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New findings of *Euurobracon* Ashmead, 1900 (Hymenoptera, Braconidae, Braconinae) from India

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ABSTRACT. In the present work, *Euurobracon cephalotes cephalotes* (Smith, 1858) is recorded for the first time from India. A new state record of *Euurobracon triplagiata* (Cameron, 1900) from Madhya Pradesh is also documented. This species was previously known in the Indian states of Meghalaya, Tamil Nadu, and Uttar Pradesh. A distributional checklist of the world species of *Euurobracon* Ashmead is also provided.

Key words: new record, *Euurobracon*, checklist, distribution, India

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INTRODUCTION

Euurobracon Ashmead is a small genus of the subfamily Braconinae (Hymenoptera: Braconidae) with 15 described species worldwide, mainly occurring in the Eastern Palaearctic, Oriental region and Australasian region (Quicke, 1989; Yu et al., 2016; Li et al., 2016; Quicke et al., 2022). The members of this genus are large sized i.e. 12–20 mm in length with long ovipositor i.e. up to 19 cm, and are ectoparasitoids of cerambycid larvae (Watanabe, 1934). Quicke (1989) revised the Indo-Australian species of *Euurobracon* with description of three new species and two new subspecies, recently Li et al. (2016) worked on the Chinese species of this genus and described three new species; Quicke et al. (2022) described a new species from Indonesia. Thus far only two species of this genus are known from India i.e. *E. triplagiata* (Cameron, 1900) and *E. yokahamae* (Dalla Torre, 1898). In the present study, *E. cephalotes cephalotes* (Smith, 1858) is reported first time from India (Andaman & Nicobar Island) with diagnosis and illustrations. *E. triplagiata* (Cameron, 1900) earlier known from Meghalaya Tamil Nadu and Uttar Pradesh is reported first time from Madhya Pradesh and a checklist of all known species of *Euurobracon* based on the available literature is also provided.

MATERIAL AND METHODS

The work is based on some old specimens in the Hymenoptera section of the Zoological Survey of India, collected during the Andaman and Nicobar islands survey (1964) and the Madhya Pradesh survey (1975). The pinned specimens were observed under Leica® EZ4 binocular for identification,

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the photographs and measurements were taken by Nikon® SMZ25 stereomicroscope. Generic level identification and terminology is followed van Achterberg (1993) and Quicke (1987). All specimens are deposited in the National Zoological Collection (NZC), Kolkata. The following Abbreviations were used for the name of depositories where the type specimens are addressed. **TD** - type depository; **BMH** - Bishop Museum, Honolulu, USA; **BMNH** - British Museum (Natural History), London, UK; **HECO** - Hope Entomological Collections, Oxford, UK; **MZB** - Museum Zoologicum Bogoriense (Zoological Museum), Indonesian Institute of Sciences, Bogor, Indonesia; **NRS** - Naturhistoriska Riksmuseet, Stockholm, Sweden; **UHS** - University of Hokkaido, Sapporo, Japan; **ZJUH** - Zhejiang University, Hangzhou, China.

RESULTS

Taxonomic hierarchy

Class Insecta Linnaeus, 1758

Order Hymenoptera Linnaeus, 1758

Family Braconidae Nees, 1811

Subfamily Braconinae Nees, 1811

Genus *Euurobracon* Ashmead, 1900

Euurobracon Ashmead, 1900:140. Type species: *Bracon penetrator* Smith, 1877.

