

# Description of a new species of *Dipara* Walker (Hymenoptera: Pteromalidae) from southern Western Ghats, India with taxonomic notes on Indian species

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## Abstract

A new species of *Dipara* Walker, *Dipara wayanadensis* Surya and Sureshan **sp. nov.** from southern Western Ghats region of Kerala, India is described. The new species is described, illustrated and compared with congeneric and a modified key to the Indian species of *Dipara* is also provided.

**Keywords:** *Dipara*, Hymenoptera, Key, New Species, India, Pteromalidae, Southern Western Ghats

## Introduction

The genus *Dipara* Walker currently contains 56 species worldwide, with 25 species known from the Oriental Region and 22 from the Indian sub-continent (Sureshan *et al.*, 2015; Noyes, 2019). The very evident sexual dimorphism displayed by these remarkable parasitoids makes them subjects of great interest in the taxonomist's eyes. In nature, the females of the genus are usually brachypterous whereas the males are found to be macropterous (Laszlo, 2005).

The *Dipara* species currently known from India are *D. andamanensis* Sureshan and Raseena, 2015, *D. angulata* Sureshan and Nikhil, 2015, *D. boučeki* (Narendran, 2006), *D. debanensis* Sureshan, 2013, *D. elevata* Sureshan, 2018, *D. eukeralensis* Özdikmen, 2011, *D. gastra* Sureshan and Narendran, 2004, *D. hayati* Sureshan, 2013, *D. kannurensis* Sureshan and Raseena, 2015, *D. keralensis* (Narendran, 2000), *D. malabarensis* (Narendran & Mini, 2000), *D. miniae* Narendran and Sureshan, 2001, *D. mohanae* Narendran and Sureshan, 2001, *D. nigra* Sureshan, 2013, *D. nigriscuta* Sureshan, 2013, *D. nitidofrena* Sureshan, 2018, *D. ponmudiensis* Sureshan and Farsana, 2015, *D. sringericus* (Narendran, 2006), *D. tamila* Sureshan, Girish Kumar and Sheeja, 2017, *D. thirumalaii* Sureshan, 2013,

*D. venkati* Sureshan, 2013 and *D. yercaudensis* Sureshan, 2015.

Studies on further specimens collected from the southern Western Ghat region of Wayanad district of Kerala yielded an undescribed species which is being described here. Key to Indian species of *Dipara* (Sureshan *et al.*, 2018) is amended to incorporate the new species.

## Materials and Methods

The specimens for the present study were collected using yellow pan traps from Chandanathodu (11°50'22.5096"N and 75°48'26.3952"E) in Periya, high altitude locality in Wayanad district of Kerala falling under the megadiverse biodiversity hotspot of India, the Western Ghats. The specimens preserved in 70% alcohol were later dried, card mounted and studied under Leica M 205A stereoscopic binocular microscope and imaged using attached Leica DFC 500 camera. Measurements were obtained using Leica LAS (Leica Application Suite V3.80). Specimens from the National Collections of Zoological Survey of India, Western Ghat Regional Centre, Kozhikode (ZSIK) were also examined. Images at varying focal planes were stacked into a single image using Leica Automontage Software V4.2 and final illustrations were post-processed

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for contrast and brightness using Adobe® Photoshop® CS5 (Version 12.0 x64). The type specimens of the new species are deposited in the 'National Zoological Collections' of the Zoological Survey of India, Western Ghat Regional Centre, Kozhikode (ZSIK).

## Museum Abbreviations

**UCDC:** University of California, R. M. Bohart Museum of Entomology, California, United States of America; **ZSIC:** National Zoological Collections, Headquarters, Zoological Survey of India, Calcutta, India; **ZSIK:** National Zoological Collections, Western Ghat Regional Centre, Zoological Survey of India, Kozhikode, India.

## Terms and Measurements

Abbreviations of the terms are as follows: **fu<sub>x</sub>**: funicular segment, x being the funicle number; **Gt<sub>x</sub>**: Gastral tergum number; **OOL**: ocello-ocular distance; **POL**: post-ocellar distance.

## Results

Genus *Dipara* Walker, 1833

*Dipara* Walker, *Ent. Mon. Mag.*, 1: 371-373. Type species *Dipara petiolata* Walker by monotypy.

Noyes (2019) provides the complete list of synonymy, hence not repeated here.

**Distribution:** Palearctic, Nearctic, Australian, Oriental and Ethiopian regions (Noyes, 2019).

**Hosts:** Unknown. An undescribed Indian species (under *Parurios*) was reared from a curculionid beetle feeding on the roots of *Cyperus* (Bouček, 1988).

