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ON A COLLECTION OF CHALCIDOIDEA (HYMENOPTERA : INSECTA) FROM ORISSA, INDIA

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INTRODUCTION

The super family Chalcidoidea (popularly called “Chalcids”) forms one of the largest, species rich and taxonomically difficult group of insects belonging to the Order Hymenoptera (Ants, bees and wasps). As per the current estimates, about 22,000 species of Chalcids have been described and catalogued world wide and recent estimates suggest that there may be more than 500000 species in existence (Noyes, 2003). Chalcids are distributed in all zoogeographical regions of the world and majority of them are parasitoids attacking a large range of insect orders in their various stages of development and groups of species in several families are phytophagous, associated with different plant families. Chalcids attack insect hosts in 15 different orders and are also associated with spider egg sacs and some acari and other arachnids. By parasitizing a wide range of insects, chalcids play a vital role in the terrestrial ecosystems in controlling the populations of insect pests. Many species of them have been utilized successfully in biological control programmes all over the world and majority of successful biological control projects of insect pests have used Chalcids to achieve substantial or complete control (Greathead, 1986). The great diversity in their morphology, biological intricacy and specialization combine to make them one of the most marvelously rewarding group of insects to study. Though Chalcids are mainly beneficial, more than 80 species of them are also known to be pests of agriculture. Members of some of the families like Eurytomidae and Torymidae make galls and attack seeds of crop plants.

When compared to the other parts of the world, knowledge on the Chalcid fauna of India and adjacent countries is far from satisfactory. In recent years intensive studies on Indian fauna have been undertaken by Boucek *et al.* (1979), Subba Rao & Hayat, 1985, 1986, Noyes and Hayat, 1994, Hayat, 1998, 2006, Narendran, 1989, 1994, 1999, 2007, Sureshan, 2003 and Sureshan and Narendran, 2003, 2004. The present study is based on a collection of chalcidoidea made from southern coastal districts of Orissa. viz. Ganjam, Puri, Kurdha, Nayargarh, Cuttack, Jagatsinghpur,

Jajpur and Kendrapara during the years 2005 to 2007. The specimens were identified following recent literature on Chalciodidea (Boucek, 1988, Gibson *et al.*, 1993, Narendran 1989 (Chalcididae) Narendran, 1994 (Torymidae and Eurytomidae) Sureshan, 2003, Sureshan & Narendran 2004, Boucek and Rasplus, 1991, Graham, 1969 (Pteromalidae). The classification of Chalcidoidea and terminology given by Boucek (1988) is followed in the present work. A total of 45 species of Chalcidoidea belonging to 28 genera and 4 families are reported from the state of Orissa and almost all of them were recorded for the first time from the state. The collections are deposited in Zoological Survey of India, Estuarine Biological Station, Gopalpur-on-Sea, Orissa.

Following abbreviations are used in the text: F-Female, F1-F6-Funicular segments 1 to 6; M-Male, MV-Marginal vein; OOL-Ocellocular distance; PMV-Post marginal vein ; POL-Postocellar distance; SMV-Submarginal vein; STV-Stigmal vein; T1-T4-Gastral tergites 1 to 4.

SYSTEMATIC ACCOUNT

Family PTEROMALIDAE

Subfamily PTEROMALINAE

1. *Anisopteromalus calandrae* (Howard)

1881. *Pteromalus calandrae* Howard. Ann. Report U.S. Dept. Agr. for., 1880 : 273. M, USA (Texas).

1937. *Neocatolaccus indicus* Ayyar & Mani, Rec. Indian. Mus., 39 : 126: F, India (Coimbatore).

2003. *Anisopteromalus calandrae* (Howard) : Sureshan, Rec. zool. Surv. India. Occ. Paper No., 205 : 16.

Diagnostic characters : Length 2.1-3.1 mm. Head and thorax bluish black, gaster brownish black; head finely reticulate, POL 1.6x OOL; antennae with scape not reaching median ocellus; pronotal collar not carinate, edge sharp; gaster elongate, as long as or longer than head and thorax combined.

Material examined : 1F, Jajpur dist., Krishnadaspur, Mantuka village, 10.iii.07, coll. P.M. Sureshan.

Distribution : India : Kerala, Orissa (present record) Tamil Nadu, West Bengal; Pakistan and Myanmar. Cosmopolitan.

Remarks : Common parasite of beetles (Coleoptera) associated with stored products. Recorded hosts include *Sitophilus oryzae*, *Sitophilus granarius*, *Tribolium castaneum*, and *Callosobruchus* sp.

2. *Callitula peethapada* Narendran & Mohana

2001. *Callitula peethapada* Narendran & Mohana. Uttar Pradesh J. Zool. 21 (1) : 31. F, India (Kerala).

Diagnostic characters : Female : Length 1.4-2.1 mm. Head and thorax metallic green with bronzy reflection dorsally; gaster brown with a broad yellowish spot dorsally at base; head 1.4x as wide as thorax, POL 1.6x OOL; anterior margin of clypeus shallowly emarginate, antennal scape reaching well beyond level of vertex, terminal stylus of club long; pronotal collar anteriorly margined; gaster elongate, ovate, 0.84x as long as head and thorax combined.

Material examined : 1F, Kendrapara dist., Girango village, 12.iii.07, coll. P.M. Sureshan.

Distribution : India : Kerala, Maharashtra, Orissa (present record).

3. *Callitula rugosa* (Waterston)

1915. *Trigonogastra rugosa* Waterston. *Bull. Ent. Res.*, **5** : 326, M, F. Sri Lanka.

1978. *Callitula rugosa* (Waterston) : Boucek et al., *Oriental Ins.*, **12**(4) : 437.

2003. *Callitula rugosa* (Waterston) : Sureshan, *Rec. Zool. Surv. India. Occ. Paper No.*, **205** : 19.

Diagnostic characters : Female : Length 1.5-1.8 mm. Head and thorax dark green, almost black, gaster brownish black, antennae brown except scape yellowish brown; POL 1.5x OOL; anterior margin of clypeus slightly emarginate; Forewing with MV 2x STV; gaster as long as thorax, not collapsing, T1 occupying more than 1/3 length, T2 large, occupying 0.2x length of gaster.

Material examined : 1F, Jajpur dist., Panchapandava, 15.iii.07, coll. P.M. Sureshan.

