



Description of four new species of *Dipara* Walker (Hymenoptera: Pteromalidae) from India, with records of some species and a key to the Oriental species

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ABSTRACT: Four new species of *Dipara* Walker, 1833 (Hymenoptera: Pteromalidae) are described and material pertaining to six known species is recorded. The new species described are: *Dipara andamanensis* Sureshan & Raseena, sp. n., *D. angulata* Sureshan & Nikhil, sp. n., *D. kannurensis* Sureshan & Raseena, sp. n., and *D. yercaudensis* Sureshan, sp. n. Of the six species recorded, *D. gastra* (Sureshan & Narendran) is newly recorded from India. A revised key to the Oriental species of *Dipara* is also given.

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KEYWORDS: Hymenoptera, Pteromalidae, *Dipara*, new species, new records, India.

INTRODUCTION

The genus *Dipara* Walker (1833) belongs to the subfamily Diparinae of Pteromalidae (Hymenoptera: Chalcidoidea) and currently contains 48 described species worldwide, with 17 species known from the Oriental Region (Sureshan, 2013; Noyes, 2014). Sureshan (2013) published the first revision of the Oriental species of *Dipara* with records of 17 species from the region, including six new species described from India. Subsequent to this revision, more specimens of *Dipara* were collected from different parts of India. The present work includes the description of four new species and a new Indian record of *D. gastra* (Sureshan & Narendran). Key to the Oriental species of *Dipara* given by Sureshan (2013) is revised to accommodate the new species.

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MATERIAL AND METHODS

The specimens were collected from different parts of the country employing different collection gadgets like Sweep Net, Malaise Trap and Yellow Pan Trap, in different cases. The specimens were card mounted and studied under a stereoscopic binocular microscope (Leica M 205C) and photographs were taken with a digital camera (MC170 HD), and also illustrations were made with a Camera Lucida attached to the microscope.

The terminology used in this paper generally follows Gibson (1997). The type specimens are deposited in the National Zoological collections of Zoological Survey of India, Western Ghat Regional Centre, Calicut (ZSIK).

The following abbreviations are used in the text:

F1–F7 = Funicular segments 1 to 7; MV = Marginal vein; OOL = Ocellocular distance; PMV = Postmarginal vein; POL = Postocellar distance; SMV = Submarginal vein; STV = Stigmal vein; T1–T5 = Gastral tergites 1–5.

RESULTS AND DISCUSSION

Dipara Walker

Dipara Walker 1833:371,373. Type species *D. petiolata* Walker by monotypy. (For synonyms refer to Desjardins (2007) and Sureshan, 2013).

Key to the Oriental species of *Dipara* Walker (females) (Excluding species from Oriental China) (Modified from Sureshan, 2013).

1. Wings reduced (Brachypterous).....2
- Wings fully developed (Macropterous).....**10**
2. Median area of propodeum with uniform longitudinal rugae, arranged in a sub-circular form; frenum represented by a very narrow area with small rugae (Figs.10, 13); mesoscutum (almost completely) black with a characteristic ‘W’ shaped area yellowish brown*D. yercaudensis* Sureshan sp.n.
- Propodeum without uniform longitudinal rugae as above, partly, irregularly carinated or with irregular areolae ; scutellum always with frenum broader than above; mesoscutum not coloured as above , sometimes body completely brownish black**3**

3. Mesoscutum with notauli not meeting in the posterior end.....**4**
 – Mesoscutum with notauli meeting in the posterior end.....**8**
4. Mesoscutum blackish brown in distal two-thirds; carina of pronotal collar characteristically angulate and slightly broken in the middle (Fig.14); forewing stump long and narrow reaching beyond the tip of petiole***D. angulata* Sureshan sp.n.**
 – Mesoscutum without blackish brown colour as above, sometimes body uniformly brownish black, then forewing stump long and broad, reaching beyond tip of petiole, otherwise forewing stump very short and not reaching petiole**5**
5. Forewing stump 4.3× as long as broad, reaching beyond tip of petiole; petiole stout, finely reticulate, 1.6× as long as broad; propodeum with characteristic median carina, plicae and costulae (Fig.19).....***D. venkati* Sureshan**
 – Forewing stump very short and narrow not reaching or just touching base of petiole; petiole slender, longitudinally carinate, more than 1.6× as long as broad; propodeum with or without median carina, plicae and costulae not as above.....**6**
6. Propodeum with baso-medial area between plicae conically elevated up to middle, surface not shiny, with longitudinal and transverse carinae and striae; wing stump extending well beyond the hind margin of scutellum, touching base of petiole and with 5 or 6 bristles**7**
 – Propodeum (Fig.18) with baso-medial area between plicae not conically elevated up to the middle, surface almost shiny with very weak striations; wing stump short, not reaching much beyond hind margin of scutellum and with only 2 setae.....
***D. intermedia* Sureshan & Narendran**
7. Body length, 2.6 mm; upper face and vertex distinctly reticulate; POL equal to OOL; antenna with F6 and F7 whitish yellow as on clava; F2–F5 dark brown; wing stump with 5 bristles; hind coxae reticulate.....***D. eukeralensis* Ozdikmen**
 – Body length, 1.5 mm; upper face and vertex almost shiny, only weakly reticulate, POL slightly shorter than OOL; only F7 whitish yellow as on clava; F3–F6 brown; wing stump with 6 bristles; hind coxae striate reticulate
***D. mohanae* Narendran & Sureshan**
8. Mesoscutum with distinct black patch covering almost posterior two-thirds; pronotum with a distinct transverse carina; forewing stump with one short and one long bristle***D. thirumalaii* Sureshan**