***Dipara wayanadensis*** Surya and Sureshan **sp. nov.**

**Type material:** **Holotype Female**, mounted on triangular card. **India:** Kerala, Wayanad district, Chandanathod, Periya (11°50'22.5096"N and 75°48'26.3952"E), 04.ii.2021, Coll. K. A. Subramanian, (ZSIK. Reg. No. IR/INV/20253). **Paratype.** 2 Females, Kerala, Wayanad district, Chandanathod, Periya (11°50'22.5096"N and 75°48'26.3952"E), 04.ii.2021, Coll. K. A. Subrahmanian, (ZSIK. Reg. Nos. IR/INV/20254 & IR/INV/20255).

**Description:** Holotype Female. Body length 2.92 mm, length of fore wing stump 0.57 mm.

**Colour:** Body dark brown; eyes dark; antenna black, lower side of pedicel yellowish white, clava and preceding funicle yellowish white; mesoscutum almost black; scutellum with semi-circular dark patch; axillae yellowish brown; fore wing stump dark brown; bristles of body black; legs with fore coxa and mid coxa brown, hind coxa yellowish white with a black patch antero-dorsally; apical half of femora yellowish white, rest brown; fore and mid tibia anteriorly black rest brown; hind tibia with basal half brownish black, rest yellowish white; all tarsus pale yellow; Gt<sub>1</sub> with horizontal wide yellowish band dorsally; Gt<sub>5</sub> and Gt<sub>6</sub> yellow, rest black.

**Head:** In dorsal view width 3.45 × length; in frontal view width 1.20 × height; temple narrow, malar space 0.44 × eye length; POL 0.81 × OOL; eye length 1.84 × width (in profile); regularly punctate reticulate; reticulation fine on gena; malar groove distinct; scrobe deep, reaching half-length of face, parascrobal area transversely striate reticulate, tentorial pits distinct; clypeus with fine striae, mandibles tridentate; vertex almost straight, with three pairs of long bristles; occipital area finely reticulate with faint carina far below; toruli separated by distance equal to their individual diameter; antenna inserted almost level with lower margin of eye, antennal formula 11173, scape 0.85 × as long as eye, pedicel plus flagellum 2.98 × as long as scape, pedicel length 1.95 × width, fu<sub>1</sub> 0.83 × as long as pedicel, clava little longer than preceding 3 segments combined; all funicular segments with four rows of long white sensillae.

**Mesosoma:** Length 1.4 × width, pronotum width 3.06 × median length in dorsal view; striate reticulate, two pairs of strong black long bristles arising from posterior half, presence of white smaller setae in lower half; mesoscutum 0.71 × as broad as long, finely punctate, almost completely black except for small area anteriorly; scutellum with pair of black strong bristles arising antero-medially and pair present in posterior corners; mesoscutum and scutellum covered with sparse white pubescence; notauli distinct, complete, converging posteriorly; scutellum raised, medially 0.11 × as long as mesoscutum, frenal area almost shiny with fine rugae in hind part; propodeum width 1.1 × median length, almost completely shiny, with irregular rugae; distinct median carina present, connected to V shaped small carina anteriorly; nucha distinct, plicae finely indicated anteriorly; spiracle small, round; callus without setae; mesopleura, metapleura, and prepectus

smooth and shiny; hind coxae with strong transverse rugae in upper half; hind tibia with two unequal spurs; fore wing stump long, reaching beyond petiole, with seven strong bristles;  $5.4 \times$  as long as broad.

**Metasoma:** Petiole short,  $0.4 \times$  as long as hind coxa, smooth and shiny; metasoma elongate, ovate,  $1.84 \times$  as long as wide (without petiole) in dorsal view,  $0.6 \times$  as long as head plus mesosoma (including petiole) in dorsal view,  $Gt_1$  largest,  $0.57 \times$  length of metasoma (without petiole); posterior margin of terga straight;  $Gt_2$  with pair of bristles arising posteriorly; dense white pubescence present on lower one third of metasoma; ovipositor and ovipositor sheath slightly exerted.

**Diagnosis:** The species resembles *Dipara thirumalaii* Sureshan in general morphology but differs from the same in having: 1) head punctate reticulate,  $3.45 \times$  as broad as long in dorsal view (in *D. thirumalaii* head moderately reticulate,  $2.2 \times$  as broad as long in dorsal view); 2) pronotum striate reticulate with no distinct transverse carina (in *D. thirumalaii* pronotum transversely ridged reticulate with distinct transverse carina); 3) mesoscutum  $0.71 \times$  as broad as long, finely punctate (in *D. thirumalaii* mesoscutum  $1.6 \times$  as broad as long, moderately raised reticulate); 4) propodeum width  $1.1 \times$  median length, almost completely shiny, with irregular rugae; distinct median carina present, connected to a V shaped small carina anteriorly (in *D. thirumalaii* propodeum  $1.8 \times$  as broad as long with an irregular median carina connected to irregular transverse carinulae); 5) fore wing stump long, reaching beyond petiole, with seven strong bristles (in *D. thirumalaii* fore wing stump reaching up to propodeal spiracle with one short and one long bristle in the middle).

**Etymology:** The species name is derived from the district name Wayanad from where the specimens are collected.

**Distribution:** India: Kerala.

**Host:** Unknown.

**Remarks:** All the specimens for the present study are obtained from yellow pan traps, the species being brachypterous and forest floor dwellers.

