

## Taxonomic studies on a collection of Chalcididae (Hymenoptera, Chalcidoidea) from Chilika Lake, Odisha, India

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**ABSTRACT:** The species diversity of family Chalcididae (Hymenoptera) from the islands of Chilika Lake, Odisha, India was studied. Eighteen species under seven genera of Chalcididae were identified with the addition of new distributional records for eight species from Odisha. Distributional data from India and the host details of all the listed species from Chilika Islands were provided.

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**KEY WORDS:** New distributional records, species diversity, host details

### INTRODUCTION

Chalcididae is one of the most important and fourth largest parasitic hymenopteran family under the superfamily Chalcidoidea (Aguiar *et al.*, 2013), and is the one of the largest in size among the superfamily Chalcidoidea with a body length ranging 1.5 to 15mm. Some Chalcididae species are larval, pupal endoparasitoids of several pest species of Lepidoptera, Diptera and Coleoptera, thus they play significant role in controlling the number of pest in agricultural field by acting as potent bio control agents. They have swollen hind femur rowed with small teeth in the ventral side, oval shaped tegulae, narrow prepectus and simple venation in fore wing without closed cell structure. Most members of the family have black coloured body with white, yellow or red patches on hind femur. The Indian fauna of Chalcididae consists of 225 species under 31 genera (Noyes, 2019). Chilika is the largest brackish water

lagoon in Asia spread over 1,100 km<sup>2</sup> area in the districts of Puri, Khordha and Ganjam of Odisha, India. Chilika Lake was designated as the first “Ramsar Site” of India in the year of 1981 for its rich ecosystem and species diversity. This lake provides shelter to several rare and vulnerable species to sustain their life and it also a home to a large number of migratory birds. Sureshan (2009) reported a total of 45 species of Chalcidoidea under Chalcididae, Eurytomidae, Pteromalidae and Torymidae from Odisha which includes nine species of Chalcididae. Noyes (2019) reported 15 species of Chalcididae from Odisha. Islands in Chilika are lying kilometers apart from one another. Salinity of the water also varies in different localities, so the soil too, that determines the growth of vegetation in the islands. Vegetation is poor to minimum in the islands and insect diversity also varies depends on the availability of vegetation. The present study exclusively carried out from the small islands within

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the lake and land cover outside lake to find out the species diversity of the family Chalcididae.

## MATERIALS AND METHODS

The Chalcididae specimens were collected by net sweeping method from a variety of vegetation of Chilika during the year 2017. The specimens were collected from Balugaon, Grazing Island, Kaliyugeswar, Malati Island and Muggarmukh of Chilika (Fig.19). The collected Chalcididae specimens were mounted on triangular cards as per standard procedure documented by Noyes (1982). Identification of species was done using the dichotomous keys mentioned in Oriental Chalcididae (Narendran, 1989). The specimens were photographed using Leica S8 APO microscope and Leica MC 120HD camera. The voucher specimens are deposited in National Zoological Collections, Zoological Survey of India, Kolkata.

## RESULTS AND DISCUSSION

From the present study, 18 species were collected and identified under seven genera of Chalcididae from Chilika. Eight species were found to be new reports from Odisha. The genus *Brachymeria* was most speciose with ten species. Distributional data provided for all the reported species along with the host association wherever available.

### Systematic account

Class: Insecta; Order: Hymenoptera; Superfamily: Chalcidoidea; Family: Chalcididae

**Genus: *Antrocephalus* Kirby, 1883**

***Antrocephalus phaeospilus* Waterston, 1922 (Fig. 1)**

*Antrocephalus phaeospilus* Waterston, 1922: 22, F. INDIA, Bhim Tal, Kumaon (BMNH)

Distribution: Taiwan (Narendran, 1989), India: Kerala, Uttar Pradesh, West Bengal, Dadra Nagar Haveli (Basak *et al.*, 2020), Andhra Pradesh (Rameshkumar *et al.*, 2022), Odisha (New Record).

Material examined: 1 ♀, INDIA: Odisha, Chilika, Balugaon, 19°44'35", 85°12'42", 19.ii.2017, Coll: Rajmohana, K.