- Mesoscutum with black patch on posterior half of scapulae only; pronotum with or without transverse carina; forewing stump with 3 or 4 setae.....**9**
- 9. Propodeum without a median carina; antenna with F6 partly whitish yellow as on clava; forewing stump with 4 setae; gaster swollen with T3-T6 not very short, and yellowish brown with a distinct yellow band overlapping T1 and T2. Size 1.8–1.9 mm.....***D. gastra* (Sureshan & Narendran)**
- Propodeum with a weak median carina in posterior third, plicae not united; antenna with F6 completely brown; forewing stump with 3 setae; gaster narrow and compressed with T3–T6 short, and almost brown with epipygium and ventral part paler. Size 1.45–1.6 mm.....***D. malabarensis* (Narendran & Mini)**
- 10. Pronotal collar with separate long and stout bristles near posterior margin in addition to short pubescence**14**
- Pronotal collar without separate long and stout bristles near posterior margin in addition to short pubescence.....**11**
- 11. Mesoscutum posteriorly with a black or bluish black patch in lower half of scapulae; petiole long 2–2.6 × as long as broad in dorsal view.....**12**
- Mesoscutum posteriorly without black or bluish black patch in lower half of scapulae as above, sometimes black patch covering all the three lobes in posterior third; petiole short, 1.63 × as long as broad in dorsal view..... **13**
- 12. Scapulae with the bluish black patch distinct and covering almost half length in the lower half; notauli closely converging posteriorly; petiole 2 × as long as broad in dorsal view; pronotal collar carinated anteriorly.....***D. debanensis* Sureshan**
- Scapulae with the black patch small, and not sharp as above and covering only posterior third; petiole 2.6×as long as broad in dorsal view (Figs.2,20); pronotal collar not carinated anteriorly..... ***D. andamanensis* Sureshan & Raseena, sp.n.**
- 13. Mesoscutum without any black patch or band, bristles little above centre; reticulation of body fine; antenna with F4–F6 brown (F4 partly)... ***D. miniae* Narendran & Sureshan**
- Mesoscutum with a broad black patch covering all the three lobes in posterior third, bristles in the centre; reticulation of body coarse; antenna with F4–F7 brown.....
.....***D. nigriscuta* Sureshan**
- 14. Scrobe long , separated from front ocellus by a distance as long as the diameter of front ocellus, exceeding well over middle length of eye from toruli..... **15**

- Scrobe shorter than above, at the most reaching mid-level of eyes from toruli.....**18**
- 15. Petiole smooth and shiny without longitudinal carina, short, with maximum posterior width 1.13× dorsal length; frenal area of scutellum shorter than scutellar area in front; body large, length 4.5mm.....***D. sringericus* (Narendran)**
- Petiole with distinct longitudinal carina or reticulation, long, with maximum posterior width 0.7–0.9× dorsal length; frenal area almost as long as scutellar area in front; body small, length 2.1–2.7mm.....**16**
- 16. Petiole long, 1.7× as long as broad in dorsal view, almost half length of hind coxa, dorsally mostly reticulate and with carinae only in hind part (Fig.17); face without metallic blue reflection. (Size 2.7mm)..... ***D. nigra* Sureshan**
- Petiole short, 1.2–1.4× as long as broad in dorsal view, without reticulation, only longitudinally carinate, carinae sometimes weak medially; face with distinct metallic blue reflection.....**17**
- 17. Petiole short, 1.2× as long as broad in dorsal view, and with a pair of setae very close to anterior margin; pronotal collar with a row of four strong setae near posterior margin; bristles on the mid lobe of mesoscutum little below middle; fore wing almost hyaline***D. hayati* Sureshan**
- Petiole long, 1.4× as long as broad in dorsal view, and with a pair of setae almost in the middle (Fig.16); pronotal collar with a row of four strong setae near posterior margin; bristles on the mid lobe of mesoscutum little above middle; fore wing smoky.....***D. kannurensis* Sureshan & Raseena, sp.n.**
- 18. Forewing with three infumate patches; petiole a little longer than half length of hind coxa; axillae and pronotum pink; head mostly brownish pink with vertex and occiput darker***D. bouceki* (Narendran)**
- Forewing without infumations, hyaline; petiole one-third as long as hind coxa; axillae, pronotum and head black.....***D. keralensis* (Narendran)**

Species descriptions

1. *Dipara andamanensis* Sureshan & Raseena, sp. n. (Figs. 1-3 & 20)

urn:lsid:zoobank.org:act:828B4512-5A5E-4B5B-B93D-D31E8A564309

Holotype: ♀: Length 1.75mm. Body yellowish brown, face with two transverse brown bands, one below the lower margin of eye, second at the level of toruli; eyes and ocelli silvery, eyes with a large central black patch, ocellar area brownish black. Antennae testaceous except F5,

F6, F7 and basal part of clava brown. Mesoscutum with black spot on lower part of scapulae, propodeum more brownish laterally. Forewing with three transverse brown bands, one below parastigma, one at the basal part of MV and the other below STV covering major distal part of wing; bristles of body and wings brownish black. Fore and hind coxae and basal half of hind femora white, remainder of legs testaceous. Gaster honey brown, epipygium yellow.