***Dipara andamanensis*** Sureshan and Raseena, 2015

*Dipara andamanensis* Sureshan and Raseena, 2015, *Entomon*, **39**(1): 47–49, Holotype Female (**ZSIK**).

**Distribution:** India: Andaman and Nicobar Islands.

**Remarks:** So far, the species is only reported from Andaman and Nicobar Islands.

***Dipara angulata*** Sureshan and Nikhil, 2015

*Dipara angulata* Sureshan and Nikhil, 2015, *Entomon*, **39**(1):49–50, Holotype Female (**ZSIK**).

**Distribution:** India: Kerala.

**Remarks:** So far, the species is only reported from Kerala. The species is unique in having uniform brownish black colour in the distal two-thirds of the mesoscutum, which distinguishes it from the other brachypterous species of the genus.

***Dipara boučeki*** (Narendran, 2006)

*Parurios boučeki* Narendran, in Narendran *et al.*, 2006, *J. bio-sci*, **14**: 20, Holotype Female (**ZSIK**).

*Dipara boučeki* (Narendran): Sureshan, 2013, *Rec. Zool. Surv. India*, **113**(1): 86.

**Material examined:** 1Female, mounted on triangular card, India, Kerala, Kollam, Shendurney Wildlife Sanctuary, Kattilappara, 06.xii.2021, Coll. P. Girish Kumar, (ZSIK. Reg. No. IR/INV/ 19696).

**Distribution:** India: Karnataka, Kerala.

**Remarks:** Earlier *Parurios* was synonymised under *Dipara*, but the species *boučeki* Narendran was not treated by Desjardins, 2007. Later, Noyes, 2019 treated this species under *Dipara*.

***Dipara debanensis*** Sureshan, 2013

*Dipara debanensis* Sureshan, 2013, *Rec. zool. Surv. India*, **113** (1): 80–81, Holotype Female (**ZSIK**).

**Distribution:** India: Arunachal Pradesh.

**Remarks:** So far, the species is only reported from Arunachal Pradesh.

***Dipara elevata*** Sureshan, 2018

*Dipara elevata* Sureshan, 2018, *Entomon* **43**(2): 80–82, Holotype Female (**ZSIK**).

**Distribution:** India: Tamil Nadu, Kerala.

**Remarks:** The species is unique in having antenna inserted at a prominent elevation on the face. So far, the species is only reported from Tamil Nadu and Kerala.

***Dipara eukeralensis* Özdikmen, 2011**

*Dipara keralensis* Narendran and Sureshan, 2001, *Zoos' Print Journal*, **16**(4): 452, Holotype Female (ZSIK). Junior sec homonym (Noyes, 2019).

*Dipara eukeralensis* Özdikmen, 2011, Replacement name, *Munis Ent. Zool*, **6**(2): 843.

**Distribution:** India: Kerala.

**Remarks:** The species name *keralensis* was preoccupied in the genus and renamed by Özdikmen (2011).

***Dipara gastra* (Sureshan and Narendran, 2004)**

*Grahamsia gastra* (Sureshan and Narendran, 2004), *Zoos' Print Journal*, **19**(9): 1616–1617, Holotype Female (ZSIK).

*Dipara gastra* (Sureshan and Narendran), 2007, transferred by Desjardins, 2007. *Zootaxa*, 1647: 52.

**Materials examined:** 1Female, India: Kerala, Wayanad, Periya campshed, 10.ii.2021, Coll. K.A. Subramanian, (ZSIK. Reg. No. IR/INV/17989); 1Female, India: Kerala, Kozhikode, Vilakkottur, 30.v.2021, Coll. K.P. Hanima Raveendran, ZSIK. (Reg. No. IR/INV/ 18636).

**Distribution:** Sri Lanka: Central Province; India: Kerala.

**Remarks:** The species resembles *D. malabarensis* (Narendran and Mini) but differs in the nature of gaster with a distinct yellow band overlapping  $Gt_1$  and  $Gt_2$  and forewing stump with four setae.

***Dipara hayati* Sureshan, 2013**

*Dipara hayati* Sureshan, 2013, *Rec. zool. Surv. India*, **113** (1): 81–82, Holotype Female (ZSIK).

**Materials examined:** 1 Female, India: Kerala, Wayanad, Periya, 14.ii.2021, Coll. K.A. Subramanian, (ZSIK. Reg. No. IR/INV/ 17590); 1 Female, India, Kerala, Wayanad, Muthanga, 07.ii.2021, Coll. K.A. Subramanian, (ZSIK. Reg. No. IR/INV/ 17591); 1 Female, India, Tamil Nadu, Kanyakumari, Kanyakumari WLS, 15.ii.2020, Coll. Souvik Sen, (ZSIK. Reg. No. IR/INV/17592); 1 Female, India, Tamil Nadu, Tirunelveli, Ambasamudram, 24.vii.2019, Coll. B.H.C.K. Murthy, (ZSIK. Reg. No. IR/INV/17593).

