynum – Internal genitalia (Figs. 5 & 6): Epigynal scape thick, broad, v-shaped, spermatheca round, fertilization duct short, projected anteriorly, parallel to each other, copulatory duct long, lateral to atrium, then invaginated and opens into the spermatheca.

Male: Unknown

Distribution: India: West Bengal. The species is so far known from the type locality.

Etymology: The specific epithet is derived from the name of the country.

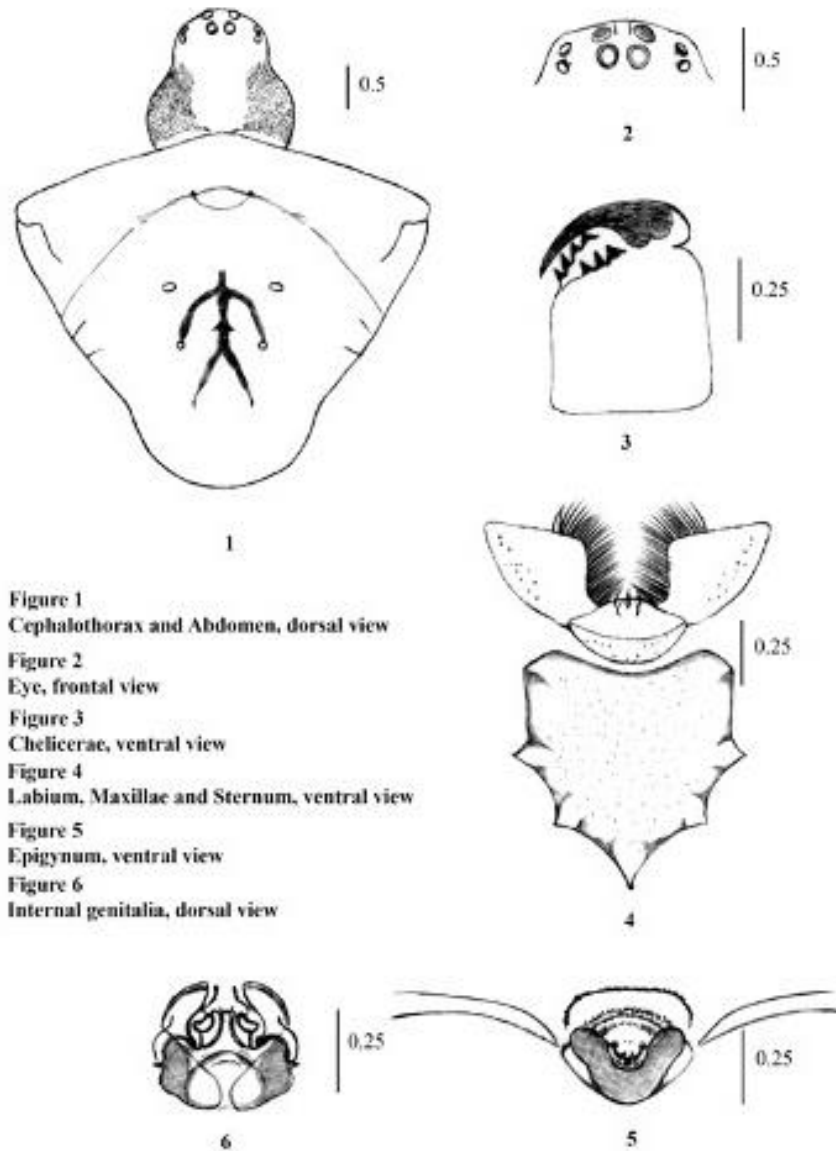
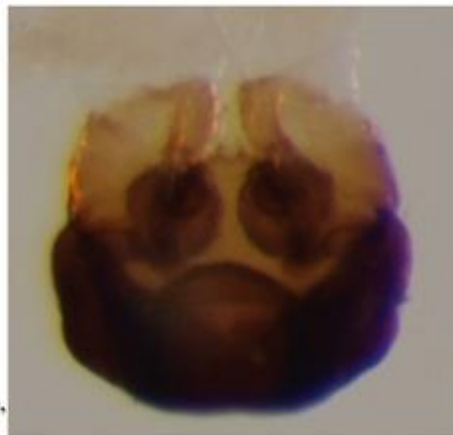


Figure 1
Cephalothorax and Abdomen, dorsal view
Figure 2
Eye, frontal view
Figure 3
Chelicerae, ventral view
Figure 4
Labium, Maxillae and Sternum, ventral view
Figure 5
Epigynum, ventral view
Figure 6
Internal genitalia, dorsal view

Figs.1-6: *Gibbaranea indiana* sp. nov. (Holotype): 1. Dorsal habitus; 2. Eye, enlarged view; 3. Chelicerae, ventral view; 4. Maxillae, labium and sternum, ventral view; 5. Epigynum, ventral view; 6. Internal genitalia, dorsal view.

Table 1: Leg measurements (in mm): Holotype: *Gibbaranea indiana* sp. nov.