Distribution : India : Kerala, Orissa (present record); Sri Lanka.

Remarks : Parasitoid of *Ophiomyia phaseoli* (Diptera : Agromyzidae).

4. *Callitula travancorensis* Sureshan

2002. *Callitula travancorensis* Sureshan. *Rec. zool. Surv. India*, **100**(1-2) : 26. F, India (Kerala).

Diagnostic characters : Length 1.1-1.4 mm. Head and thorax black, gaster mostly yellowish brown; clypeus weakly emarginate; POL 1.7x OOL; terminal stylus of antennal club short. Pronotal collar finely but sharply carinate. Forewing with basal cell closed, speculum narrow, almost closed below. Gaster short, petiole wider than long, T1 reaching more than one third length of gaster.

Material examined : 3F, Puri dist., Ashram, 22.i.06; 1F, Jajpur dist., Panchapandava, 15.iii.07, coll. P.M. Sureshan.

Distribution : India : Kerala, Orissa (present record).

5. *Dinarmus acutus* (Thomson)

1878. *Dinarmus* (*Dinarmus*) *acutus* Thomson. *Hym. Scand.* 5 : 56. F, Boheman.

2003. *Dinarmus acutus* (Thomson) : Sureshan, *Rec. zool. Surv. India, Occ. Paper No.*, **205** : 34.

Diagnostic characters : Female : Length 2.1-3.3 mm. Dark metallic blue; anterior margin of clypeus with two small teeth; antennae with third anellus not longer than second, pedicel as long as F1; propodeum with nucha long; forewing with PMV as long as MV; gaster short, non collapsing, 0.7x as long as head plus thorax.

Material examined : 3F, Ganjam dist., Gopalpur, 9.viii.05; 1F, Jajpur dist., Ratnagiri, 17.iii.07; 1F, Udayagiri, 17.iii.07; 1F, Kendrapara, Girango village, 12.iii.07, coll. P.M. Sureshan.

Distribution : India : Kerala, Maharashtra, Orissa (present record); Europe.

Remarks : Common species parasitizing bruchid beetles.

6. *Dinarmus maculatus* (Masi)

1924. *Sphaerakis maculata* Masi. *Ann. Mus. Civ. Stor. Nat. Giacomo Doria*, **51** : 157 Myanmar.
 1979. *Dinarmus maculatus* (Masi) : Boucek, et al., *Oriental Ins.*, **12**(4) : 412
 2003. *Dinarmus maculatus* (Masi) : Sureshan, *Rec. zool. Surv. India, Occ. Paper No.*, **205** : 35.

Diagnostic characters : Female : Length 2.5-3 mm. Metallic blue with bronzy patches on vertex and thorax, gaster darker; anterior margin of clypeus almost straight, not projecting ; POL sub equal to OOL; antennal scape reaching up to middle of median ocellus; third anellus as long as first and second combined; forewing with PMV as long as or slightly longer than MV; gaster cordiform.

Material examined : 2M, Jajpur dist., Sukuapoda, near Lalitagiri, 15.iii.2007, 1F, Udyaygiri, 17.iii.07. 2M, Ponosora village, Panchapandava, 15.ii.07; 1F, Ganjam dist., Ramba, 20.vi.2005, 1F, 2M, Kendrapara dist, Indupur, Dhumata, 13.iii.07, coll. P.M. Sureshan.

Distribution : India : Kerala, West Bengal, Maharashtra, Orissa (present record); Myanmar.

Remarks : Common species, parasitic on Bruchid beetles.

7. *Dinarmus colemani* (Crawford)

1913. *Bruchobius colemani* Crawford. *Proc. U.S. Natn. Mus.*, **45** : 250. F, India (Bangalore).
 2003. *Dinarmus colemani* (Crawford) : Sureshan, *Rec. zool. Surv. India, Occ. Paper No.*, **205** : 35.

Diagnostic characters : Length 2.4 mm. Bluish black with metallic reflection, gaster brownish black; head narrow in profile, anterior margin of clypeus almost straight, slightly projecting ; antennae with third anellus longest, pedicel little shorter than F1; propodeum with nucha long ; forewing with stigma moderately capitate; PMV little shorter than MV; gaster ovate, slightly collapsing, sub equal to head and thorax combined.

Material examined : 1F, Jajpur dist., Panchpandava, 15.iii.07, coll. P.M. Sureshan.

Distribution : India : Kerala, Bihar, Delhi, Karnataka, Tamil Nadu, Orissa (present record); Bangladesh.

Remarks : Uncommon species, parasitoid of *Callosobruchus chinensis* and other bruchid beetles in stored products.

8. *Metastenus indicus* Sureshan & Narendran

2002. *Metastenus indicus* Sureshan & Narendran. *Rec. zool. Surv. India*, **100**(3-4) : 125. F, M, India (Kerala).

Diagnostic characters : Length 1.6-1.8 mm. Black; antennae testaceous; POL little greater than OOL; antennae inserted below centre of face; both mandible with three teeth; anterior margin of pronotal collar not carinate; propodeum with nucha short, finely reticulate, plicae very fine, almost indistinct. Gaster little longer than head plus thorax combined.

Material examined : 1F, Puri dist., Kushabatra, 22.i.2006, 6F, 1M, Kendrapara dist., Indupur, Dhumata, 13.iii.07; 1F, Giango village, 12.iii.07, 2M, Jajpur dist., Ratnagiri, 17.iii.07, coll. P.M. Sureshan.

Distribution : India : Kerala, Orissa (present record).

9. *Norbanus acuminatus* Dutt & Ferriere

1961. *Norbanus acuminatus* Dutt & Ferriere. *Ind. Jr. Agric. Sci.*, **31** : 141. F, India (Barrackpore).

Diagnostic characters : Length 2.5-5 mm. Head and thorax bluish black, gaster brown with greenish coppery tinge. Head engraved reticulate, POL almost as long as OOL, anterior margin of clypeus weakly emarginate, antennae with second anellus twice as long as first, clava almost as long as two preceding segments combined; gaster elongate, ovate, 1.2x as long as head plus thorax combined.

Material examined : 1F, Ganjam dist., Gopalpur, 4.i.2005, coll. P.M. Sureshan.

Distribution : India : Kerala, West Bengal, Orissa (present record).