**Distribution:** India: Kerala, Tamil Nadu.

**Remarks:** Specimens collected from various parts of Kerala and Tamil Nadu are also studied.

***Dipara intermedia* Sureshan and Narendran, 2005**

*Dipara intermedia* Sureshan and Narendran, 2005, *Rec. zool. Surv. India*, **105**(1–2): 105–109, Holotype Female (UCDC).

**Material examined:** 1 Female, India: Kerala, Wayanad, Chandhanathodu, 14.ii.2021, Coll. K.A. Subramanian, (ZSIK. Reg. No. IR/INV/ 17661).

**Distribution:** Sri Lanka: Central Province; India: Kerala.

**Remarks:** This species shows intermediate characters between *D. mohanae* and *D. eukeralensis*.

***Dipara kannurensis* Sureshan and Raseena, 2015**

*Dipara kannurensis* Sureshan and Raseena, 2015, *Entomon*, **39**(1): 50–52, Holotype Female (ZSIK).

**Materials examined:** 1 Female, mounted on triangular card, India: Kerala, Wayanad, Chandanathod, 14.ii.2021, Coll. K. A. Subramanian, (ZSIK. Reg. No. IR/INV/17659).

**Distribution:** India: Kerala.

**Remarks:** The species resembles *D. hayati* Sureshan but differs in having pronotal collar with two strong setae and fore wing smoky.

***Dipara keralensis* (Narendran, 2000)**

*Parurios keralensis* Narendran, in Narendran *et al.*, 2000, *Bull. Pure and Appl. Sci.*, **19A** (2): 137, Holotype Female (ZSIK).

*Parurios keralensis* Narendran *et al.*, 2006, *J. Bio. Sci.*, **14** (4): 21–22.

*Dipara keralensis* (Narendran): Özdikmen, 2011, *Mun. Ent. Zool.*, **6**(2): 843, Senior homonym.

**Material examined:** 1 Female, India, Kerala, Wayanad, Muthanga, 23.ii.2021, Coll. K. A. Subramanian, (ZSIK. Reg. No. IR/INV/17662).

**Distribution:** India: Kerala, Uttar Pradesh.

**Remarks:** Noyes (2019) treated *Parurios keralensis* Narendran, 2000 under *Dipara* (*Dipara keralensis*) following the synonymy of *Dipara* by Desjardins, 2007.

***Dipara malabarensis* (Narendran and Mini, 2000)**

*Grahamsia malabarensis* Narendran and Mini, 2000, *Zoos' Print Journal*, **15**(12): 371–373, Holotype Female (ZSIK).

*Dipara malabarensis* (Narendran and Mini), 2007, transferred by Desjardins, *Zootaxa*, **1647**: 53.

**Distribution:** India: Kerala.



**Remarks:** This species resembles *D. gastra* (Sureshan and Narendran) but differs in having plicae not united in the centre to form a “V” and fore wing stump with three setae.

***Dipara miniae*** Narendran and Sureshan, 2001

*Dipara miniae* Narendran and Sureshan, 2001, *Zoos' Print Journal*, **16**(4): 453–455, Holotype Female (**ZSIK**).

**Distribution:** India: Kerala.

**Remarks:** The species shows affinities to *D. nigriscuta* Sureshan but differs in having mesoscutum devoid of black patch or band with bristles little above centre.

***Dipara mohanae*** Narendran and Sureshan, 2001

*Dipara mohanae* Narendran and Sureshan, 2001, *Zoos' Print Journal*, **16**(4): 455–456, Holotype Female (**ZSIK**).

**Distribution:** India: Kerala.

**Remarks:** So far, the species is only reported from Kerala.

***Dipara nigra*** Sureshan, 2013

*Dipara nigra* Sureshan, 2013, *Rec. zool. Surv. India*, **113** (1): 83–84, Holotype Female (**ZSIK**).

**Distribution:** India: Arunachal Pradesh.

**Remarks:** This species resembles *D. elevata* Sureshan but differs in body colour, antenna, metasoma and wings.

***Dipara nigriscuta*** Sureshan, 2013

*Dipara nigriscuta* Sureshan, 2013, *Rec. zool. Surv. India*, **113**(1): 78–79, Holotype Female (**ZSIK**).

**Distribution:** India: Arunachal Pradesh.

**Remarks:** The species can be easily distinguished by the blackish band on the posterior one-third of its mesoscutum and bristles in the center of mesoscutum.

***Dipara nitidofrena*** Sureshan, 2018

*Dipara nitidofrena* Sureshan, 2018, *Entomon*, **43**(2): 82–83, Holotype Female (**ZSIK**).

**Distribution:** India: Nagaland.

**Remarks:** The species is unique in having shiny scutellum and a deep notauli forming a broad “V”. So far, the species is only reported from Nagaland.