Diagnosis. [after Li et al., 2016]; Antennae 50–80 segmented most of the flagellomeres as long as wide, apical flagellomere robust, sub conical, sometimes distinctly acuminate, occasionally fused or partly fused with the penultimate flagellomere (Fig. 2F). Scapus longer dorsally than ventrally, not emarginated apico-laterally/apico-medially; mandibles large and twisted anteriorly, Clypeus without a ridge or carina, eyes glabrous, frons densely setose, with a mid-longitudinal sulcus posterior-laterally (Figs 2D, 3A). Mesosoma largely smooth and shiny, pronotum with a distinctly crenulate transverse groove anteriorly and smooth laterally; mesoscutum smooth with notauli distinct anteriorly (Fig. 2A). Scutellar sulcus completely smooth; propodeum more or less densely setose (Fig. 3E). Fore wing vein 1-SR+M weakly evenly curved medially; vein cu-a strongly post-furcal and inclivous; 3-CU1 often strongly thickened posteriorly. Hind wing vein 1r-m longer than SC+R1 (Figs 2C, 3D). Fore tibia somewhat swollen with one spur, more or less densely covered with regularly arranged small thick setae or spines antero-laterally; claws slender, simple, with the basal lobe reduced to a small basal protruding area, not especially protruding. Metasoma mostly smooth and shiny, first metasomal tergite with an anterior pit, dorso-lateral carinae absent; second metasomal tergite smooth, weakly curved medially, with a sub-lateral, longitudinal groove on either side, close to the margin (Figs 2A–B, 3E). Third metasomal tergite with or without antero-lateral area defined posteriorly by antero-lateral posteriorly diverging smooth furrows; tergites 3–5 without any transverse sub-posterior grooves. Ovipositor length variable, 0.7–14.6× the fore wing length, with a distinct dorsal nodus and ventral terminal serrations.

Euurobracon cephalotes cephalotes (Smith, 1858)

(Figs 1A, 2A–F)

Body length. 12.7–14.8 mm; forewing length= 12.15–14.9 mm; ovipositor sheath= 15.7–27.0 mm

Diagnosis. Length of head behind eye: horizontal length of eye = 0.69–0.87: 1, second metasomal tergite usually with a pair of well-developed or less obvious pits medially on either side of midline; ovipositor relatively short i.e. 1.2–1.5× of the forewing length.