Remarks : Parasitoid of *Nupserha bicolor* Thoms. (Coleoptera).

10. *Notoglyptus scutellaris* (Dodd & Girault)

1915. *Merismus scutellaris* Dodd & Girault, in Girault. *Mem. Qd. Mus.*, **3** : 328 Queensland.

1988. *Notoglyptus scutellaris* (Dodd & Girault) : Boucek, *Australasian chalcidoidea* : 466.

Diagnostic characters : Length 1.3 mm. Head, thorax and petiole dark green, gaster brown; antennae with scape yellow, remainder brown; clypeus separated from face by obscure sulcus, anterior margin nearly straight, slightly reflexed; prontoal collar finely carinate, scutellum coriaceous with distinct discal fovea; propodeum with nucha not bordered by carina anteriorly; gastral petiole length 1.2x width with weak medina carina, gaster length 1.3x width.

Material examined : 1F, 3M, Kendrapara dist., Manpur, 14.iii.2007, 1F, 1M, Ganjam dist., Gopalpur, 8.x.2005; 1M, Puri dist., Baligaro, 24.xi.2005, 1F, Ganjam dist, Gopalpur, 16.viii.2005, coll. P.M. Sureshan.

Distribution : India : Delhi, Orissa (present record), Kerala, Uttar Pradesh; Italy, Japan, America, Australia.

11. *Oniticellobia longigastra* Sureshan & Narendran

1994. *Oniticellobia longigastra* Sureshan & Narendran. *Rec. zool. Sur. India*, **94(1)** : 113. F, M. India (Kerala).

Diagnostic characters : Length 2.5-5 mm. Body shiny black with greenish gloss; antennae with third anellus as long as first and second combined; POL 1.5x OOL; ocelli moderate, median from lateral by 1.5x of its maximum diameter; gaster long, acuminate, 1.4x as long as head plus thorax combined, epipygium 2.5x as long as broad.

Material examined : 1F, Kendrapara dist., Bhuinpur, 14.iii.07, coll. P.M. Sureshan.

Distribution : India : Kerala, West Bengal, Orissa (Present record).

12. *Oxysyphus nupserhae* (Dutt & Ferriere)

1961. *Neocatolaccus nupserhae* Dutt & Ferriere. *J. Agric. Sci.*, **31** : 139. India (Bharatpur).

2003. *Oxysyphus nupserhae* (Dutt & Ferriere) : Sureshan, Rec. zool. Surv. India. Occ. Paper No. 205 : 67.

Diagnostic characters : Length 3.6 mm. Head and thorax dark blue, almost black, gaster aeneous with coppery shine, head swollen, POL greater than OOL; antennae with third anellus little longer than others, propodeum without median carina; forewing with MV almost half of SMV, STV half of MV, Gaster oval, longer than head plus thorax combined.

Material examined : 2F, 3M, Orissa : Kendrapara dist., Near Dangmal (Rajnagar), banks of river Hansina, 11.iii.2007; 1M, Jajpur dist., Balchandrapur, Rukatipato village, near river Virupa, 16.iii.2007; 1F, Krishandaspur, Mantuka village, 10.iii.07, coll. P.M. Sureshan.

Distribution : India : Kerala, West Bengal, Delhi, Orissa (present record).

Remarks : Parasitic on Cerambycid beetle *Nupserha bicolor* girdling the stem of jute.

13. *Propicroscytus mirificus* (Girault)

1915. *Arthrolysis mirificus* Girault. Mem. Qd. Mus. 4 : 191. Australia (Queensland).

1981. *Propicroscytus indicus* Subba Rao. Proc. Ind. Acad. Sci. (B) 90 : 474-475. India : Punjab. Syn.? by Boucek, 1988 : 410.

Diagnostic characters : Length 2.5-4 mm. Head and mesosoma black or bluish black, gaster pale to dark yellow with sides and middle with brown streaks longitudinally, antennae dark brown with scape, pedicel and anelli testaceous; clypeus slightly emarginate anteriorly; POL almost equal to OOL; pronotum distinctly at lower level, notauli indicated only anteriorly; gaster lanceolate, 1.2x as long as head plus thorax combined.

Material examined : 2F, 5M, Kendrapara dist., Nr Dangmal (Rajnagar), banks of river Hansina, 11.iii.2007, 2M, Manpur, Indupur, 1F, Dhumata, 13.iii.07, 14.iii.07, coll. P.M. Sureshan.

Distribution : India : Andhra Pradesh, Karnataka, Kerala, Maharashtra, Orissa (present record), Uttar Pradesh, South China, East Malaysia, Indonesia, Sri Lanka.

Remarks : Parasitic, sometimes secondarily on gall midges in rice and stems of some other grasses. Commonly occurring in paddy fields and adjacent grassy vegetations.

14. *Propicroscytus oryzae* (Subba Rao)

1973. *Obtusiclava oryzae* Subba Rao. Bull. Ent. Res. 62 : 627. Sri Lanka (Peradeniya).

2003. *Propicroscytus oryzae* (Subba Rao) : Sureshan, Rec. zool. Surv. India, Occ. Paper No., 205 : 78.

Diagnostic characters : Closely resembles *P. mirificus* (Girault) and mainly segregated by the body color. Head and thorax usually metallic green, dorsum usually with distinct green iridescence in certain lights.

Material examined : 2M, Jajpur dist., Ratnagiri, 17.iii.07, 1M, Ponosora village, Panchapandava, 15.ii.07, coll. P.M. Sureshan.

Distributin : India : Kerala, Orissa, Maharashtra, Andhra Pradesh, Arunachal Pradesh; Sri Lanka, China, Indonesia, Thailand.

Remarks : Parasitic on *Orseolia oryzae* (Wood-Mason), paddy gall fly. Commonly occurring in paddy field and adjacent grassy vegetations.

15. *Pteromalus puparum* (Linnaeus)

- 1758. *Ichneumon puparum* Linnaeus. *Syst. Nat. 10th Edt.*, 567, Sweden.
- 1795. *Pteromalus puparum* Linnaeus : Swederus. *Akad. Handl.*, **16** : 203.
- 2003. *Pteromalus puparum* (Linnaeus) : Sureshan, *Rec. zool. Surv. India. Occ. Paper No.*, **205** : 84.