***Dipara ponmudiensis*** Sureshan and Farsana, 2015

*Dipara ponmudiensis* Sureshan and Farsana, 2015, *Journal of insect systematics*, **2**(1): 6–7,

**Distribution:** India: Kerala.

**Remarks:** So far, the species is only reported from Kerala.

***Dipara sringericus*** (Narendran, 2006)

*Parurios sringericus* Narendran, 2006, *J. Bio. Sci.*, **14**(4): 20–21, Holotype Female (**ZSIK**).

*Dipara sringericus* (Narendran) combination for *Parurios sringericus* by Sureshan, 2013, *Rec. zool. Surv. India*, **113**(1): 86.

**Distribution:** India: Karnataka.

**Remarks:** This species closely resembles *D. hayati* Sureshan but differs from it in having a different scutellum, petiole and propodeum.

***Dipara tamila*** Sureshan, Girish Kumar and Sheeja, 2017

*Dipara tamila* Sureshan, Girish Kumar and Sheeja, 2017, *Oriental Insects*, 4–8, Holotype Female (**ZSIK**).

**Distribution:** India: Tamil Nadu.

**Remarks:** This species shows affinities with *D. intermedia* but differs in having different body colour and fore wing stumps with three bristles. So far, the species is only reported from Tamil Nadu.

***Dipara thirumalaii*** Sureshan, 2013

*Dipara thirumalaii* Sureshan, 2013, *Rec. zool. Surv. India*, **113**(1): 79–80, Holotype Female (**ZSIK**).

**Distribution:** India: Uttarakhand.

**Remarks:** Resembles *D. albomaculata* (Hedqvist) but differs from having fore wing stump with two bristles and scutellum without black patch anteriorly. So far, the species is only reported from Tamil Nadu.

***Dipara venkati*** Sureshan, 2013

*Dipara venkati* Sureshan, 2013, *Rec. zool. Surv. India*, **113** (1): 82–83, Holotype Female (**ZSIK**).

**Distribution:** India: Arunachal Pradesh.

**Remarks:** So far, the species is only reported from Arunachal Pradesh.

***Dipara yercaudensis*** Sureshan, 2015

*Dipara yercaudensis* Sureshan, 2015, *Entomon*, **39**(1): 52–59, Holotype Female (**ZSIK**).

**Distribution:** India: Tamil Nadu, Kerala.

**Remarks:** Mesoscutum with a “W” shaped yellow area anteriorly distinguishes it from the other known Indian species of the genus.

### Key to Indian species of *Dipara* Walker (females)

(Modified from Sureshan *et al.*, 2018)

1. Wings reduced (brachypterous)..... **2**  
- Wings fully developed (macropterous)..... **12**
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; mesoscutum almost completely black with characteristic ‘W’ shaped yellowish brown area.....  
.....***D. yercaudensis*** Sureshan
- Propodeum without uniform longitudinal rugae, partly, irregularly carinate 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 posterior end ..... **4**  
- Mesoscutum with notauli meeting in posterior end..... **9**
4. Mesoscutum blackish brown in distal two-thirds; fore wing stump long and narrow reaching beyond tip of petiole; (carina of pronotal collar characteristically angulate and slightly broken in middle).....  
.....***D. angulata*** Sureshan and Nikhil
- Mesoscutum without blackish brown colour as above, fore wing stump very short, not reaching petiole; if body uniformly brownish black, then fore wing stump long and broad, reaching beyond tip of petiole... **5**
5. Fore wing stump  $4.3 \times$  as long as broad, reaching beyond tip of petiole; petiole stout, finely reticulate,  $1.6 \times$  as long as broad; propodeum with characteristic median carina, plica and costula.....***D. venkati*** Sureshan
- Fore wing stump short and narrow, not reaching or just reaching base of petiole; petiole slender, longitudinally carinate, more than  $1.6 \times$  as long as broad; propodeum with or without median carina; plica and costula not as above..... **6**
6. Propodeum with baso-medial area between plica conically elevated up to middle, surface with longitudinal and transverse carinae and striae; wing stump extending well beyond hind margin of scutellum, touching base of petiole and with five or six bristles..... **8**  
- Propodeum with baso-medial area between plicae not conically elevated up to middle, surface almost