Head: (Figs. 1,3) Moderately reticulate with small sparse white pubescence, in front view 1.14× as wide as long, malar grooves fine but distinct; eyes 1.33× as long as broad (in profile); scrobe deep reaching half-length of eyes, inter-antennal and parascrobal areas slightly raised; toruli separated by 1.5× their individual diameter; malar space almost 0.59× eye length (in profile). Head 2.08× as broad as long in dorsal view, POL almost as long as OOL, vertex broad with three pairs of bristles partly black. Antennae inserted below middle of face and above level of lower margin of eyes, scape as long as eye with a strong bristle on the tip, pedicel plus flagellum 1.58× width of head, all funicular segments with single row of long sensillae, pedicel 2× as long as broad, F1–F3 almost equal, F4–F7 slightly shorter and almost equal, clava as long as three preceding segments combined.

Mesosoma: (Fig.2) Pronotal collar moderately reticulate, not carinate anteriorly, pubescence white and sparse, visible in posterior margin only. Mesoscutum 1.46× as broad as long, moderately reticulate, a pair of black bristles on middle of mid lobe and another black bristle on either side on posterior corner of scapulae; notauli not converging towards posterior end. Scutellum medially 0.84× as long as mesoscutum, with two pairs of setae, first pair in anterior part and second pair on the frenal line, area in front of frenum raised reticulate as on mesoscutum, frenal area 0.87× as long as rest of area, shiny on the middle, longitudinally carinate laterally. Dorsellum shiny. Propodeum (Fig.20) medially 0.75 as long as scutellum, without median carina, broad median triangular smooth area reaches almost up to base of nucha, remaining areas of medial part irregularly carinate, plicae complete; spiracles small, round, separated from posterior margin metanotum by 2× of its diameter. Prepectus smooth and broad. Mesopleuron shiny except mesepisternum with broad areolae; metanotum shiny. Forewing 3.42× as long as broad, SMV with five long bristles (including two on parastigma), MV with two rows of bristles, marginal fringe long, speculum small, closed below, basal hairline with a tuft of strong setae below parastigmal vein, brown bands of wing represented by strong dark setae. Relative lengths, SMV 4.3, MV 4, PMV 1.5, ST 0.6

Metasoma: Petiole (Fig.20) 2.61× as long as wide in dorsal view, longitudinally carinate with a pair of white setae laterally in the basal 1/3 length, 0.21× as long as rest of gaster; T1 largest, T2–T4 almost of same length, posterior margin of tergites straight, gaster 2.78× as long as broad in dorsal view (without petiole).

Material examined: Holotype, female, INDIA: Andaman and Nicobar Islands, Little Andaman, Harminder Bay, 30.i.2013, Coll. P.M.Sureshan (ZSIK, Reg. No. ZSI/WGRC/IR/INV/4079).

Etymology: The species derives its name from the type locality.

Remarks: *Dipara andamanensis* resembles *D. debanensis* Sureshan (2013) in general morphology but differs from it in having antennae not very slender, mesoscutum with the black patch on side lobes small and not very distinct, notauli not much converging posteriorly, pronotal collar not carinate anteriorly, gastral petiole not reticulate and with a pair of white setae anteriorly, forewing with discal pubescence distinct in the form of setae on brown patches, and marginal fringe long (in *debanensis*, antennae very slender, black patch of side lobes of mesoscutum broad and distinct, notauli very closely converging towards posterior end, pronotal collar margined in the middle, gastral petiole striate reticulate with two pairs of white setae anteriorly and forewing with discal pubescence less distinct, and marginal fringe small.)

2. *Dipara angulata* Sureshan & Nikhil, sp. n. (Figs. 4-6 & 14,15)

urn:lsid:zoobank.org:act:AA07E753-AAD9-4404-8FB9-049D898734BE

Holotype: ♀: Length 3.24 mm (with ovipositor), 2.87mm (without ovipositor). Body honey brown, ocellar area black. Antennae with scape, anelli, basal part of F1 testaceous, pedicel except tip and F2-F6 brownish black, F7 and clava yellowish white. Forewing stumps pale brown with a dark brown spot at tip. Fore and hind coxae white, middle coxae brown, remainder of legs testaceous. Gaster blackish brown, ovipositor and epipygium testaceous;

Head: (Fig.4,6) Mostly engraved reticulate, shiny on upper face, hind part of vertex and occipital area closely reticulate, pubescence present on lower face. In front view head width $16\times$ height, clypeus smooth, anterior margin sub truncate, clypeal and inter-antennal area raised; scrobe deep, reaching little above middle of eyes, with transverse reticulation; malar groove less distinct, malar space $0.71\times$ eye length, eye $0.84\times$ as long as broad in profile. In dorsal view head width $2.1\times$ length, POL $0.88\times$ OOL. Antennae inserted along lower margin of eyes, toruli separated by individual diameter; scape with a strong bristle at tip, length equal to eye length and $2.4\times$ as long as pedicel, pedicel plus flagellum $1.42\times$ width of head, anelli strongly transverse, pedicel $2.8\times$ as long as broad and $1.5\times$ F1, funicular segments longer than broad, with one row of long sensillae, clava as long as 3 preceding segments combined.