Diagnostic characters : Length 2.4-3 mm. Dark metallic blue, antennae brown, scape testaceous. POL as long as OOL; temple wide, length 0.6x eye length; anterior margin of clypeus shallowly emarginate; antennae with F1 longer than pedicel, funicular segments longer than wide, propodeum with nucha long, gaster ovate, shorter than head and thorax combined.

Material examined : 1F, Jajpur dist., Udayagiri, 17.iii.07, coll. P.M. Sureshan.

Distribution: India : Kerala, Uttar Pradesh, Orissa (present record) Bihar, Assam cosmopolitan.

Remarks : Parasitic in the pupae of various butterflies.

16. *Pteromalus semotus* (Walker)

- 1834. *Eutelus semotus* Walker. *Ent. Mag.*, **2** : 367. F. England.
- 1965. *Habrocytus semotus* (Walker) : Boucek : *Sb. faun. Praci ent. odd. ndr. Mus. Praze*, **11** : 8, 35.
- 1978. *Pteromalus semotus* (Walker) : Boucek & Graham : *Entomologist's Gaz.*, **29** : 225-235.

Diagnostic characters : Length 1.9-2.8 mm. Dark metallic green with golden reflection, antennae testaceous, POL 1.8x OOL; temple 0.4x as long as eye; anterior margin of clypeus weakly emarginate; antennae with pedicel little longer than F1. Forewing with MV short, 1.1 -1.6x STV, gaster 1.1x as long as head plus thorax.

Material examined : 2F, Puri dist., Ashram, 22.i.06; 2F, Kendrapara dist., Nr Dangmal (Rajnagar), banks of river Hansina, 11.iii.2007; 9F, 2M, Indupur, Dhumata, 13.iii.07, 9F, Bhuinpur, 14.iii.07, 4F, Girango village, 12.iii.07, 1F, Jajpur dist., Udayagiri, 17.iii.07, Sukuapoda, nr. Lalitagiri, 15.iii.07, 1F, Jajpur dist, Ratnagiri, 17.iii.07, coll. P.M. Sureshan.

Distribution : India : Kerala, Orissa (present record) cosmopolitan.

Remarks : Primary or secondary parasite in pupae of various Lepidoptera, less often certain beetles (Curculionidae).

17. *Sphegigaster brunneicornis* (Ferriere)

- 1930. *Trigonogastra brunneicornis* Ferriere. *Bull. Ent. Res.*, **21** : 356-357. F. Sri Lanka (Peradeniya).
- 1979. *Sphegigaster brunneicornis* (Ferriere) : Boucek et al., *Oriental Ins.*, **12(4)** : 458.

Diagnostic characters : Female : Length 2-2.5 mm. Body dark green, almost black. Antennal scape, pedicel and anelli yellow, otherwise reddish brown. Antennae with F1 longer than pedicel, narrowed basally, funicular segments longer than wide except F6 sub quadrate; pronotum distinctly carinate; gaster (without petiole) not longer than thorax.

Material examined : 1F, Puri dist, Ashram, 22.i.2006; 2F, Kendrapara dist., Nr Dangmal (Rajnagar), banks of river Hansina, 11.iii.2007; 1F, Kendrapara dist., Manpur, 14.iii.2007, 1F, Indupur, Dhumata, 13.iii.07, coll. P.M. Sureshan.

Distribution : India : Kerala, Maharashtra, Orissa (present record); Sri Lanka.

Remarks : Common species parasitic on pupae of Diptera (Agromyzidae).

18. *Sphegigaster stepicola* Boucek

1965. *Sphegigaster stepicola* Boucek. *Acta. Fauna. Ent. Mus. Natl. Pragae*, **11** : 12-14. M, F. Bohemia.

1971. *Acroclysis melanagromyzae* Mani. *J. Nat. Hist.* **5** : 591-593. Syn. Boucek et al., 1979. *Oriental Ins.*, **12(4)** : 458.

Diagnostic characters : Length 1.5-2 mm. Body shiny black, slender; antennae with all funicular segments transverse, F1 shorter than pedicel; gaster oval, shorter than mesosoma, petiole length nearly 3 x width, hind margin of T1 with middle portion truncate or virtually so.

Material examined : 1F, Kendrapara dist., Balchandrapur, Rukatipato village, nr.river virupa, 16.iii.2007; 1M, Jajpur dist., Udayagiri, 17.iii.07, 1F, Panchpandava, 15.iii.07, coll. P.M. Sureshan.

Distribution : India : Kerala, Delhi, Bihar, Uttar Pradesh, Orissa (present record); Austria, Chezchoslovakia, USSR, Algeria.

Remarks : Parasitic on *Melanagromyza soyae* (Soya bean fly), *Melanagromyza* sp. and *Phytomyza* sp. (Agromyzidae : Diptera) mining the leaves of *Helianthus* and *Vigna catjang*.

19. *Toxeumorpha minuta* Sureshan & Narendran

2000. *Toxeumorpha minuta* Sureshan & Narendran. *J. Bombay. nat. Hist. Soc.*, **97(3)** : 406. M, F. India (Kerala).

Diagnostic characters : Length 1.2 mm. Black. Antennae brown with scape paler; POL 1.4x OOL; antennae inserted along the lower margin of eyes, scape not reaching median ocellus, pedicel longer than F1, third anellus as long as first and second combined; propodeum with plicae complete, callus with black bristles similar as on other areas of thorax; forewing with basal vein setate; gaster with T1 and T2 covering most of the length.

Material examined : 1F, Puri dist., Kushabadra, 22.i.2006, coll. P.M. Sureshan.

Distribution : India : Kerala, Orissa (present record).

20. *Trichomalopsis apanteloctena* (Crawford)

1911. *Trichomalopsis apanteloctenus* Crawford. *Proc.U.S. natn. Mus.*, **39** : 618 M, F. Japan : Konosu.

1919. *Eupteromalus parnarae* Gahan. *Proc.U.S. natn. Mus.*, **56** : 522. F, India (Karvetnagar). Syn. Kamijo & Grissell, 1982 : *Kontyu, Tokyo*, **50(1)** : 77.

2003. *Trichomalopsis apanteloctena* (Crawford) : Sureshan, 2003. *Rec. zool. Surv. India.*, Occ. Paper No., **205** : 97.