- shiny, sometimes with very weak striations; wing stump very short not extending much beyond hind margin of scutellum or if hardly reaching hind margin of nucha then with three bristles..... **7**
7. Fore wing stump very short, only a little longer than tegula, not extending much beyond hind margin of scutellum; fore wing with two bristles; OOL almost as long as POL; antenna with scape as long as eye (in lateral view), pedicel longer than  $fu_1$ ; general body colour yellowish brown.....  
.....***D. intermedia*** Sureshan and Narendran
  - Fore wing stump  $5.2 \times$  as long as tegula, hardly reaching tip of nucha; fore wing with three long bristles; OOL  $1.2 \times$  POL; antenna with scape  $0.8 \times$  as long as eye, pedicel distinctly longer than  $fu_1$  ( $1.8 \times$ ); general body colour dark honey brown.....  
.....***D. tamila*** Sureshan, Girish Kumar and Sheeja
  8. Body length, 2.6 mm; upper face and vertex distinctly reticulate; POL equal to OOL; antenna with  $fu_6$ ,  $fu_7$  and clava whitish yellow;  $fu_2$ – $fu_5$  dark brown; wing stump with five bristles; hind coxae reticulate.....***D. eukeralensis*** Özdikmen
  - Body length, 1.5 mm; upper face and vertex almost shiny, only weakly reticulate; POL shorter than OOL; only  $fu_7$  and clava whitish yellow;  $fu_3$ – $fu_6$  brown; wing stump with six bristles; hind coxae striate reticulate...  
.....***D. mohanae*** Narendran and Sureshan
  9. Fore wing stump with lesser than five bristles; mesoscutum concolourous with the rest of body, with or without black patch..... **10**  
- Fore wing stump with seven bristles; mesoscutum black (except for anterior broad yellowish brown band); (pronotum without transverse carina).....  
.....***D. wayanadensis*** Surya and Sureshan sp. nov.
  10. Mesoscutum without distinct black patch; pronotal carina absent..... **11**  
- Mesoscutum with distinct black patch on distal two-thirds; pronotal carina distinct; (fore wing stump with two bristles of unequal length).....***D. thirumalaii*** Sureshan
  11. Propodeum without median carina; antenna with  $fu_6$  and clava partly ivory coloured; fore wing stump with four bristles... ***D. gastra*** (Sureshan and Narendran)
  - Propodeum with weak median carina in posterior third; antenna with  $fu_6$  completely brown; fore wing stump with three bristles.....  
.....***D. malabarensis*** (Narendran and Mini)
  12. Pronotal collar with separate long and stout bristles near posterior margin in

- addition to pubescence.....16
- Pronotal collar without separate long and stout bristles near posterior margin in addition to pubescence.....13
13. Mesoscutum posteriorly with a black or bluish black patch in lower half of scapulae; petiole long,  $2-2.6 \times$  as long as broad in dorsal view.....14
- Mesoscutum posteriorly without black or bluish black patch in lower half of scapula, sometimes black patch covering all three lobes in posterior third; petiole short,  $1.63 \times$  as long as broad in dorsal view.....15
14. Scapula with bluish black patch distinct and covering almost half length in lower half; petiole  $2 \times$  as long as broad in dorsal view; pronotal collar carinate anteriorly..... *D. debanensis* Sureshan
- Scapula with black patch small, and not sharp, and covering only posterior third; petiole  $2.6 \times$  as long as broad in dorsal view; pronotal collar acarinate anteriorly..... *D. andamanensis* Sureshan and Farsana
15. Mesoscutum without any black patch or band, bristles a little above centre; reticulation of body fine; antenna with  $fu_4$ – $fu_6$  brown ( $fu_4$  partly)..... *D. miniae* Narendran and Sureshan
- Mesoscutum with broad black patch covering all three lobes in posterior third, bristles in centre; reticulation of body coarse; antenna with  $fu_4$ – $fu_7$  brown..... *D. nigriscuta* Sureshan
16. Scrobe long, separated from front ocellus by distance as long as diameter of front ocellus, exceeding well over middle length of eye from toruli.....17
- Scrobe shorter, at most reaching mid-level of eyes from toruli.....23
17. Antenna inserted on an elevated point on face, head very narrow in profile view with eyes small; notauli meeting posteriorly to form a broad 'V' touching transscutal articulation..... *D. elevata* Sureshan
- Antenna inserted not on much elevated point as above, head more thicker in profile than as above; eyes not small as above; if notauli meeting posteriorly then scutellar frenal shiny.....18
18. Scutellar frenal completely shiny except for the crenulate foveae on posterior margin; notauli deep and merging posteriorly to form a broad 'V', mid lobe of mesoscutum little above than the side lobes..... *D. nitidofrena* Sureshan
- Scutellar frenal not shiny; always with longitudinal ridges or sculpture; notauli and mesoscutum different.....19
19. Petiole smooth and shiny without longitudinal