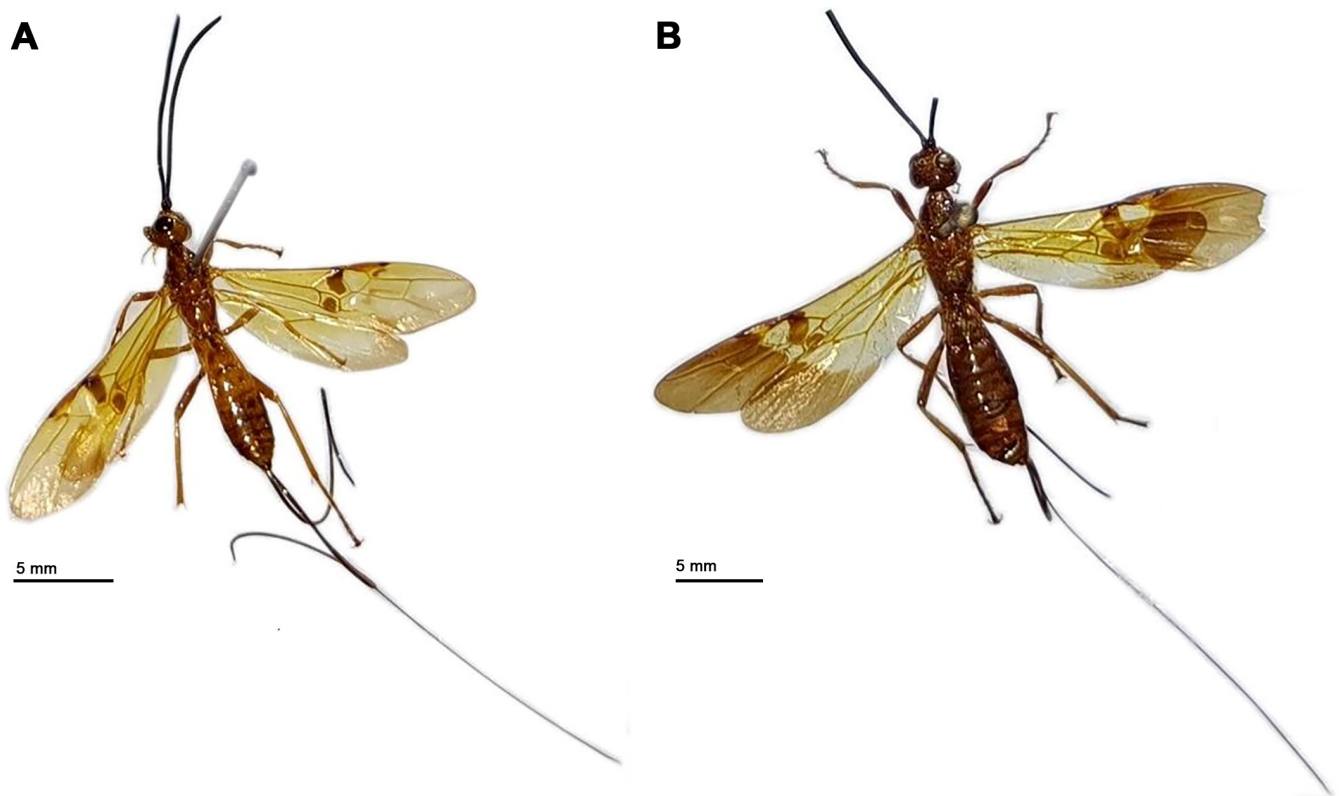


Figure 1. Habitus of two *Euurobracon* species. **A.** *Euurobracon cephalotes cephalotes* (Smith, 1858); **B.** *Euurobracon triplagiata* (Cameron, 1900).

Antennae with 55 flagellomeres, terminal flagellomere 1.4× longer than wide basally, 1st flagellomere 1.5 and 2.5× longer than 2nd and 3rd flagellomeres respectively, medial flagellar segments wider than long, scape with sparse long hairs, pedicel small ring shape (Figs 2E, 2F); Inter-tentorial distance: tentorio-ocular distance = 20:14, shortest distance between eyes: width of head = 45:87. Length of head behind eye: horizontal length of eye = 0.94:1, face with sparse and long setae dorsally just below the antennal sockets and ventrally above clypeus, some comparatively shorter setae present laterally, medial area immediately raised above clypeus and adjacent lateral depressed areas glabrous (Figs. 2D, 2E). Anterior ocellus reasonably larger than posterior ocelli, frons with a deep medial groove extending upto antennal sockets (Fig. 2E). Mesosoma smooth, shiny, 1.7× longer than high, with sparse setae on basal half and comparatively longer setae distally; mesoscutum convex, notauli smooth only impressed anteriorly; scutellum triangular and shiny; propodeum sparsely setose laterally and almost bare medially. Hind wing vein 1r-m 1.25–1.4× longer than SC+R1. Length of fore wing vein SR1:3-SR:r = 80:65:9; vein 2-SR:3-SR:r-m = (28:67:27)–(28:71:32) (Fig. 2C). Hind tibia 1.4× as long as femur, covered by stout sparse setae anteriorly and by small dense setae posteriorly, hind tarsi densely setose, basitarsus more than twice as long as telotarsus (excluding claws), penultimate hind tarsal segment 0.2× basitarsus. First metasomal tergite 1.3× longer than wide, often with a mid-longitudinal depression; second metasomal tergite 1.6× as wide as long, with less prominent grooves on either side of the midline (Figs 2A, 2B); third tergite with antero-lateral area demarcated by posteriorly diverging grooves, remainder of metasomal tergites shiny and glabrous.

Colour. Body yellowish brown, antennae and ovipositor sheath black, ovipositor yellow. Legs uniformly yellow, Wing membrane yellow, fore wing with two brownish areas; hind wing uniformly yellowish, wing venation yellow except for brown apical portion of pterostigma (Fig. 1A).