Mesosoma: (Fig.5) Pronotal neck finely reticulate, collar narrow, shiny, anteriorly carinate, carina angularly produced in the centre and slightly broken, collar dorsally $1.84\times$ as broad as long. Mesoscutum moderately reticulate except anterior and median portions shiny, almost completely brownish black in the posterior $2/3$ portion, bristles in the median lobe above middle, notauli converging posteriorly, not distinct in the hind part, mesoscutum $1.5\times$ as broad as long and $1.69\times$ as long as pronotum medially. Scutellum $1.14\times$ as broad as long in dorsal view and $0.62\times$ mesoscutum medially with two pairs of bristles, one pair above the middle and second pair on the frenal line, frenum partly smooth with longitudinal rugae, area in front of frenum moderately reticulate, frenal area $0.6\times$ as long as rest of the area, posterior margin of scutellum angulate. Dorsellum shiny. Propodeum (Fig.15) medially almost as long as scutellum, smooth without median carina, anterior triangular smooth area reaching almost upto base of nucha, plicae complete, propodeum mostly shiny except for the irregular rugae

in the median area spiracle small, round separated 3× of its diameter from hind margin of metanotum, callus smooth and less hairy, nucha distinct. Hind coxae with uniform transverse carina. Prepectus broad and shiny. Mesopleuron shiny except mesepimeron with transverse rugae; metapleuron shiny. Forewing stumps reaching beyond tip of petiole with 7 bristles.

Metasoma: Gaster (Figs.5,15) long and slender, 3.4× as long as broad in dorsal view, petiole with longitudinal rugae and reticulate, with a pair of brown setae above middle in the anterior part, petiole 1.2× as long as broad, 0.07× as long as gaster and 0.23× as long as T1; gaster including petiole 1.69× as head plus mesosoma combined (without ovipositor), T1 largest, 2.7× as long as T2 medially, T2 1.12× as long as T3, posterior margin of tergites straight.

Material examined: Holotype, ♀, INDIA: Kerala, Idukki, Eravikulam National Park, Chinnanamudi, 20.ix.2014, Coll: P.M. Sureshan. (ZSIK, Reg. No. ZSI/WGRC/IR/INV/4080).

Etymology: The species derives its name from the angulate nature of pronotal carina.

Remarks: Among the brachypterous species, this species is unique in having uniform brownish black colour in the distal 2/3 portion of mesoscutum and nautili not meeting posteriorly which is a unique combination of characters not found in similar species. It resembles *D.thirumalai* Sureshan (2013) in general morphology, but *D. thirumalai* differs from it in having notauli meeting in the posterior end, petiole with tuft of setae anteriorly, propodeum with different sculpture and forewing stump very short. It also resembles *D. venkati* Sureshan (2013) in having long wing stumps reaching beyond the tip of petiole, but *D.venkati* has a different propodeum, uniformly black body, different gaster and antenna. In having forewing stump long and pronotum with a distinct transverse carina it also resembles *D. albomaculata* Hedqvist (1963) but *D. albomaculata* has a short gaster, different propodeum and antenna.

3. *Dipara kannurensis* Sureshan & Raseena, sp.n. (Figs.7-9,16)

urn:lsid:zoobank.org:act:37E6B97F-6120-4B18-B48C-965721245501

Holotype: ♀: Length 2.1mm. Black. Face and vertex with metallic bluish green and golden reflection, eyes chocolate brown, ocelli brown; antennae brownish black except basal 2/3 portion of scape, F7 and clava yellowish white. Anterior lateral corners of pronotum brown, mesoscutum and scutellum dorsally with slight metallic tinge. Tegulae brown, wings uniformly smoky, veins brown. Legs testaceous except fore and mid coxae and basal half of hind coxae brown.

Head: (7, 9) In front view width 1.18× length, lower face and gena finely reticulate, face above toruli up to front ocellus coarsely reticulate; malar groove distinct, inter-antennal area raised with a median ridge; gena partly shiny; malar space 0.4× eye length (in profile); clypeus shiny, projecting, front margin convex; a transverse curved ridge below toruli reaching almost up to eye margin on either side; scrobe deep, separated from median ocellus by its diameter, transversely striate. In dorsal view head width 2.4× length; POL 1.37× OOL, vertex closely and

distinctly reticulate, occipital area transversely reticulate. Antennae inserted slightly above lower margin of eye, scape 0.92× as long as eye, pedicellus plus flagellum 1.33× as long as head width, anelli transverse, pedicellus 2.2× as long as broad, 1.11× as long as F1; F2 slightly shorter than F1. Relative lengths of F1 0.9, F2 0.8, F3 0.7, F4 0.65, F5 0.7, F6 0.65, F7 0.6, clava 1.8.