- carina, with maximum posterior width  $1.13 \times$  dorsal length; frenal area of scutellum shorter than scutellar area in front; body large, length 4.5 mm..... *D. sringericus* (Narendran)
- Petiole with distinct longitudinal carina or reticulation, with maximum posterior width  $0.7-1.0 \times$  dorsal length; frenal area almost as long as scutellar area in front; body small, length 1.5–2.7 mm.....20
20. Antenna with anellus wide, distinct;  $fu_1$  anelliform, without sensilla; petiole as long as broad in dorsal view; general pubescence on head and mesosoma long in form of thin bristles..... *D. ponmudiensis* Sureshan and Farsana
- Antenna with anellus not wide as above, less distinct;  $fu_1$  not anelliform, with sensillae; petiole distinctly longer than broad; general pubescence of body short, not in form of bristles as above.....21
21. Petiole long,  $1.7 \times$  as long as broad in dorsal view, dorsally mostly reticulate and with carinae only in hind part; face without metallic blue reflection..... *D. nigra* Sureshan
- Petiole short,  $1.2-1.4 \times$  as long as broad in dorsal view, without reticulation, only longitudinally carinate, carinae sometimes weak medially; face with distinct metallic blue reflection.....22
22. Petiole short,  $1.2 \times$  as long as broad in dorsal view, and with pair of setae very close to anterior margin; pronotal collar with row of four strong setae near posterior margin; bristles on mid lobe of mesoscutum little below middle; fore wing almost hyaline..... *D. hayati* Sureshan
- Petiole long,  $1.4 \times$  as long as broad in dorsal view, and with pair of setae almost in middle; pronotal collar with row of two strong setae near posterior margin; bristles on mid lobe of mesoscutum little above middle; fore wing infumated..... *D. kannurensis* Sureshan and Farsana
23. Fore wing 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. boučeki* (Narendran)
- Fore wing without infumations, hyaline; petiole one-third as long as hind coxa; axillae, head and pronotum black... *D. keralensis* (Narendran)

## Discussion

Diparinae is considered as one of the most intriguing pteromalid subfamily in which the diparines hold an obscure position. They enjoy a cosmopolitan distribution

and have been suspected to be dwellers of forest floor leaf litters (Desjardins, 2007). Specimens are mostly collected in yellow pan traps, especially brachypterous and apterous females and winged males are often encountered in sweep net collections. Life history of the members of the genus is mostly unknown except for an undescribed Indian species (under *Parurios*) reared from a curculionid beetle feeding on the roots of *Cyperus* (Bouček, 1988). *Dipara* can be distinguished from *Netomocera* in having gaster with distinct long petiole with at least one pair of setae on the lateral margins; antenna not strongly clavate and body usually black or honey brown. Brachypterous and apterous females are common when it comes to this genus.

With the addition of a new species *Dipara wayanadensis* Surya and Sureshan **sp. nov.** the total number of species reported from the Indian sub- continent becomes 23. Many species of *Dipara* exhibit very close similarities. The males of the genus also show very close affinities with each other, hence difficult to segregate them from one

another based on external morphology. The identity of the males of the species can be assigned only when both sexes are collected in plenty from the same locality and time, with no other (unknown) *Dipara* specimens.

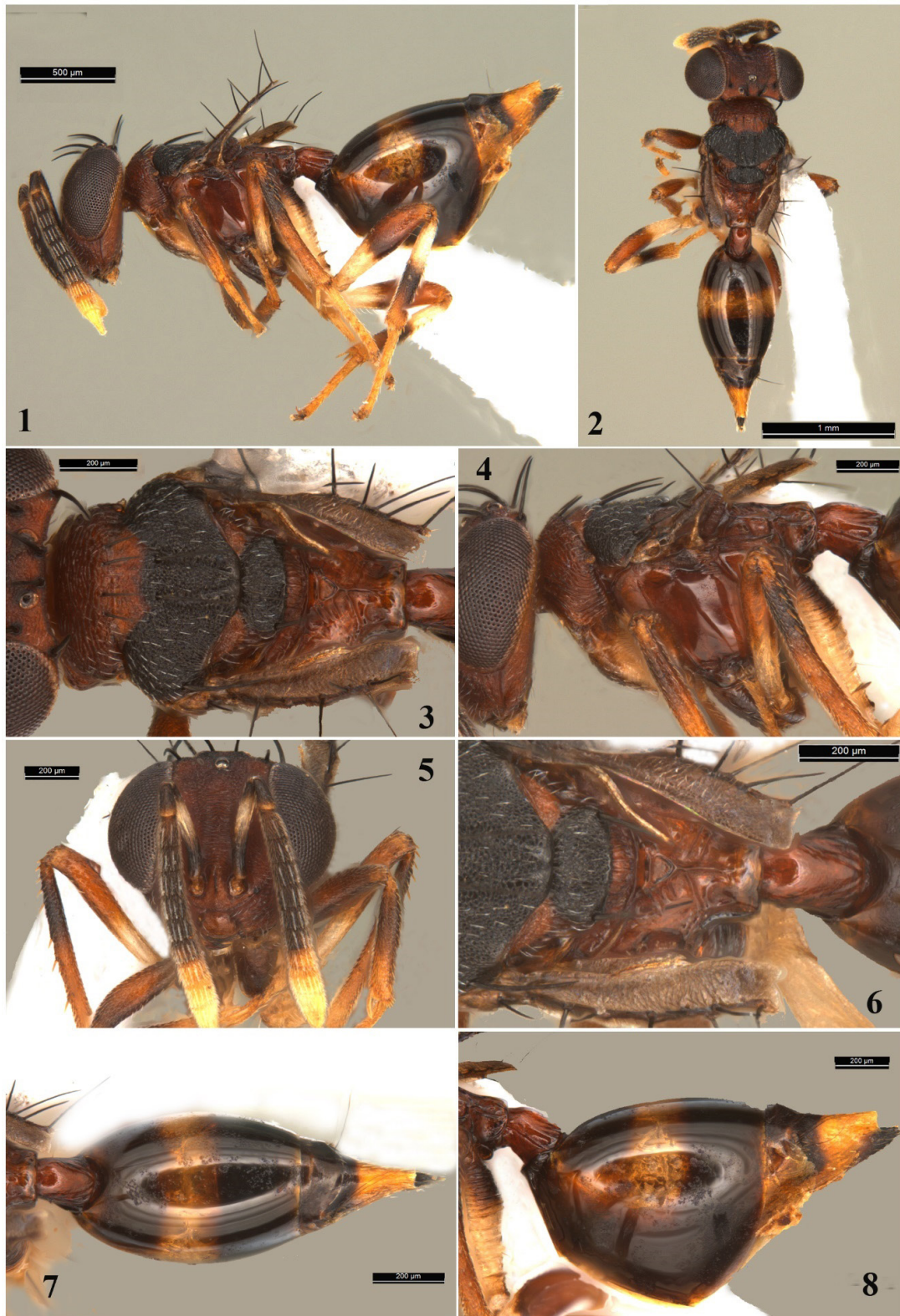
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## References