Diagnostic characters: Hind femur red in colour and thick, apex of scutellum bilobed, brownish infuscation adjoining marginal vein, eyes slightly pubescent.

Host: Unknown

**Genus: *Brachymeria* Westwood, 1829**

***Brachymeria apicicornis* (Cameron, 1911) (Fig. 2)**

*Oncochalcis apicicornis* Cameron, 1911: 3, F. (BMNH)

Distribution: Borneo, Java, Sulawesi (Narendran, 1989), India: Bihar, Uttar Pradesh, Odisha, West Bengal (Sheela *et al.*, 2015), Karnataka, Kerala, Tamil Nadu (Noyes, 2019).

Material examined: 1 ♀, INDIA: Odisha, Chilika, Balugaon, 19°44'35", 85°12'42", 19.ii.2017, Coll: Rajmohana, K.

Diagnostic characters: Base of hind tibia and apex yellow remaining middle portion black, pre and post orbital carinae indistinct, not marked well.

Hosts: *Artona catoxantha* (Lepidoptera, Zygaenidae) (Noyes, 2019).

***Brachymeria burksi* Chhotani, 1966 (Fig. 3)**

*Brachymeria burksi* Chhotani, 1966:89, F. INDIA, West Bengal (ZSI)

Distribution: India: Kerala, Uttar Pradesh, West Bengal, Dadra Nagar Haveli, Odisha (Basak *et al.*, 2020). Noted only in India.

Material examined: 1 ♀, INDIA: Odisha, Chilika, Malati Island, 19°38'14.0", 85°10'59.8", 09.ii.2017, Coll: Sheela, S.

Diagnostic characters: Post marginal vein one third of marginal vein, sixth tergite with umbilicate pits, hind femur black with apex, hind tibia base black with sub basal and apical yellow patches.

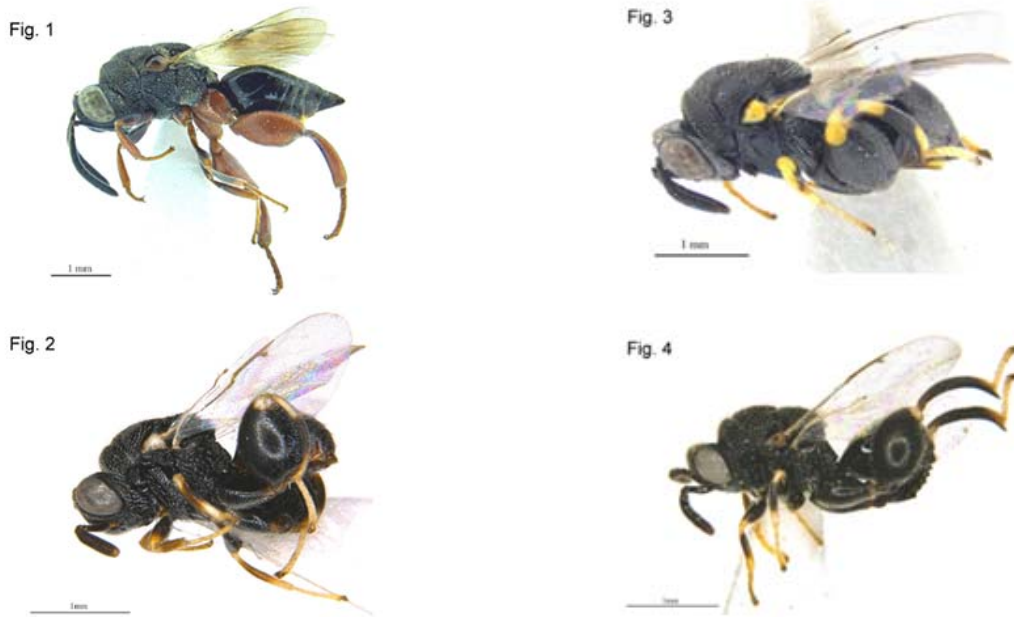


Fig. 1 *Antrocephalus phaeospilus* Waterston, 1922, Lateral view; Fig. 2 *Brachymeria apicicornis* (Cameron, 1911), Lateral view; Fig. 3 *B. Chhotani*, 1966, Lateral view; Fig. 4 *B. carbonaria* (Zehntner, 1906), Lateral view