Figure 2. *Euurobracon cephalotes cephalotes* (Smith, 1858) female. **A.** Body, dorsal view; **B.** Metasomal tergite I-III, dorsal view; **C.** Wings; **D.** Head, frontal view; **E.** Head, dorsal view; **F.** Antenna.

Variations. The wings are transparent in the distal half (infusate in original description); antenna 55 segmented (vs 67), terminal flagellomere as long as wide (1.3× longer than wide); ovipositor 1.2-1.5× as long as fore wing length (1.7-2). Body length varies considerably from 12.7 to 14.82 mm.

Material Examined. 2♀♀ (regd. 26924/H3-25), INDIA, Andaman and Nicobar Island, South Andaman (Mannar Ghat), 28.iii.1964, coll. B.S. Lamba; 1♀, little Andaman, 22.i.1988, coll. A.N.T Joseph and party.

Distributions. India; Andaman & Nicobar Island (new record). Elsewhere: China (Li et al., 2016).

Euurobracon triplagiata (Cameron, 1900)

(Figs 1B, 3A–3E)

Body length. 15.1 mm; forewing length= 14.8 mm; ovipositor sheath = 20.2 mm.

Diagnosis. Hind wing vein 2-SC+R transverse; ovipositor less than 4.0× longer than the fore wing; inter-tentorial distance/tentorio-ocular distance >1.75 (Figs 3A–3C). Apical third of forewing membrane with extensive grey or grey-brown pattern, and in particular second submarginal cell with at least its posterior half marked with grey or fuscous brown (Fig. 3D). Antenna broken with only 36 intact flagellomeres, 1st flagellomere 1.5 and 1.8× longer than the 2nd and 3rd flagellomere respectively, medial flagellomeres wider than long. Inter-tentorial distance: tentorio-ocular distance = 2:1. Frons antero-laterally setose, its medio longitudinal area with longitudinal groove/ sulcus bare, face rather impressed on either side of the triangular supra-clypeal area, the central and surrounding depressed areas smooth, shiny and glabrous, dorsal area below antennal sockets with long setae. Shortest distance between eyes: width of head = 1:2. Mesosoma smooth and shiny, propodeum sparsely setose medially and densely setose laterally; Length of forewing vein SR1: 3-SR:r = 67:46:11. Forewing vein m-cu straight, 2.7× longer than 2-SR+M, Length of vein 2-SR:3-SR:r-m = 32:67:35, 3-CU1 moderately to strongly expanded posteriorly. Hind wing vein 2-SC+R and Ir-m almost as long as SC+R1. First metasomal tergite 1.1× as long as its maximum width, with a mid-longitudinal depression, and having posteriorly raised broad median area; second metasomal tergite approximately 2× wider than long, without prominent pits on either side of midline (Fig. 3E); ovipositor sheath 1.4× as long as fore wing.