Diagnostic characters : Length 1.6-2.5 mm. Lower margin of clypeus rather deeply incised medially, striae on clypeus extending to lower margin of eyes and to malar sulcus; both mandibles

with four teeth; occipital carina sharp, in posterior-dorsal view strongly curved medially. Antennae with combined length of pedicel plus flagellum length 0.8-0.93x head width in female and 0.95-1.05x in male. Gaster 1.7-2x as long as broad.

Material examined : 9F, Puri dist., Baligaro, 24.xi.2005, 26.xi.2005; 6F, Ashram, 22.i.06; 3F, Ganjam dist., Gopalpur, 16.viii.2005, 1F, Jagatsinghpur dist., Kujango, Tonda island, 28.xi.2005; 1F, Cuttack dist., Bidarnasi, 26.xi.2005, coll. P.M. Sureshan.

Distribution : India : Kerala, Tamil Nadu, Karnataka, Orissa (present record); Bangladesh, Korea, Malaysia, China, Japan, Taiwan, Philippines, Vietnam.

Remarks : Parasitic on *Cnaphalocrocis medinalis* (Lepidoptera : Pyralidae) and *Pelopidas mathias* (Lepidoptera : Hesperiidae) Commonly occurring in paddy field and adjacent grassy vegetations.

21. *Trichomalopsis nigra* Sureshan & Narendran

2001. *Trichomalopsis nigra* Sureshan & Narendran. *Journal Bombay Nat. Hist. Soc.*, **98**(3) : 400. M, F. India (Kerala).

Diagnostic characters : Length : 1.5-2 mm. head and thorax black with little metallic reflection. Pronotal collar weakly but sharply margined except at sides; antennae with scape as long as eye, pedicel plus flagellum 0.84x head width; gaster with T1 reaching almost half length of it; temple narrow, length 0.4x eye length.

Material examined : 1F, Orissa : Ganjam dist., Ramba, 20.vi.2005, coll. P.M. Sureshan.

Distribution : India : Kerala, Orissa (present record).

Remarks : Associated with paddy field and grasses.

22. *Trichomalopsis ovigaster* Sureshan & Narendran

2001. *Trichomalopsis ovigaster* Sureshan & Narendran. *Journal Bombay Nat. Hist. Soc.*, **98**(3) : 402. M, F. India (Kerala).

Diagnostic characters : Length 1.8-2.4 mm. Dark brownish green with metallic reflection; temples rounded; pronotal collar regularly margined even on sides; forewing with PMV as long as MV; median area of propodeum broad, 1.3x as broad as long, plicae not very sharp. Gaster oval, ovipositor sheaths strongly protruding.

Material examined : 3F, Orissa : Jagatsinghpur dist., Kujang, Tonda island, 28.xi.2005, 5F, Puri dist., Ashram, 22.1.2006, coll. P.M. Sureshan.

Distribution : India : Kerala, Orissa (present record).

23. *Trichomalopsis thekkadiensis* Sureshan & Narendran

2001. *Trichomalopsis thekkadiensis* Sureshan & Narendran. *Journal Bombay Nat. Hist. Soc.*, **98**(3) : 398. M, F. India (Kerala).

Diagnostic characters : Length 1.6-2.7 mm. Bluish green with metallic reflection. Temple strongly converging behind eyes; prontoal collar irregularly margined; propodeum with plicae

very sharp, reaching up to tip of nucha, nucha more constricted, median carina strong; T1 of gaster reaching only one third length.

Material examined : 1F, Puri dist., Ashram, 22.i.06, coll. P.M. Sureshan.

Distribution : India : Kerala, Orissa (present record).

Subfamily SPALANGINAE

24. *Spalangia nigroaenea* Curtis

1839. *Spalangia nigroaenea* Curtis : *Brit. Ent.*, **16** : fol. 740. P(2). Britain.

2008. *Spalangia nigroaenea* Curtis : Sureshan, *Fauna Lon. Crat. Sanc. Cons. Area. Series*, **37** : 171.

Diagnostic characters : Female : Length : 2.9-3.8 mm. Black, often with brassy lusture; head distinctly longer than broad (in male only as long as broad), umbilically punctate with interspaces about as wide as punctures; pronotum with an isolated crenulate cross-line consisting of close punctures in front of hind margin, disc of collar more or less smooth, impunctate, collar bordered anteriorly by a narrow groove, setting off ridge like margin; gaster petiole expanded anteriorly.

Material examined : 3M, 3F, Ganjam dist., Gopalpur, 26.viii.2005, 2F, Kendrapara dist., Indupur, Dhumata, 13.iii.07, coll. P.M. Sureshan.

Distribution : India : Delhi, Karnataka, Maharashtra; Pondicherry; cosmopolitan.

Remarks : Parasitoid of fly puparia, especially of the synanthropic species.

25. *Spalangia simplex* Perkins

1910. *Spalangia simplex* Perkins. *Fauna Hawaiiens*, **2** : 657. Hawaii : Honolulu.

1998. *Spalangia simplex* Perkins : Ahmad, *Shashpa*, **5** : 12.

Diagnostic characters : Black. Pronotal collar anteriorly rounded. Mesoprescutum with a distinct cross-line (similar to those on pronotum and scutellum) and a round fovea behind it on disc.

Material examined : 3F, 1M, Puri dist., Ashram, 22.i.2006; 2M, Cuttack dist., Matta Moto, 25.xi.2005, coll. P.M. Sureshan.

Distribution : India (Uttar Pradesh, Tamil Nadu, Orissa (present record); East Africa, Malaysia.

Subfamily DIPARINAE

26. *Netomocera nigra* Sureshan & Narendran

1990. *Netomocera nigra* Sureshan and Narendran. *Oriental Ins.*, **24** : 223. India (Kerala).

Diagnostic characters : Length 1.73-2.36 mm. Black, gaster ventrally brown. POL 3.5x OOL; antennal toruli at the level of anterior margin of eyes, funicular segments of equal length; club broad, as long as four preceding segments combined; forewing with MV 2x as long as PMV and 3x STV; gaster (without petiole) short, oval, 1.7x as long as its maximum width; petiole longitudinally rugose, as long as broad, T1 exceeding well beyond middle of gaster.

Material examined : 1F, 2M, Kurdha dist., Barbara forest, Rajin R.F., Andhori nalla, 13.x.06; 1F, Kurdha dist., Barbara forest. Batpada chowk, 11.x.2006. coll. P.M. Sureshan.