Mesosoma: (Fig.8) Pronotal collar narrow, anteriorly not carinate, almost shiny, neck region transversely reticulate, posterior margin of collar with two strong setae in the middle apart from white pubescence. Mesoscutum 1.94× as broad as long, moderately reticulate with dense white pubescence, setae on mid lobe located just above the center, notauli meeting together subapically, joined by a transverse groove; scapulae with a stout setae near distal margin on either side; axillae moderately and closely reticulate with long and stout hairs. Scutellum distinctly shorter than mesoscutum (0.64×) with a pair of stout setae near transscutellar suture and another on frenal line, area anterior to frenum reticulate, frenal area longitudinally carinate, almost as long as area anterior to it. Propodeum (Figs.8,16) with distinct median carina bifurcate in the form of 'V' anteriorly, rest of the median area with large areolae formed by thick irregular carinae, nucha distinct and shiny, plicae complete, spiracle oval, callus shiny with long white hairs. Prepectus shiny, longer than tegula. Upper mesepimeron with irregular transverse carinae, lower mesepimeron transversely carinate; metapleuron and mesepisternum shiny. Hind coxae with strong transverse carinae dorsally; hind tibia with two unequal spurs. Forewing length 2.8× width, speculum narrow, closed below, basal cell hairy, discal pubescence dense, costal cell with a single row of hairs, marginal fringe moderate. Relative lengths of SMV 4.1, MV 3.5, PMV 2.5, STV 1.4.

Metasoma: Gaster (Figs.8, 16) including petiole 1.05 × as long as head plus mesosoma combined, petiole 1.5× as long as broad in dorsal view and 0.37 as long as length of T1, 0.41× as long as the length of hind coxa laterally, posteriorly little wider, distinctly carinate except on dorso-medial area shiny with a pair of white setae almost at the middle.

Material examined: Holotype, female, INDIA: Kerala, Kannur, Kolassery, 08.vi.2014, Coll. Anjana. (ZSIK, Reg. No. ZSI/WGRC/IR/INV/4078).

Paratype: One ♀, Kerala, Calicut, Chalappuram, 29.iv.2013, Coll. Shweta. (ZSIK, Reg. No. ZSI/WGRC/IR/INV/4082).

Etymology: The species derives its name from the name of the type locality, Kannur.

Remarks: *Dipara kannurensis* closely resembles *Dipara hayati* (Sureshan, 2013) in general morphology, but differs from it in having pronotal collar with two strong setae medially apart from white pubescence, bristles on mid lobe of mesoscutum located just above the centre, scutellum with frenal area broad, almost as long as rest of area in front and partly shiny; propodeum with areolae larger, formed by thick carinae; forewing smoky; gaster including petiole as long as head plus mesosoma combined and petiole with pair of setae almost in the

centre (in *hayati* pronotal collar with a row of four strong setae near posterior margin besides general pubescence, setae on mid lobe of mesoscutum located little below middle, frenal area of scutellum shorter than (0.8×) rest of the area with distinct longitudinal ridges ; propodeum with areolae in the median area not strong and formed by thin carinae; gaster including petiole little longer than head plus mesosoma combined , petiole distinctly ridged with pair of setae very close to anterior margin; forewing less smoky, almost hyaline)

4. *Dipara yercaudensis* Sureshan, sp. n. (Figs. 10-13)

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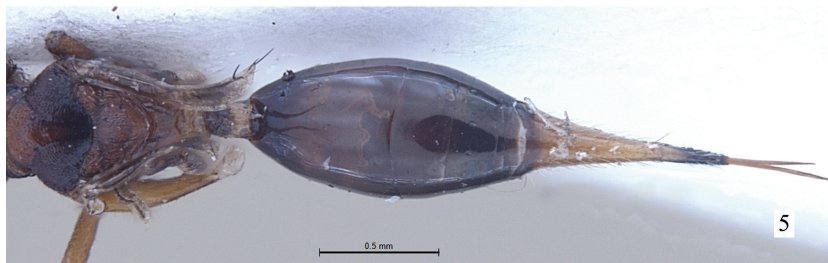
Holotype: ♀: Length 2.3mm. Body honey brown except mesoscutum (almost completely), and scutellum (completely) black. Tinge, eyes and ocelli silvery white. Antennae with scape pale brown except upper half whitish and distal tip blackish, pedicel black, F1, F2 and F6 testaceous, F3 yellowish brown, F4 and F5 brownish black, F7 and clava whitish yellow; Forewing stump dark brown. Legs honey brown except hind coxae, basal part of hind femora and base of tibiae white. Gaster mostly brownish black with basal half of epipygium testaceous; T1 dorsally with violaceous tinge.

Head: (10,12) In front view width 1.4× length, uniformly moderate reticulate, genae partly shiny, malar groves distinct, malar space 0.41× eye length (in profile);eye length 1.8× width in profile; clypeus smooth , little raised , anterior margin sub truncate. In dorsal view head width 1.96× length, POL 1.75× OOL. Antennae inserted at the lower ocular line, scape 0.64× as long as eye, pedicellus plus flagellum 1.1× as long as head width, anelli transverse, pedicel 2× as long as broad and 1.4× as long as F1. All funicular segments with one row of long sensillae, clava as long as three preceding segments combined. Relative lengths of antennal segments:F1 1.1, F2 1.15, F3 1, F4 0.85, F5 0.95, F6 0.85, F7 0.95, clava 2.4.