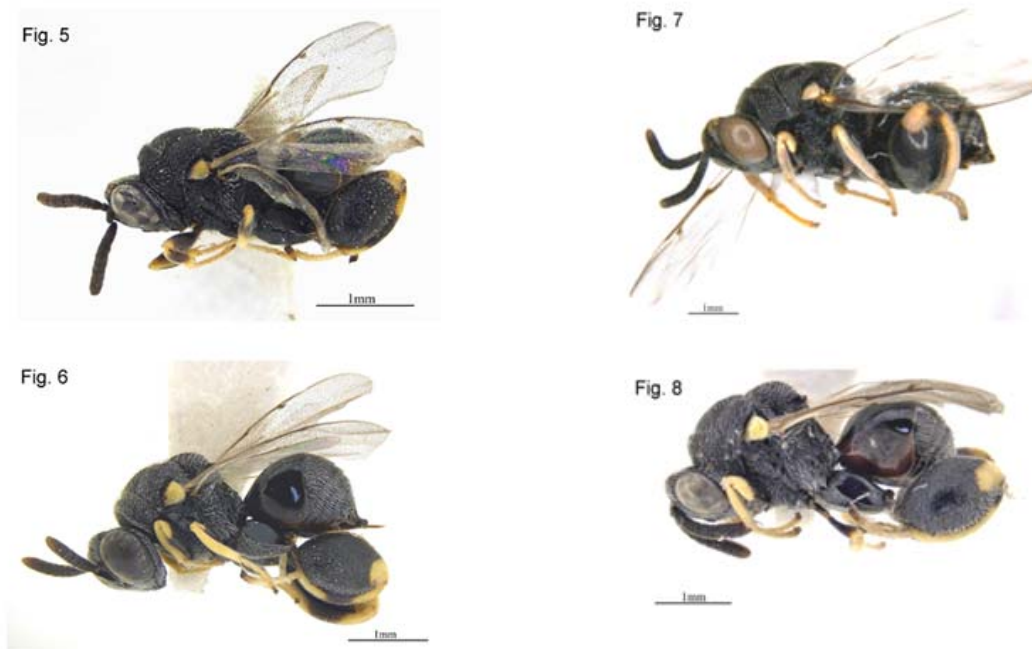


Fig. 5 *Brachymeria excarinata* Gahan, 1925, Lateral view; Fig. 6 *B. hearseyi* (Kirby, 1883), Lateral view; Fig. 7 *B. jambolana* Gahan, 1942, Lateral view; Fig. 8 *B. lasus* (Walker, 1841), Lateral view

Fig. 9



Fig. 11



Fig. 10



Fig. 12



Fig. 9 *Brachymeria minuta* (Linnaeus, 1767), Lateral view; Fig. 10 *Brachymeria podagrica* (Fabricius, 1787), Lateral view; Fig. 11 *Brachymeria taiwana* (Matsumura, 1911), Lateral view; Fig. 12 *Dirhinus anthracia* Walker, 1846, Dorsal view

Fig. 13



Fig. 15



Fig. 14



Fig. 16



Fig. 13 *Dirhinus madagascariensis* (Masi, 1947), Dorsal view; Fig. 14 *Epitranus erythrogaster* Cameron, 1888, Dorsal view; Fig. 15 *Epitranus elongatulus* (Motschulsky, 1863), Lateral view; Fig. 16 *Hockeria lankana* Narendran, 1989, Lateral view



Hosts: *Aspidomorpha miliaris* (Coleoptera: Chrysomelidae) (Noyes, 2019).

***Brachymeria carbonaria* (Zehntner, 1906) (Fig. 4)**

*Chalcis carbonaria* Zehntner, 1906: 164, F.? (BMNH)

Distribution: Java (Narendran, 1989), India: Uttar Pradesh (Sheela *et al.*, 2015), Goa, Mizoram, Tamil Nadu (Gowriprakash *et al.*, 2018), Odisha (New record).

Material examined: 1♀, INDIA: Odisha, Chilka, Grazing Island, 19°42'52.0", 85°24'13.8", 10.ii.2017, Coll: Sheela, S.