Distribution : India : Kerala, Orissa (present record).

Subfamily HERBERTIINAE

27. *Herbertia indica* Howard

1959. *Herbertia indica* Burks, Proc. Ent. Soc. Wash., **61**(6) : 252. Sri Lanka.

1986. *Herbertia indica* Burks : Farooqi & Subba Rao. Oriental Ins., **20** : 289.

Diagnostic characters : Female : Length 1.1-1.5 mm. Black, metallic violaceous reflection on face and gaster dorsally; legs whitish except coxae, trochanter and femora bluish black; head and thorax granulate reticulate; antennae inserted on lower face, scape not reaching middle of face, extending 0.75x eye height, F1 shorter than pedicel, club as long as three preceding segments combined; forewing with MV slightly greater than 2x as long as PMV; gaster broad and short, T1 covering most of the gaster.

Material examined : 1F, Puri dist., Ashram, 22.i.06, coll. P.M. Sureshan.

Distribution : India : Madhya Pradesh, Bihar, Kerala, Karnataka, Maharashtra, Orissa (present record); Sri Lanka.

Remarks : Uncommon species parasitic on leaf mining dipterous larvae.

Subfamily PANSTENONINAE

28. *Panstenon oxylus* (Walker)

1834. ? . *Pteromalus assimilis* Nees. Hym. Ichn. aff. Mono. illust., **2** : 116-117. (Type lost). Syn. by Thomson. 1878. Hym. Scand. Ptero., 176-177.

1839. *Miscogaster oxylus* Walker. Mon. Chalciditum, **1** : 196. Lectotype , UK, Designated, Graham, 1969 : 94.

1846. *Panstenon oxylus* (Walker) Syn. Walker, List. Hym. coll. Birt. Mus., **I** : 29.

Diagnostic characters : Length 1.6-2.4 mm. Metallic green, head brownish with slight violaceous tinge, finely reticulate, anterior margin of clypeus truncate; eyes large; malar space about two fifths the length of an eye; pronotal collar weakly margined or not margined, notauli tending to be less slightly impressed; frenal line of scutellum fine and weak; gaster usually sunken dorsally, petiole without hairs, 2x as long as broad.

Material examined : 4F, Cuttack district, Bidarnasi, 26.xi.2005; 1F, Jagatsinghpur dist., Kujango, Tonda island (Chilka lagoon), 28.xi.2005; 1F, Paradip, 26.xi.2005; 2F, Puri dist., Ashram, 22.i.06, coll. P.M. Sureshan.

Distribution : India : Orissa (Present record), China, Finland, Japan, Korea, Sweden, United Kingdom.

Subfamily ORMOCERINAE

Tribe SYSTASINI

29. *Systasis dalbergiae* Mani

1942. *Systasis dalbergiae* Mani. Indian J. Ent., **4** : 157-158. India (Dehradun).

Diagnostic characters : Length 1.5-1.8 mm. Body bright metallic green, antennae dark brown; OOL 1.25x ocellar diameter, face rugously punctate between scape and inner orbital border, just below antennae transversely reticulate; both mandibles tridentate; antennae with pedicel much longer than F1, all funicular segments sub equal.

Material examined : 1F, Kendrapara dist., Indupur, Dhumata, 13.iii.07, coll. P.M. Sureshan.

Distribution : India : Karnataka, Orissa (present record).

30. *Systasis dasyneurae* Ahamed & Mani

1939. *Systasis dasyneurae* Mani. in Ahmad & Mani, 1939 : 535-537. India (Haryana).

Diagnostic characters : Length 1.75-2.0 mm. Bright metallic green. Antennae with pedicel slightly longer than first funicular segment, funicular segments sub equal; left mandible tridentate, right with an additional tooth between second and third; propodeum very short, almost hidden by scutellum medially; forewing hyaline, about twice as long as broad, MV nearly twice STV, PMV nearly one and one fourth to twice STV.

Material examined : 1F, Jajpur dist., Panchapandava, 15.iii.07, coll. P.M. Sureshan.

Distribution : India : Uttar Pradesh, Madhya Pradesh, Orissa (present record).

Family CHALCIDIDAE

Subfamily CHALCIDINAE

31. *Brachymeria bengalensis* (Cameron)

1897. *Chalcis bengalensis* Cameron : Mem. Manchester Soc., **XLI** (4) : 39. India (Barrackpore).

1989. *Brachymeria bengalensis* (Cameron) : Narendran, Oriental Chalcididae : 261.

Diagnostic characters : Hind femur red (often with black patch of varying size on outer disc) with a yellow spot or patch at apex. Apex of scutellum distinctly and well emarginate with dense silvery pubescence.

Material examined : 1F, Ganjam dist., Gopalpur, 15.x.2005, coll. P.M. Sureshan.

Distribution : India : Assam, Delhi, Rajasthan, Uttar Pradesh, West Bengal, Orissa (present record); all over Oriental region and Japan.

Remarks : A common *Brachymeria* species parasitic on *Earias vietlla* (= fabia) Fabricius. (Lepidoptera : Noctuidae).

32. *Brachymeria euploiae* (Westwood)

1837. *Chalcis euploiae* Westwood. Trans. ent. Soc. London, **2**, VI. 6. India.

1989. *Brachymeria euploiae* (Westwood) : Narendran, Oriental Chalcididae : 251.

Diagnostic characters : Apex of scutellum rounded or entire or at the most very weakly or slightly emarginate; hind femur always black with apex yellow. Antennal club more than twice preceding segment; gaster globose or subglobose.

Material examined : 1F, Orissa, Jajpur dist., Ratnagiri, 17.i.2007, coll. P.M. Sureshan.

Distribution : India : W. Bengal, Uttaranchal, Tamil Nadu, Kerala, Karnataka, Orissa (present record); North Borneo, Sumatra, Java, and Philippines.

Remarks : Common *Brachymeria* species parasitizing various Lepidoptera.

33. *Brachymeria minuta* (Linnaeus)

1767. *Vespa minuta* Linnaeus. *Systema naturae*, 12(1) : 952. Europe.

1989. *Brachymeria minuta* (Linnaeus) : Narendran, *Oriental Chalcididae*, : 259.