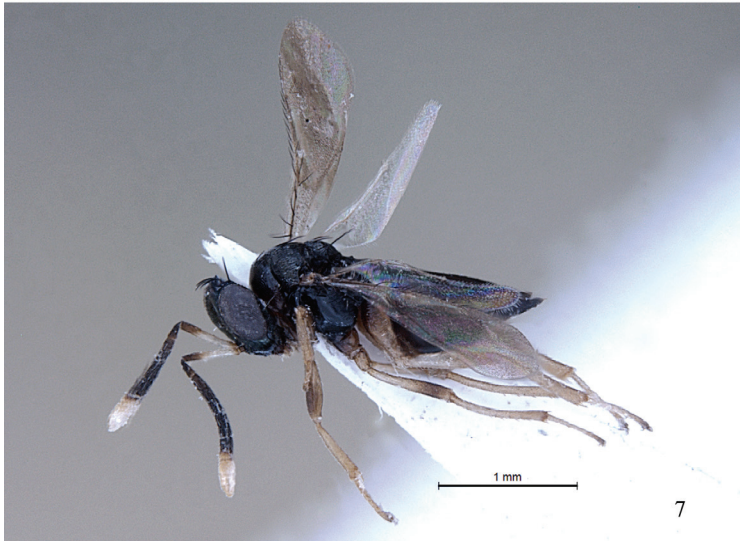
Mesosoma: Pronotum (Fig.11) moderately reticulate, collar broad with a row of stout setae near posterior margin in addition to the uniform short pubescence, carinate anteriorly with a smooth strip on the posterior margin merging with the smooth strip on anterior margin of mesoscutum. Mesoscutum 2.5× as broad as long, moderately reticulate with uniform white pubescence, seate on mid lobe located below middle, one seta on lower corner of scapulae on either side, notauli not meeting posteriorly, Scutellum medially 0.43× length of mesoscutum, frenum very narrow represented by a line of short rugae, posterior rim not visible, a pair of stout setae at the middle and another pair on frenal line. Propodeum (Figs.13) with distinct median carina, connected to small “V” shaped carina anteriorly, remaining areas uniformly with strong longitudinal rugae, in a sub circular form, plicae complete, spiracle small, round, separated from hind margin of metanotum by 4.6× its diameter, nucha distinct, callus less hairy. Mesopleuron transversely carinated except shiny in the middle; metapleuron shiny. Prepectus shiny, longer than tegula. Hind coxae with strong transverse rugae in the upper half, hind tibia with two unequal spurs. Forewing stump 4.5× as long as broad with 6 long bristles on the total length of vein.



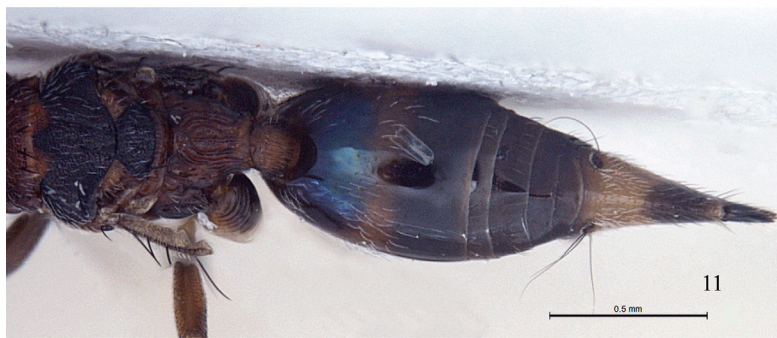
Figs.1-3. *Dipara andamanensis* Sureshan & Raseena sp.n. Female, 1, body profile view; 2, meosoma and metasoma dorsal view; 3, head front view



Figs. 4-6. *Dipara angulata* Sureshan& Nikhil sp.n. Female, 4, body profile view; 5, meosoma and metasoma dorsal view; 6, head front view



Figs. 7-9. *Dipara kannurensis* Sureshan & Raseena sp.n. Female, 7, body profile view; 8, meosoma and metasoma dorsal view; 9, head front view



Figs. 10-12. *Dipara yercaudensis* Sureshan sp.n. Female: 10. body profile view; 11. mesosoma and metasoma dorsal view; 12, head front view

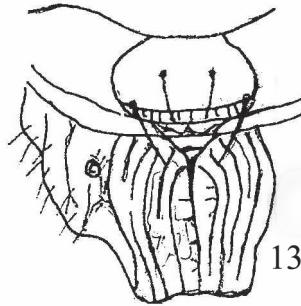
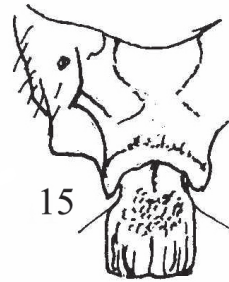
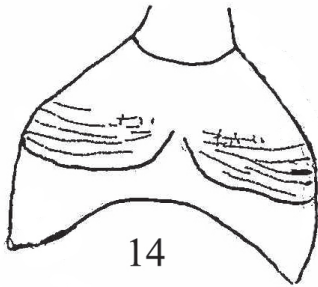
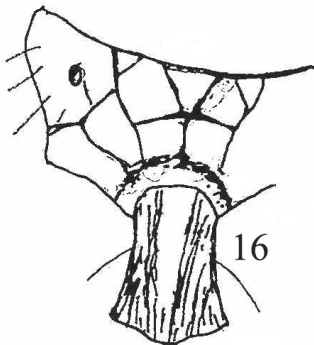


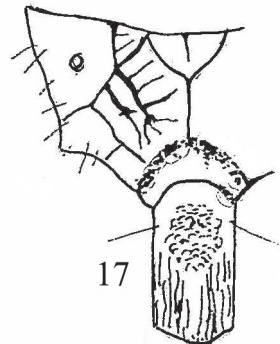
Fig. 13. *D.yercaudensis* scutellum and propodeum dorsal view