Diagnostic characters: First gaster tergite smooth and shiny, hind tibia completely black in colour with apex yellow, hind femur black with a small yellow apical patch, preorbital carina absent.

Host: *Scirpophaga intacta* (Lepidoptera, Pyralidae) (Noyes, 2019).

***Brachymeria excarinata* Gahan, 1925 (Fig. 5)**

*Brachymeria excarinata* Gahan, 1925: 90, F. PHILIPPINES, Luzon (USNM)

Distribution: Cameroon, China, Egypt, Japan, Iran, Papua New Guinea, Peoples' Republic of China, Philippines, Taiwan, Vietnam (Noyes, 2019), India: Odisha, Uttar Pradesh, West Bengal (Sheela *et al.*, 2015), Andaman and Nicobar Islands, Bihar, Gujarat, Karnataka, Kerala, Tamil Nadu (Noyes, 2019).

Material examined: 2♀, INDIA: Odisha, Chilka, Grazing Island, 19°42'52.0", 85°24'13.8", 10.ii.2017, Coll: Sheela, S., 2♀, Malati Island, 19°38'14.0", 85°10'59.8", 09.ii.2017, Coll: Sheela, S., 2♀, Muggarmukh, 19°41'52.3", 85°25'29.4", 10.ii.2017, Coll: Sheela, S.

Diagnostic characters: Pre orbital carina well marked, apex of scutellum not emarginate most or less rounded, metasoma completely black in colour.

Hosts: Different species of Arctiidae, Gelechiidae,

Hesperiidae, Noctuidae, Oecophoridae, Pyralidae, Tortricidae (Lepidoptera), Braconidae (Hymenoptera) and *Calopepla leayana* (Coleoptera: Chrysomelidae) (Noyes, 2019).

***Brachymeria hearseyi* (Kirby, 1883) (Fig. 6)**

*Chalcis hearseyi* Kirby, 1883a: 76, F. INDIA, Barrackpore (BMNH)

Distribution: India: Tamil Nadu (Narendran, 1989), Odisha, Uttar Pradesh (Sheela *et al.*, 2015), Andaman and Nicobar Islands, Bihar, West Bengal (Noyes, 2019).

Material examined: 1♀, INDIA: Odisha, Chilika, Muggarmukh, 19°41'52.3", 85°25'29.4", 10.ii.2017, Coll: Sheela, S; 3♀, Malati Island, 19°38'14.0", 85°10'59.8", 09.ii.2017, Coll: Sheela, S.

Diagnostic characters: Pre orbital carinae absent, apex of scutellum rounded with some pitted median area, tegulae yellow, scrobe reaching front ocellus.

Hosts: Pupa of Nymphalidae (Lepidoptera) (Narendran, 1989), *Hypsipyla robusta* (Lepidoptera, Pyralidae) (Noyes, 2019).

***Brachymeria jambolana* Gahan, 1942 (Fig. 7)**

*Brachymeria jambolana* Gahan, 1942: 41, F. INDIA (USNM)

Distribution: Bangladesh, Indonesia (Noyes, 2019), India: Uttar Pradesh (Sheela *et al.*, 2015), Andhra Pradesh (Rameshkumar *et al.*, 2022), Karnataka, Kerala, Meghalaya, Tamil Nadu (Noyes, 2019), Odisha (New Record).

Material examined: 2♀, INDIA: Odisha, Chilika, Malati Island, 19°38'14.0", 85°10'59.8", 09.ii.2017, Coll: Sheela, S; 3♀, Muggarmukh, 19°41'52.3", 85°25'29.4", 10.ii.2017, Coll: Sheela, S.

Diagnostic characters: Gaster acuminate not at all rounded, ovipositor sheath visible in dorsal view, hind femur black with apical yellow patch, antennal club distinctly shorter than twice the length of preceding segment.

Hosts: *Sarcophaga misera* (Diptera:

Sarcophagidae) and several species of Danaidae, Lymantriidae, Noctuidae, Papilionidae (Lepidoptera) (Noyes, 2019).