Diagnostic characters : Hind femur not more than one and four fifth times as long as wide with a distinct tooth at inner basal side, dorsal margin not angulate, usually black with apex yellow.

Material examined : 1F, Jajpur dist., Ratnagiri, 17.iii.07, coll. P.M. Sureshan.

Distribution : India : Karnataka, Sikkim, Tamil Nadu, Uttar Pradesh, W. Bengal, Orissa (present record); cosmopolitan.

Remarks : Common. Parasitoid of various Diptera, sometimes secondarily.

34. *Kriechbaumerella rufimanus* (Walker)

1860. *Halticella rufimanus* Walker : *Ann. Mag. nat. Hist.*, 6 : 357. Lectotype M, Sri Lanka.

1989. *Kriechbaumerella rufimanus* (Walker) : Narendran, *Oriental Chalcididae* : 71.

Diagnostic characters : Pre-orbital carina distinct, post orbital carinae indistinct, genotemporal furrow absent; apex of scutellum bilobed; gaster shorter than thorax, first tergite smooth and shiny in female, in male microsculptured or shagreened. Hind femur black, liver brown or testaceous.

Material examined : 1F, Jajpur dist., Ratnagiri, 17.iii.07, coll. P.M. Sureshan.

Distribution : India : Kerala, Uttar Pradesh, Rajasthan, Tamil Nadu, Karnataka, Assam, Orissa (present record); Nepal, Sri Lanka, Indonesia, Pakistan, Java, Philippines.

Subfamily DIRHININAE

35. *Dirhinus anthracia* Walker

1846. *Dirhinus anthracia* Walker : *List. Hym. Coll. Brit. Mus.*, 7, 85. M, Philippines.

1989. *Dirhinus anthracia* Walker : Narendran, *Oriental Chalcididae* : 294.

Diagnostic characters : Head below apex of each horn without distinct additional tooth, anterior and dorsal (inner) edge of horn converging in acute to right angle, anterior and lateral edges forming acute angle of about 60°; antennae fore and mid legs testaceous or rufous; antennae of female thick; scutellum anteriorly with a median impunctate strip; striae on first gastral tergite reaching only one-third length.

Material examined : 1F, Jajpur dist., Ponosora village, 15.iii.07; 1F, Kendrapara dist., Potamundi, 11.iii.07, 1M, Ganjam dist., Gopalpur, 26.08.05, coll. P.M. Sureshan.

Distribution : India : Madhya Pradesh, Manipur, Punjab, Tripura, Uttar Pradesh, Orissa (present record); Oriental region. Africa, Australian and Mediterranean region.

Remarks : Common species parasitic on various Diptera and Lepidoptera.

36. *Dirhinus bakeri* (Crawford)

1914. *Pareniaca bakeri* Crawford. Proc. U.S. natn. Mus., **45** : 459. F, Philippines, Manila.
 1989. *Dirhinus bakeri* Crawford : Narendran, Oriental Chalcididae : 297.

Diagnostic characters : Forewing pubescence reduced especially with no hairline recurrent from stigmal or if a hair line partly developed, then petiole at least slightly transverse, in female area of four carinae on petiole 1.5-2 x as broad as long, dense striae on first tergite forming broad area with convex hind margin and taking up more than quarter of tergite length.

Material examined : 1M, Nayargarh dist., Kusapola village, 14.x.2006, 3F, Ganjam dist., Gopalpur, 26.viii.2005, coll. P.M. Sureshan.

Distribution : India : Kerala, Orissa (present record), Uttar Pradesh, Karnataka, T. Nadu, Sikkim); Sri Lanka, Malaysia, Philippines and Japan.

Remarks : Common parasite of various Diptera and Lepidoptera.

Subfamily EPITRANINAE

37. *Epitranus albipennis* Walker

1874. *Epitranus albipennis* Walker in Smith 1874. Trans, ent. Soc. London, 400. F, Japan : Hyogo.
 1989. *Epitranus albipennis* Walker : Narendran, Oriental Chalcididae : 315.

Diagnostic characters : Body mainly red brown, eyes large, in dorsal view maximum diameter about two-third the breadth of vertex; POL clearly more than twice OOL; hind femur behind basal tooth with comb of at least 20 narrow regular teeth.

Material examined : 2F, Jajpur dist., Ratnagiri, 17.iii.07, coll. P.M. Sureshan.

Distribution : India : Uttar Pradesh, Kerala, Orissa (present record), W. Bengal, Andhra Pradesh); Malaysia, Indonesia, S. China, Taiwan, Philippines, Borneo and Japan.

Remarks : Parasitoid of Pyralid moth.

38. *Epitranus erythrogaster* Cameron

1888. *Epitranus erythrogaster* Cameron : Manchester phil. Soc., **26** : 119. Lectotype F, Japan (Nagasaki).
 1989. *Epitranus erythrogaster* Cameron : Narendran, Oriental Chalcididae : 323.

Diagnostic characters : Malar space hairy, frons with fine structure, scrobal part mainly reticulate to finely cross striate, clypeal roof more pilose, more extensively concave, antennae long and slender, thorax black.

Material examined : 2F, Jajpur dist., Panchapandava, 15.iii.07, coll. P.M. Sureshan.

Distribution : India : Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttar Pradesh, West Bengal, Orissa (present record); All over Oriental region, S, Japan.

Remarks : Most common species. Parasitic on Pyralid moths.

39. *Epitranus observator* Walker

1862. *Epitranus observator* Walker. Trans. ent. Soc. Lond., (3)**1** : 349-350. F. Uganda.

1989. *Epitranus observator* Walker : Narendran, *Oriental Chalcididae* : 314.

Diagnostic characters : Head red, thorax black, pubescence on thorax longer and denser; pronoal collar carina broadly interrupted, head stout with almost round temples.

Material examined : 1F, Ganjam dist., Gopalpur, 20.viii.05, coll. P.M. Sureshan.

Distribution : India : Bengal, Orissa (present record), Africa, Sri Lanka, Thailand and Malaysia.

Family TORYMIDAE

Subfamily TORYMINAE

40. *Podagrion charybdis* Fernando

1957. *Podagrion charybdis* Fernando. *Ceylon j. Sci.*, **25** : 217, F, M. Sri Lanka (Syntypes lost?).

1994. *Podagrion charybdis* Fernando : Narendran, *Zool. Monograph*, **68**, 79.