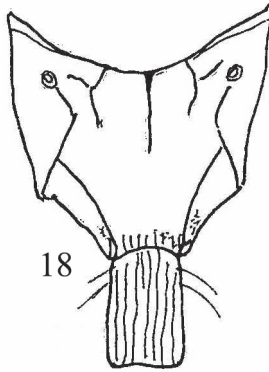
14-15. *D.angulata* 14, pronotum dorsal view; 15, propodeum and petiole dorsal view



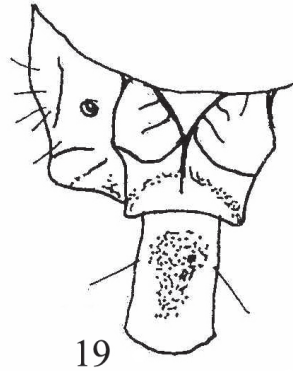
16, *D.kannurensis* propodeum and petiole dorsal view



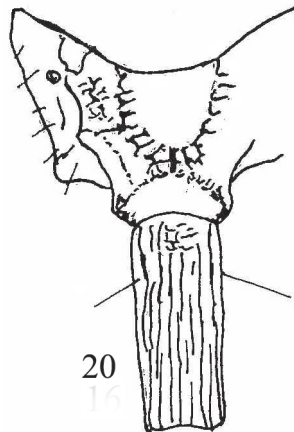
17, *D.nigra* Sureshan, propodeum and petiole dorsal view



18, *D.intermedia* Sureshan & Narendran, propodeum and petiole dorsal view



19, *D.venkati* Sureshan, propodeum and petiole dorsal view



20, *D. andamanensis* propodeum and petiole dorsal view

Metasoma: Gaster(Fig.11) including petiole 1.18× as long as head plus mesosoma combined, petiole 0.21× as long as dorsal length of T1 and 1.07× as long as broad in dorsal view, longitudinally carinate with 2 pairs of setae near the base, T1 longest, reaching 0.4× length of gaster with tuft of white hairs up to to $\frac{3}{4}$ length. T1 length 9.14×T2, posterior margin of tergites straight.

Material examined: Holotype: ♀, INDIA: Tamil Nadu, Yercaud, 23.vii.2014, coll. P.M.Sureshan. (ZSIK, Reg. No. ZSI/WGRC/IR/INV/4081).

Paratype: one female, INDIA: Kerala, Calicut, East hill, Krishna Menon Museum campus, 3.x.2014, coll. Gnana Kumar. (ZSIK, Reg. No. ZSI/WGRC/IR/INV/4083).

Etymology: The species derives its name from the type locality, Yercaud (Tamil Nadu).

Remarks: This species is unique among the other Oriental species in having propodeum with uniform longitudinal rugae arranged in a sub-circular form, mesoscutum (except at anterior “W” shaped yellow area) almost black and scutellum with a very narrow frenalum. In having similar propodeum, longitudinally striated pleurae, and a short petiole it resembles the palearctic species *D.striata* (Hedqvist, 1969). However, it differs from *striata* in having gastral petiole uniformly and longitudinally carinate and without a swelling in the middle, T1 long reaching 0.4× length of gaster and scutellum not elevated and with a very narrow frenalum (In *striata*, gastral petiole with a swelling in the middle and finely punctured, gaster with T1 short, not reaching 0.4x length of gaster and scutellum elevated and with a broad frenalum).

Records of species

1. *Dipara debanensis* Sureshan

Dipara debanensis Sureshan, 2013: 80, female. India: Arunachal Pradesh, Namdapha National Park (ZSIK, examined)

Material examined: 1 ♀, India: Arunachal Pradesh, Pasighat, 7.v.2014, coll. P.M.Sureshan (ZSIK, Reg.no. ZSI/WGRC/IR/INV/4075).

Distribution: India: Arunachal Pradesh.

2. *Dipara eukeralensis* Ozdikmen

Dipara keralensis Narendran & Sureshan, 2001: 452, female. India, Kerala, Parambikulam (ZSIK, examined) Pre-occupied by *Dipara keralensis* (Narendran, in Narendran et al., 2000).

Dipara eukeralensis Ozdikmen, 2011: 843. Replacement name for *D. keralensis* Narendran & Sureshan, 2001. Sureshan, 2013: 85.

Material examined: 1 ♀, India: Kerala, Calicut Medical College campus, 18.ix.2013, coll. Swetha (ZSIK, Reg.No. ZSI/WGRC/IR/INV/3998).

Distribution: India: Kerala.

3. *Dipara gastra* (Sureshan & Narendran)

Grahamisia gastra Sureshan & Narendran, 2004:1616, female. Sri Lanka, Candy dist. (UCDC, examined).

Dipara gastra (Sureshan & Narendran): Desjardins, 2007: 52. Sureshan, 2013: 87.

Material examined: 3 females, India: Kerala, Calicut, Mayanad, 7.i.2014, coll. Shweta (ZSIK, Reg. No. ZSI/WGRC/IR/INV/3996); 1 female, Kerala, Calicut Medical College, campus, 18.ix.2013,

coll. Shweta (ZSIK, Reg. No. ZSI/WGRC/IR/INV/3997); 1 female, Kerala, Calicut, Kakayem, 1.iv.2014, coll. Shweta (ZSIK, Reg. No. ZSI/WGRC/IR/INV/3999).

Distribution: India (**Present record**); Sri Lanka.