***Brachymeria lasus* (Walker, 1841) (Fig. 8)**

*Chalcis lasus* Walker, 1841: 219, Lectotype F. INDIA, Calcutta (BMNH)

Distribution: Australia, Bangladesh, Fiji, Guam, Indonesia, Iran, Japan, Korea, Malaysia, Pakistan, Palau, Peoples' Republic of China, Philippines, Taiwan, Vietnam (Noyes, 2019), India: Andaman and Nicobar Islands, Arunachal Pradesh, Assam, Bihar, Delhi, Gujarat, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Punjab, Tripura, Uttar Pradesh, West Bengal (Noyes, 2019), Odisha (New record).

Material examined: 2♀, INDIA: Odisha, Chilika, Muggarmukh, 19°41'52.3", 85°25'29.4", 10.ii.2017, Coll: Sheela, S; 1♀, Kaliyugeswar, 19°44'59.2", 85°14'31.2", 11.ii.2017, Coll: Sheela, S.

Diagnostic characters: Hind coxa black with a distinct ventromesal tooth, hind femur black with apex yellow, first tergite of gaster smooth and shiny not shagreen, apex of scutellum slightly emarginated, scrobe smooth.

Hosts: Different species of Arctiidae, Bombycidae, Danaidae, Gelechiidae, Geometridae, Hesperidae, Lasiocampidae, Limacodidae, Lycaenidae, Lymantriidae, Lymantriidae, Nymphalidae, Noctuidae, Oecophoridae, Pieridae, Pyralidae, Tortricidae, Zygaenidae (Lepidoptera), Tachinidae (Diptera) and Ichneumonidae (Hymenoptera) (Noyes, 2019).

***Brachymeria minuta* (Linnaeus, 1767) (Fig. 9)**

*Vespa minuta* Linnaeus, 1767: 952, F.? Europe (?UZM)

Distribution: All over World (Narendran, 1989), India: Odisha (Sheela *et al.*, 2015), Andhra Pradesh, Karnataka, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal (Noyes, 2019).

Material examined: 3♀, INDIA: Odisha, Chilika, Malati Island, 19°38'14.0", 85°10'59.8", 09.ii.2017, Coll: Sheela, S.

Diagnostic characters: Hind femur black with yellow apex, sixth tergite shallowly pitted, mesoscutum and scutellum densely pitted in the median portion.

Hosts: Several species of Calliphoridae, Sarcophagidae, Tachinidae (Diptera), Gelechiidae, Hesperidae, Lasiocampidae, Lymantriidae, Pieridae, Tortricidae, Yponomeutidae (Lepidoptera) (Noyes, 2019).

***Brachymeria podagrica* (Fabricius, 1787) (Fig. 10)**

*Chalcis podagrica* Fabricius, 1787: 148, M. INDIA, Tamil Nadu Tranquebar (UZM)

Distribution: All over World (Narendran, 1989), India: West Bengal, Odisha (Sheela *et al.*, 2015), Andaman and Nicobar Islands, Bihar, Madhya Pradesh, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh, Dadra and Nagar Haveli (Basak *et al.*, 2020).

Material examined: 1♀, INDIA: Odisha, Chilika, Kaliyugeswar, 19°44'59.2", 85°14'31.2", 11.ii.2017, Coll: Sheela, S.

Diagnostic characters: Hind femur red with apex white or pale yellow on outer dorsal side not on inner side, hind femur nearly twice as long as wide.

Hosts: Several species of Calliphoridae, Muscidae, Sarcophagidae, Tephritidae (Diptera), Lymantriidae, Noctuidae, Psychidae, Yponomeutidae (Lepidoptera) (Noyes, 2019).

***Brachymeria taiwana* (Matsumura, 1911) (Fig. 11)**

*Chalcis taiwana* Matsumura, 1911: 85, Lectotype F. FORMOSA (EIHU)

Distribution: Indonesia, Taiwan, Vietnam (Noyes, 2019), India: Bihar, Karnataka, Kerala, Tamil Nadu (Noyes, 2019), Odisha (New Record).