- Bouček, Z. 1988. Australasian Chalcidoidea (Hymenoptera). CAB. International Wallingford, U.K. pp. 832.
- Desjardins, C.A. 2007. Phylogenetics and classification of the world genera of Diparinae (Hymenoptera: Pteromalidae). *Zootaxa*, **1647**:1-88. <https://doi.org/10.11646/zootaxa.1647.1.1>
- László, Z. 2005. Description of a new species of *Dipara* Walker (Hymenoptera: Pteromalidae) from Hungary. *Acta Zoologica Academiae Scientiarum Hungaricae*, **51**(3):215-220.
- 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*, (A) **19**(2):137-139.
- Narendran, T.C. and Sureshan, P.M. 2001. Descriptions of three new species of *Dipara* Walker (Hymenoptera: Pteromalidae) from India. *Zoos' Print Journal*, **16**(4):453-456. <https://doi.org/10.11609/JoTT.ZPJ.16.4.451-6>
- Narendran, T.C., Thomas, S.K. and Sinu, P.A. 2006. A revision of Indian species of *Parurios* Girault with a new record of *Papuopsia* Bouček (Hymenoptera: Pteromalidae) from India. *Journal of Bio-Science, Rajshahi*, **14**:18-20. <https://doi.org/10.3329/jbs.v14i0.437>
- Noyes, J.S. 2019. Universal Chalcidoidea Database. World Wide Web electronic publication. <http://www.nhm.ac.uk/chalcidoids> Last updated: March, 2019. [Date of access: 08-02- 2022]
- Özdikmen, 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):843.
- Sureshan, P.M. 2013. A taxonomic revision of oriental *Dipara* Walker (Hymenoptera: Chalcidoidea: Pteromalidae) with descriptions of six new species from India. *Records of the Zoological Survey of India*, **113**(1):75-93.
- Sureshan, P.M., Girish Kumar, P. and Manickavasagam, S. 2018. Descriptions of two new species of *Dipara* Walker from India with a revised key to the Indian species. *Entomon*, **43**(2):77-84.
- Sureshan, P.M., Girish Kumar, P. and Sheeja, U.M. 2017. Description of a new species of *Dipara* Walker from Tamil Nadu with a revised key to the Indian species (Hymenoptera: Pteromalidae: Diparinae). *Oriental Insects*, **51**(3):298, 300-303. <https://doi.org/10.1080/00305316.2017.1283255>
- Sureshan, P.M. and Narendran, T.C. 2005. A new species of *Dipara* Walker (Hymenoptera: Pteromalidae) from Sri Lanka and key to the species of Indian subcontinent. *Records of the Zoological Survey of India*, **105**(1-2):105-108. <https://doi.org/10.26515/rzsi/v105/i1-2/2005/159252>
- Sureshan, P.M., Raseena Farsana, V.K. and Nikhil, K. 2015. Description of four new species of *Dipara* Walker (Hymenoptera: Pteromalidae) from India, with records of some species and a key to the Oriental species. *Entomon*, **39**(1):43-62.
- Walker, F. 1833. Monographia Chalciditum. *Entomological Magazine*, **1**(4):371, 373.





**Plates 1-8.** *Dipara wayanadensis* Surya and Sureshan sp. nov. Holotype female. 1. Habitus, lateral view; 2. Habitus, dorsal view; 3. Mesosoma, dorsal view; 4. Mesosoma, lateral view; 5. Head, frontal view; 6. Propodeum, dorsal view; 7. Metasoma, dorsal view; 8. Metasoma, lateral view.