4. *Dipara hayati* Sureshan

Dipara hayati Sureshan, 2013: 81, female. India, Kerala, Chittur (ZSIK, examined).

Material examined: 1 ♀, India: Kerala, Palghat, Varadimala, 22.ii.2012, coll. P.M. Sureshan (ZSIK, Reg.No. ZSI/WGRC/IR/INV/4077); 1 female, Kerala, Idukki, Mannavanshola National Park, 17.ix.2014, coll. P.M. Sureshan (ZSIK, Reg. No. ZSI/WGRC/IR/INV/4073)

Distribution: India: Arunachal Pradesh, Kerala (**Present record**)

5. *Dipara malabarensis* (Narendran & Mini)

Grahamisia malabarensis Narendran & Mini, 2000: 371, female. India, Kerala, Calicut University Campus (ZSIK, examined).

Dipara malabarensis (Narendran & Mini): Desjardins, 2007: 53. Sureshan, 2013: 85.

Material examined: 1 ♀, India: Tamil Nadu, Dindigul, Shembaganur, 2.iv.2014, Coll. P.M.Sureshan (ZSIK, Reg. No. ZSI/WGRC/IR/INV/4074).

Distribution: India: Kerala, Tamil Nadu (**Present record**).

6. *Dipara nigriscuta* Sureshan

Dipara nigriscuta Sureshan, 2013: 78, female. India, Arunachal Pradesh, Namdapha National Park (ZSIK, examined)

Material examined: 1 ♀, India: Kerala, Kannur, Paithalmala, 8.i.2013, coll. Sureshan (ZSIK, Reg.no. ZSI/WGRC/IR/INV/4076)

Distribution: India: Arunachal Pradesh, Kerala (**Present record**).

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REFERENCES

- Bouček Z. (1988). Australasian Chalcidoidea (Hymenoptera). A biosystematic revision of genera of fourteen families, with a reclassification of species. CAB International Wallingford: pp.832.
- Desjardins C.A. (2007). Phylogenetics and classification of the world genera of Diparinae (Hymenoptera: Pteromalidae). *Zootaxa*, 1647:1–88.
- Gibson G.A.P. (1997). Morphology and Terminology. Chapter 2. pp 16–44. In: Annotated keys to the genera of *Nearctic*, Chalcidoidea (Hymenoptera), (Gibson, G.A.P., Huber, J.T. and Wooley, J.B. Eds.) NRC Research Press, Ottawa, Ontario, Canada, 794 pp.
- Girault A.A. (1915). Australian Hymenoptera Chalcidoidea –VI. Supplement. *Mem. Queensland Museum*.3: 313–346.
- Huang D.W. and Xiao, H. (2005). Hymenoptera: Pteromalidae. *Fauna Sinica. Insect*.42:267.
- Narendran T.C. and Mini T.V. (2000). A key to the species of *Grahamisia* Delucchi (Hymenoptera: Pteromalidae: Diparinae) with description of a new species from India. *Zoos' print Journal*, 15 (12):371–374.
- Narendran T.C., Mini T.V. and Karmaly K.A. (2000). A new species of *Parurios* Girault (Hymenoptera: Pteromalidae: Diparinae) from Kerala (India). *Bulletin of Pure and Applied Sciences*, 19A(2):137–140.
- Narendran T.C., Sabu K. Thomas and Sinu P.A. (2006). A revision of Indian species of *Parurios* Girault with a new record of *Papuopsia* Boucek (Hymenoptera: Pteromalidae) from India. *Journal of biological science*, 14:17–23.
- Narendran T.C. and Sureshan P.M. (2001). Description of three new species of *Dipara* Walker (Hymenoptera: Pteromalidae) from India. *Zoo's print Journal*, 16A (4):451–456.
- Noyes J.S. (2003). Universal Chalcidoidea Database. World Wide Web electronic publication. <http://www.nhm.ac.uk/chalcidoids>. Last updated May 2014. (Accessed in December 2014).
- Ozdikmen H. (2011). New names for some preoccupied specific epithets in Chalcidoidea II: Families-Eupelmidae, Eurytomidae, Mymaridae, Perilampidae, Pteromalidae, Torymidae (Hymenoptera: Parasitica). *Munis Entomology and Zoology*, 6(2):832–855.
- Sureshan P.M. (2013). A taxonomic revision of Oriental *Dipara* Walker (Hymenoptera: Chalcidoidea: Pteromalidae) with descriptions of six new species from India. *Records of Zoological Survey of India*, 113(1):75–93.
- Sureshan P.M. and Narendran T.C. (2004). Description of new species of *Grahamisia* Delucchi from Sri Lanka and key to the world species (Hymenoptera: Chalcidoidea: Pteromalidae). *Zoos' print Journal*19(9):1616–1618.
- Sureshan P.M. and Narendran T.C. (2005). A new species of *Dipara* Walker (Hymenoptera: Pteromalidae) from Sri Lanka and Key to species to the Indian subcontinent. *Records of Zoological Survey of India*, 105(1–2):105–109.
- Walker F (1833). Monographia Chalcidum (continued). *Entomology monthly Magazine*, 1: 115- 142, 367–384.
- Xiao H. and Huang D.W. (1999) A new species of *Grahamisia* (Hymenoptera: Pteromalidae) from China. *Oriental Insects*, 33:333–335.

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