Fig. 17



Fig. 18



Fig. 17 *Kriechbaumerella rufimanus* (Walker, 1860), Lateral view; Fig. 18 *Psilochalcis carinigena* (Cameron, 1907), Lateral view

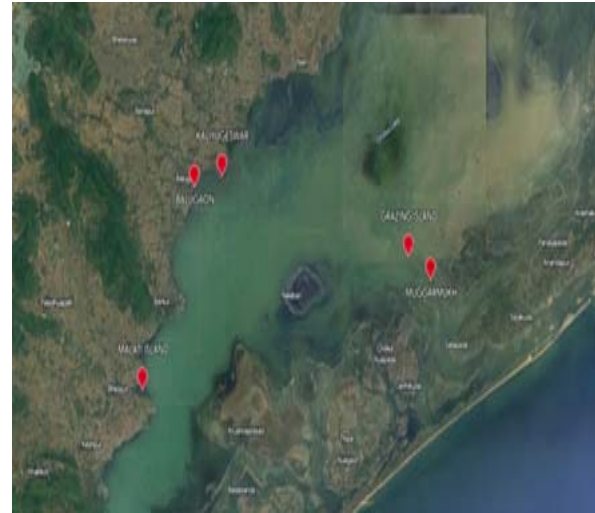


Fig. 19

Fig. 19 Collection localities of Chilika Lake, Odisha

Material examined: 1 ♀, INDIA: Odisha, Chilika, Grazing Island, 19°42'52.0", 85°24'13.8", 10.ii.2017, Coll: Sheela, S.

Diagnostic characters: Upper margin of clypeus completely fused with frons, hind tibia yellow with base and ventral margin black, hind femur completely black, apex of scutellum rounded, first tergite smooth, post orbital carinae distinct.

Host: Unknown

**Genus: *Dirhinus* Dalman, 1818**

***Dirhinus anthracia* Walker, 1846 (Fig. 12)**

*Dirhinus anthracia* Walker, 1846: 7, 85, M. PHILIPPINES, (BMNH)

Distribution: Australia, Philippines, South Africa, Taiwan, Vietnam, Zambia (Noyes, 2019), India: Kerala, Odisha (Sheela *et al.*, 2015); Andaman and

Nicobar Islands, Andhra Pradesh, Bihar, Madhya Pradesh, Manipur, Mizoram, Puducherry, Punjab, Tamil Nadu, Tripura, Uttar Pradesh, Dadra and Nagar Haveli (Basak *et al.*, 2020).

Material examined: 2 ♀, INDIA: Odisha, Chilika, Muggarmukh, 19°41'52.3", 85°25'29.4", 10.ii.2017, Coll: Sheela, S; 1 ♀, Chilika, Balugaon, 19°44'35", 85°12'42", 19.ii.2017, Coll: Rajmohana, K.

Diagnostic characters: Scutellum with a median impunctate strip, each horn in dorsal view broader than scrobal gap, striae on first tergite nearly straight reaching one third of gasteral length, fore and mid legs reddish.

Hosts: Different species of Calliphoridae, Muscidae, Tachinidae, Tephritidae, Sarcophagidae (Diptera), Bombycidae, Noctuidae, Pyralidae, Zygaenidae (Lepidoptera), *Chortoicetes terminifera* (Orthoptera, Acrididae) (Noyes, 2019).

***Dirhinus madagascariensis* (Masi, 1947)  
(Fig. 13)**

*Parenia* *madagascariensis* Masi, 1947: 74, Lectotype F. MADAGASCAR (MNHN)

Distribution: Madagascar (Noyes, 2019), India: Uttar Pradesh (Sheela et al., 2015), Karnataka, Kerala, Tamil Nadu, West Bengal (Noyes, 2019), Odisha (New record).

Material examined: 1 ♀, INDIA: Odisha, Chilika, Grazing Island, 19°42'52.0", 85°24'13.8", 10.ii.2017, Coll: Sheela, S.

Diagnostic characters: Horn with distinct additional tooth, tip of horn hardly jutting out away from eye margin than frontal tooth, first tergite with strong striation extending more than one third length of tergite.

Host: *Sylepta derogata* (Lepidoptera, Pyralidae) (Narendran, 1989).