2009. *Podagrion charybdis* Fernando; Sureshan, *Jr. Threat. Taxa*, **1**(4) : 234-235.

Diagnostic characters : Length 3.1-3.3 mm. Head and thorax metallic greenish blue; antennae testaceous, club brown, almost equal to preceding five segments combined; propodeum with an inverted V shaped carina, base of V not reaching base, join with irregular longitudinal rugae at the base; hind femora with 6 teeth, second tooth small, forewing with speculum and basal cell closed below, gaster including petiole slightly longer than thorax and 0.81x as long as head plus thorax, ovipositor 2.63x as long as gaster and 1.2x length of body.

Material examined : 44F, 12M, Kendrapara dist., Dhumata village, Idupur, ex. Ootheca of mantid *Tenodera fasciata* (Olivier), coll. P.M. Sureshan, 13.iii.2007.

Distribution : India : (Orissa) Sri Lanka.

Remarks : Reported for the first time from India after the original description from Sri Lanka (Sureshan, 2009).

41. *Odopoia reticulata* Sureshan

2007. *Odopoia reticulata* Sureshan. *Zoos' print journal*, **22**(8) : 2787-2789, F, India (Orissa).

Diagnostic characters : Length 2.35 mm. Black with bright metallic greenish blue reflection on face and thorax; pronotum distinctly raised reticulate, mesoscutum, scutellum (except for a central oval shiny spot posteriorly) moderately reticulate; Forewing with a narrow cross band at stigmal area. Propodeum smooth, median area raised, with distinct median carina and several irregular longitudinal carinulae on either side, gaster with hind margin of T1 and T2 distinctly incised in the middle.

Material examined : 2F, Orissa : Puri dist., Baligaro, 24.xi.2005, coll. P.M. Sureshan.

Distribution : India (Orissa).

42. *Torymoides anamalaianus* (Mani & Kurian)

1972. *Holaspis anamalaianus* Mani & Kaul : *Oriental Ins.*, **6**(3) : 313. M, F. Inida (Devikulam).

1994. *Torymoides anamalaianus* (Mani & Kaul) : Narendran, 1994 : 44, 47.

Diagnostic characters : Female length : 2 mm scape, thorax, gaster, coxae, femora metallic green, length of ovipositor equal to thorax, POL 2x OOL, first four funicular segments of antenna width and length sub equal; ovipositor equal to length of gaster.

Material examined : 6F, 2M, Orissa, Kurdha dist., Tangi R.F., Kiapalla-Dhani south, 15.x.06, 2F, 3M, Nayargarh dist., Tangi R.F., Kusapola village, 14.x.06, coll. P.M. Sureshan.

Distribution : India : Uttar Pradesh, Kerala, Tamil Nadu, Orissa (present record).

Remarks : Sureshan (2007) reported the species first time from Orissa.

43. *Palmon orchesticus* (Masi)

1926. *Pachytomoides orchesticus* Masi, Konowia, 5 : 1-20, 264-279. Taiwan.

1957. *Podagrion iago* Fernando, Ceylon J. Science (Biol. Sci.) 1 : 7-18. (Narendran, 1994. syn.).

1995. *Palmon orchesticus* (Masi) : Grissell, 1995. Mem. Ent. Int., 2 : 158-160.

Diagnostic characters : Length 3.1 mm. Head and thorax metallic green with thorax darker, hind coxa yellow with blackish patch on dorsal side of basal half. Antennal club length exceeding preceding 5 or 6 segments but not exceeding 7 segments; hind femur with 8-9 teeth (7 teeth reported) 4 large primary teeth and 4 or 5 smaller secondary teeth, forewing with MV not longer than 3x PMV, Ovipositor 3 to 5x longer than the body.

Material examined : 1F, Orissa : Kurda dist., Rajin R.F., Andhori nalla, 13.x.06, coll. P.M. Sureshan.

Distribution : India : Kerala, Andhra Pradesh, Orissa; Sri Lanka, Taiwan.

Remarks : Sureshan (2007) reported the species first time from Orissa.

Family EURYTOMIDAE

Subfamily EURYTOMINAE

44. *Acantheurytoma spinifera* Cameron

1911. *Acantheurytoma spinifera* Cameron, Societas ent., 26 : 23. Borneo.

1981. *Odonteurytoma tanjorensis* Mukerjee : 25 : 45, Syn. by Narendran, 1994 : 202.

Diagnostic characters : Length : 4.3 mm. Black, fore and mid femora, fore and mid tibiae, all trochanters reddish brown; maximum diameter of eye 2-3x malar space in profile; anterior width of head 1.62x distance between front ocellus and clypeal margin; frons concave, preorbital carinae profoundly raised, running up to vertex, vaguely joining each other behind front ocellus, front ocellus situated inside scrobe. Gastral petiole shorter than half length of hind coxa, with a tooth on either side on dorsal region.

Material examined : 1F, Kendrapara dist., Indupur, Dhumata, 13.iii.07, coll. P.M. Sureshan.

Distribution : India : Kerala, Orissa (present record), Tamil Nadu, East Malaysia (N. Borneo).

Remarks : Parasitic on sphecid wasp larva.

Subfamily RILEYINAE

45. *Burassium naso* Boucek

1983. *Buresium naso* Boucek. *Ent. Scand.*, **14** : 187. F, India (Delhi).

Diagnostic characters : Length 3-4.2 mm. Body reddish brown with antennae distally, gaster dorsally beyond middle of T4, all femora and tibiae darkened or infuscate. Forewing with two conspicuous infuscations one at parastigma and another attached to PMV and STV; inter antennal projection forming round headed tooth projecting abruptly between upper margins of antennal sockets, gaster with T4 with a deep transverse depression just behind base.

Material examined : 1F, Ganjam dist, Gopalpur, 16.viii.05, coll. P.M. Sureshan.

Distribution : India : Delhi, Orissa (present record), Pakistan and Thailand.

Remarks : Only known from Delhi (Type locality) and Orissa in India.

SUMMARY

The present paper deals with the report of 45 species of Chalcidoidea (Hymenoptera) belonging to 28 genera under 4 families (Pteromalidae, Eurytomidae, Chalcididae and Torymidae) from Orissa. The study is based on specimens collected from the coastal districts of South Orissa during the year 2005-07.

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