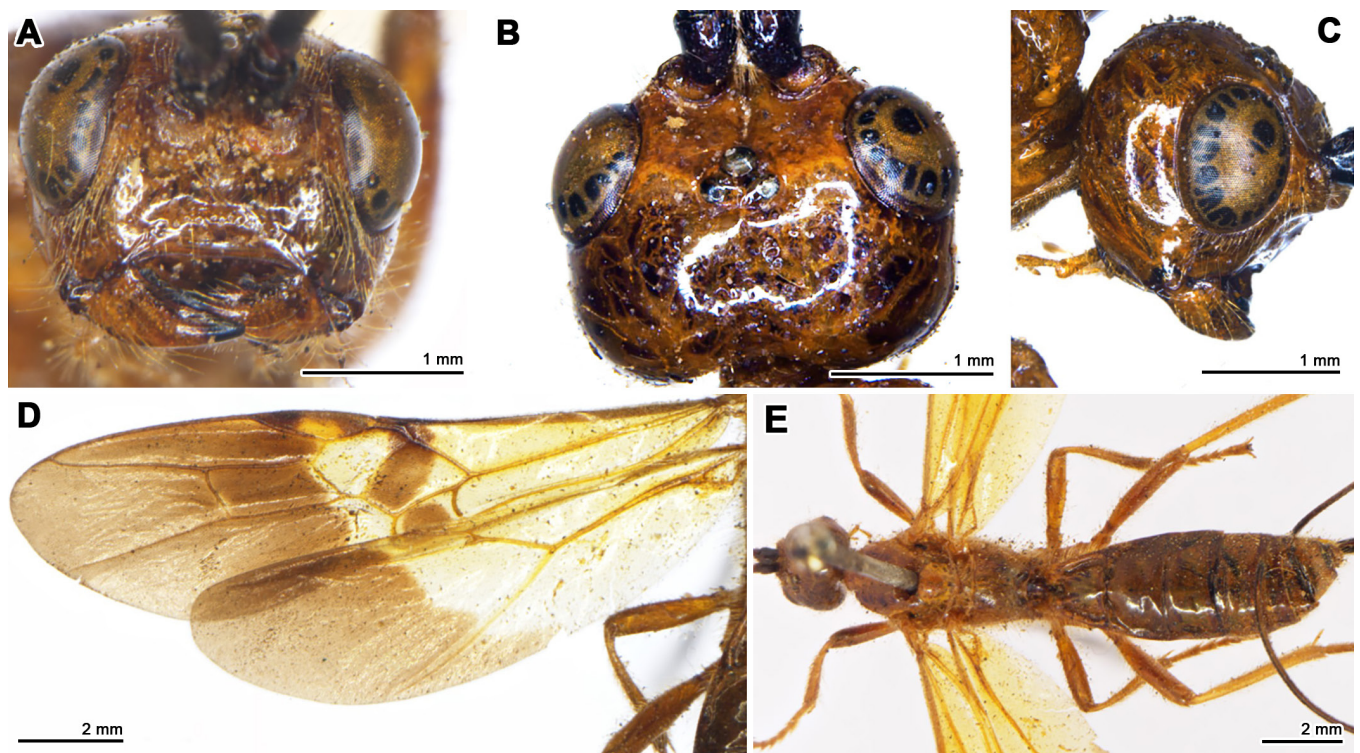


Figure 3. *Euurobracon triplagiata* (Cameron, 1900) female. **A.** Head, frontal view; **B.** Head, dorsal view; **C.** Head, lateral view; **D.** Wings; **E.** Body, dorsal view.

Colour. Antenna and ovipositor sheath black, head brownish yellow, hind leg yellow except telotarsus, which is brownish yellow. Wings yellow basally brown apically; forewing with a usually complete yellow or yellow-hyaline cross band at level of basal half of the pterostigma (Fig. 1B).

Variations. Metasomal tergite 4 with a baso-medial transverse area narrowing laterally, demarcated by a groove.

Material examined. 1♀ (regd. 26924/H3), INDIA, Madhya Pradesh, Pachmari, 28.iv.1975, coll. S.K Gupta and party.

Distribution: India (**Madhya Pradesh**, Meghalaya Tamil Nadu, Uttar Pradesh (Beeson & Chatterjee, 1935; Cameron, 1900; Chatterjee & Misra, 1974; Enderlein, 1920; Quicke, 1989). Elsewhere: China, Nepal, Sri Lanka (Li et al., 2016).

DISCUSSION

Euurobracon is comparatively a small genus of subfamily Barconinae with only 15 described species worldwide (Table 1), majority of which (11 species) are known from oriental region (India, Indonesia, Laos, Malaysia, Nepal, Philippines and Sri Lanka); six species from Palaearctic region (China, Japan & Korea) and three from Australasian region (Papua New Guinea). Many species reported by Quicke (1989) are known only from their type locality, the species number may increase and distribution may expand if the unidentified specimens in different museum/repositories are studied and fresh collection surveys are conducted across the region. The biology and behaviour of majority of the *Euurobracon* species is unknown, and efforts are need to work it out.

Table 1. Worldwide checklist of the *Euurobracon* species.