**Genus: *Epitranus* Walker, 1834**

***Epitranus erythrogaster* Cameron, 1888  
(Fig. 14)**

*Epitranus erythrogaster* Cameron, 1888: 119, Lectotype F. JAPAN, Nagasaki (BMNH)

Distribution: Indonesia, Japan, Laos, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Taiwan, Thailand, Vietnam (Noyes, 2019), India: Odisha (Sureshan, 2009), Andaman and Nicobar Islands, Bihar, Karnataka, Kerala, Maharashtra, Manipur, Puducherry, Tamil Nadu, Uttar Pradesh, West Bengal (Noyes, 2019).

Material examined: 1 ♀, INDIA: Odisha, Chilika, Muggarmukh, 19°41'52.3", 85°25'29.4", 10.ii.2017, Coll: Sheela, S.

Diagnostic characters: Malar area hairy, antenna with clava and flagellar segments usually longer, mesosoma black, forewing hyaline without any brown bands.

Hosts: Some species of family Pyralidae (Lepidoptera) (Noyes, 2019).

***Epitranus elongatulus* (Motschulsky, 1863)  
(Fig. 15)**

*Chalcis elongatula* Motschulsky, 1863: 40, Lectotype F. SRI LANKA, Mt. Patannas (ZMMS)

Distribution: India: Delhi, Kerala, Tamil Nadu (Noyes, 2019), Odisha (New Record), Japan, Sri Lanka (Noyes, 2019).

Material examined: 1 ♀, INDIA: Odisha, Chilika, Muggarmukh, 19°41'52.3", 85°25'29.4", 10.ii.2017, Coll: Sheela, S.

Diagnostic characters: Propodeum without percurrent median portion, incomplete veination, marginal vein completely without colour, seven flagellar segment in female.

Host: Unknown

**Genus: *Hockeria* Walker, 1834**

***Hockeria lankana* Narendran, 1989 (Fig. 16)**

*Hockeria lankana* Narendran, 1989: 91, Holotype F. SRI LANKA (BSRI)

Distribution: Sri Lanka (Narendran, 1989); India: Uttar Pradesh (Sheela et al., 2015), Odisha (New Record).

Material examined: 2 ♂, INDIA: Odisha, Chilika, Grazing Island, 19°42'52.0", 85°24'13.8", 10.ii.2017, Coll: Sheela, S.

Diagnostic characters: Gaster sessile and shorter than thorax, postmarginal vein distinct, marginal vein longer than postmarginal, apex of scutellum bilobed, wings without infuscations in male.

Host: Unknown

**Genus: *Kriechbaumerella* Dalla Torre, 1897**

***Kriechbaumerella rufimanus* (Walker, 1860)  
(Fig. 17)**

*Halticella rufimanus* Walker, 1860: 357, Lectotype M. SRI LANKA (Ceylon) (BMNH)

Distribution: Indonesia, Java, Nepal, Pakistan, Philippines, Sri Lanka (Narendran, 1989), India:



Odisha (Sureshan, 2009), Assam, Bihar, Delhi, Karnataka, Kerala, Tamil Nadu, Uttar Pradesh (Sheela *et al.*, 2015), West Bengal (Rameshkumar *et al.*, 2020).

Material examined: 1 ♀, 2 ♂, INDIA: Odisha, Chilika, Balugaon, 19°44'35", 85°12'42", 19.ii.2017, Coll: Rajmohana, K.

Diagnostic characters: Gaster distinctly shorter than thorax, apex of scutellum bilobed, preorbital carinae present, genotemporal furrow indistinct, gaster smooth and shiny in female, gaster microcultured in male, body colour usually black.

Host: Unknown

**Genus: *Psilochalcis* Kieffer, 1905**

***Psilochalcis carinigena* (Cameron, 1907)  
(Fig. 18)**

*Coelochalcis carinigena* Cameron, 1907b: 579, Lectotype M. INDIA, Gujarat (BMNH)

Distribution: Uttar Pradesh, Odisha (Sheela *et al.*, 2015), Andaman and Nicobar, Bihar, Gujarat, Karnataka, Kerala, Madhya Pradesh, Tripura, West Bengal (Noyes, 2019), Taiwan, Vietnam (Noyes, 2019).

Material examined: 2 ♀, INDIA: Odisha, Chilika, Balugaon, 19°44'35", 85°12'42", 19.ii.2017, Coll: Rajmohana, K.