Leg segment	Leg I	Leg II	Leg III	Leg IV
Femur	0.82	1.55	1.18	1.73
Patella	0.55	0.55	0.64	0.82
Tibia	2.18	2.00	0.73	1.18
Metatarsi	1.91	1.64	0.91	1.45
Tarsi	0.55	0.55	0.45	0.45
Total	6.01	6.29	3.91	5.63



Figs.7-8: Photographic image: *Gibbaranea indiana* sp. nov. (Holotype): 7. General habitus; 8. Internal genitalia, dorsal view.

4. DISCUSSION

In tea ecosystem, diversity of the family Araneidae is maximum. They are very much common in tea bush, rehabilitation crop, fencing trees, foliage, weeds or sometimes the dry tea leaves, perfectly matching with the back ground. The present species is collected from its web, below the tea bush. The closest ally of the species is *Gibbaranea bituberculata* (Walckenaer 1802) but can be separated by i) abdomen sub pentagonal, grey, entirely covered by white **folium**, distinctly wider than long (abdomen triangular, anteriorly dark brown, posteriorly pale, distinctly longer than wide in *G. bituberculata*); ii) sigillae on abdominal dorsum 4 pairs, dark brown, in transverse rows (sigillae 5-6 pairs in *G. bituberculata*); iii) epigynal **scape** thick, broad, v-shaped (scape small, thin and slender in *G. bituberculata*). Such differences appear to justify the erection of a new species. The species is therefore recognized as new to science.

Tapan Kumar Roy et al.

A New *Gibbaranea* Archer, 1951 (Araneae: Araneidae) From West Bengal, India with A Note on Biogeography of the Genus, Species, 2015, 16(52), 1-5,

© The Author(s) 2015. Open Access. This article is licensed under a [Creative Commons Attribution License 4.0 \(CC BY 4.0\)](https://creativecommons.org/licenses/by/4.0/).

Presently *Gibbaranea* Archer, 1951 includes 13 species: *G. abscissa* (Karsch, 1879) (so far known from Russia, China, Korea, Japan); *G. bifida* Guo, Zhang & Zhu, 2011 (from China); *G. bituberculata* (Walckenaer, 1802) (from Palaearctic region and doubtful occurrence in Himachal Pradesh, India; not included in the distribution of World spider catalogue 2015); *G. bituberculata cuculligera* (Simon, 1909) (so far known from Spain); *G. bituberculata strandiana* (Kolosváry, 1936) (from Eastern Europe); *G. gibbosa* (Walckenaer, 1802) (from Europe to Azerbaijan); *G. gibbosa confinis* (Simon, 1870) (from Spain, Corsica); *G. hetian* (Hu & Wu, 1989) (from China, Mongolia); *G. nanguosa* Yin & Gong, 1996 (from China); *G. occidentalis* Wunderlich, 1989 (from Azores); *G. omoeda* (Thorell, 1870) (from Palaearctic); *G. tenerifensis* Wunderlich, 1992 (from Canary Is.); *G. ullrichi* (Hahn, 1835) (from Europe, Russia, Central Asia) (World Spider Catalogue, 2015). The north-eastern boundary of the genus appears to be Europe to Asia, while Canary Is. and Azores are the north-western and Spain and Corsica are its central or north-central distribution extending upto the northern fringe of Africa. Find of the genus from West Bengal, India delimits its southern boundary.

ACKNOWLEDGEMENTS

We thank National Tea Research Foundation, C/o-Tea Board [17(177)/2008 dt.27.3.2008] for sponsoring the project and the officials of the concerned Tea estate, Dept. of Forest, Govt. of West Bengal, The Head, Dept. of Zoology, University of Calcutta and The Hon'ble Vice-Chancellor, Ramakrishna Mission Vivekananda University, Narendrapur for necessary support. We also thank Prof. Feng Zhang, College of Life Science, Hebei University, Baoding, Hebei, China for providing relevant literature.

REFERENCES

1. Almquist S. Swedish Araneae, part 1: families Atypidae to Hahniidae (Linyphiidae excluded). *Insect Syst and Evol*, 2005, Supplement 62, 1-284
2. Archer AF. Studies in the orbweaving spiders (Argiopidae), 2. *American Museum Nov*, 1951, 1502, 1-34
3. Barrion AT, Litsinger JA. Riceland spiders of south and southeast Asia. CAB International, UK and International Rice Research Institute, Philippines, 1995
4. Keswani S, Hadole P, Rajoria, A. Checklist of spiders (Arachnida: Araneae) from India-2012. *Ind J Arach*, 2012, 1(1), 1 - 129
5. Tikader BK. The fauna of India, Spider: Araneae (Araneidae & Gnaphosidae). *Zool surv India*, Calcutta, 1982, II (1), 1 – 533
6. Tikader BK. Hand book of Indian spiders. Zool Surv India, Calcutta, 1987
7. Tikader BK, Bal A. Studies on some orb-weaving spiders of the genera *Neoscona* Simon and *Araneus* Clerck of the family Araneidae (=Argiopidae) from India. *Rec zool Surv India*, 1981, Occasional Paper No. 24: 1-60
8. Walckenaer CA. Faune parisienne. Insectes. *Ou, Hist des insectes de env de Paris*, Paris 1802, 2, 187-250
9. World Spider Catalog 2015, <http://wsc.nmbe.ch>, version 16, Accessed on 22nd August, 2015