Species	TD	Distribution
1. <i>Euurobracon acuminatus</i> Li, He & Chen, 2016	ZJUH	China (Li et al., 2016)
2. <i>Euurobracon apicalis</i> Roman, 1913	NRS	Philippines (Quicke, 1989)
3. <i>Euurobracon bhaskarai</i> Quicke, 2022	MZB	Indonesia (Quicke et al., 2022)
4. <i>Euurobracon breviterebrae</i> Watanabe, 1934	UHS	China & Japan (Wanatabe, 1934; You et al. 1994; Quicke, 1989; He et al., 2004; Kittel et al., 2019)
5. <i>Euurobracon cephalotes</i> (Smith, 1858)	HECO	Indonesia, Laos, & Malaysia (Quicke, 1989, 2022), India (new record)
6. <i>Euurobracon denticephalus</i> Quicke, 1989	BMNH	Indonesia, Malaysia & Papua New Guinea (Quicke, 1989)
7. <i>Euurobracon disparalis</i> Li, He & Chen, 2016	ZJUH	China (Li et al., 2016)
8. <i>Euurobracon forticornis</i> (Cameron, 1905)	BMNH	Indonesia & Malaysia (Quicke, 1989)
9. <i>Euurobracon impossibilis</i> (Dalla Torre, 1898)	HECO	Indonesia & Papua New Guinea (Quicke et al., 2022)
10. <i>Euurobracon interstitialis</i> Quicke, 1989	BMNH	Malaysia (Quicke, 1989)
11. <i>Euurobracon laetus</i> Roman, 1913	NRS	Philippines (Quicke, 1989)
12. <i>Euurobracon latitempus</i> Quicke, 1989	BMH	Papua New Guinea (Quicke, 1989)
13. <i>Euurobracon triplagiata</i> (Cameron, 1900)	HECO	China & India - Madhya Pradesh , Meghalaya Tamil Nadu, Uttar Pradesh (Ramakrishna Ayyar, 1924; Beeson & Chatterjee, 1935; Cameron, 1900; Chatterjee & Misra, 1974; Enderlein, 1920; Quicke, 1989), Nepal & Sri Lanka (Li et al., 2016).
14. <i>Euurobracon xuthus</i> Li, He & Chen, 2016	ZJUH	China
15. <i>Euurobracon yokahamae</i> (Dalla Torre, 1898)	HECO	India - Meghalaya, Sikkim, West Bengal (Cameron, 1910a, 1910b, Quicke, 1989), China, Japan, Korea, Laos & Thailand (Li et al., 2016; Kittel et al., 2019).

AUTHOR'S CONTRIBUTION

The authors confirm their contribution in the paper as follows: I. Ahamed.: Identified the specimens and prepared the manuscript; S.I. Kazmi: Confirm the identifications and did the proofreading. All authors read and approved the final version of the manuscript.

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AVAILABILITY OF DATA AND MATERIAL

Not applicable.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

CONSENT FOR PUBLICATION

Not applicable.

CONFLICT OF INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this paper.

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یافته‌های جدید از جنس *Euurobracon* Ashmead, 1900 (Hymenoptera, Braconidae, Braconinae) از هند

اشتیاق احمد* و سرفرازالاسلام کاظمی

بخش مطالعات جانورشناسی هند، بنگال غربی، هند

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چکیده: در این مطالعه، گونه *Euurobracon cephalotes cephalotes* (Smith, 1858) برای اولین بار از هندوستان گزارش شد. همچنین حضور گونه *Euurobracon triplagiata* (Cameron, 1900) برای اولین بار از ایالت مادھیا پرادش ثبت گردید. این گونه پیش از این در ایالات مگالایا، تامیل ناد و اوتارپرادش گزارش شده بود. فهرست و پراکنش گونه‌های جنس *Euurobracon* Ashmead از سراسر جهان نیز آرایه شد.

واژگان کلیدی: گزارش جدید، فهرست گونه‌ها، پراکنش، هندوستان، *Euurobracon*