Diagnostic characters: Lateral part of fore coxa with several well developed rugae, frontogenal carinae complete and distinct, apex of scutellum more or less emerginate, body densely pubescent.

Hosts: *Hyblaea puera* (Lepidoptera, Hyblaeidae) and *Opisina arenosella* (Oecophoridae, Lepidoptera) (Noyes, 2019).

Noyes (2019) reported 15 species of Chalcididae from Odisha but nowhere any species from Chilika Lake were reported. So, this is the first attempt to document the Chalcididae fauna from Islands of Chilika Lake. Altogether 18 species from seven genera of Chalcididae are reported here from Chilika. Out of these 18 chalcididae species, eight

species are the first report from the state of Odisha. The genus *Brachymeria* found most dominating with 10 species. The vegetation is very poor in many islands and minimum in many. Only a very few islands have a good vegetational cover. But it is interesting to find the presence of Chalcididae in the small islands with very little grass cover. Collection of specimens in different seasons may provide a clear picture of the Chalcidid diversity in this place with addition of more species.

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## REFERENCES

- Aguiar A.P., Deans A.R., Engel M.S., Forshage M., Huber J.T., Jennings J.T., Jhonson N.F., Lelej A.S., Longino J.T., Lohrmann V., Mikó I., Ohl M., Rasmussen C., Taeger A. and Yu D.S.K. (2013) Order Hymenoptera. *Zootaxa* 3703(1): 51–62. doi: 10.11646/zootaxa.3703.1.12.
- Basak N., Rameshkumar A., Sheela S. and Kazmi S.I. (2020) On the collection of Chalcididae (Hymenoptera: Chalcidoidea) from Dadra and Nagar Haveli, India. *Records of the Zoological Survey of India* 120(3): 257–262. doi: 10.26515/rzsi/v120/i3/2020/150304.
- Gowriprakash J., Manickavasagam S. and Gupta A. (2018) First report of *Antrocephalus neogalleriae* (Hymenoptera: Chalcididae) from India and other Chalcididae distributional records. *Journal of entomology and zoology studies* 6: 924–926.
- Narendran T.C. (1989) Oriental Chalcididae (Hymenoptera: Chalcidoidea). *Zoological Monograph*. Department of Zoology, University of Calicut, Kerala, India. 440pp.
- Noyes J.S. (1982) Collecting and preserving chalcid wasps (Hymenoptera: Chalcidoidea), *Journal of Natural History* 16(3): 315–334. doi: 10.1080/00222938200770261.
- Noyes J.S. (2019) Universal Chalcidoidea Database. World Wide Web electronic publication. <http://>

- [www.nhm.ac.uk/chalcidoids](http://www.nhm.ac.uk/chalcidoids) (Accessed on 16.08.2023).
- Rameshkumar A., Basak N. and Sheela S. (2020). Family Chalcididae (Hymenoptera: Chalcidoidea). In: Biodiversity Profile of East Kolkata Wetlands (Eds. Chandra, K., Raghunathan, C and Mao, A.A.), Zoological Survey of India, Kolkata. pp170–173.
- Rameshkumar A., Majumder B., Basak N., Dey S., Das P., Sardar S., Kazmi S.I., Mazumdar P.C. and Ahmed I. (2022) Hymenoptera: Apidae, Halictidae, Megachilidae (Apoidea), Chalcididae, Encyrtidae, Eulophidae, Mymaridae (Chalcidoidea), Vespidae, Sphecidae, Formicidae (Vespoidea), Braconidae (Ichneumonoidea). In: Faunal Diversity of Coringa WLS, Conservation Area series, 74: 263 (Eds. Raghunathan C., Balakrishnan S., Mondal T. and Banerjee D.), Zoological Survey of India, Kolkata. pp143–148.
- Sheela S., Kazmi S.I. and Girish Kumar P. (2015) Insecta: Chalcididae (Hymenoptera: Chalcidoidea). In: Fauna of Uttar Pradesh, State Fauna Series 22 (Part-2), Zoological Survey of India, Kolkata. pp597–617.
- Sureshan P.M. (2009) On a collection of Chalcidoidea (Hymenoptera: Insecta) from Orissa, India. Records of the Zoological Survey of India 109(4): 87–104.

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