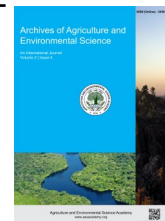




e-ISSN: 2456-6632

This content is available online at AESA
Archives of Agriculture and Environmental Science
Journal homepage: www.aesacademy.org



SHORT COMMUNICATION



Key to Indian species of genus *Brachygrammatella* Girault (Hymenoptera: Trichogrammatidae) with re-description of *B. indica* and some new distributional records

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ARTICLE HISTORY

Received: 19 February 019
Revised received: 25 February 2019
Accepted: 03 March 2019

Keywords

Brachygrammatella
Indian species
Re-description records
Trichogrammatidae

ABSTRACT

The aim of the study was to re-describe the egg parasitoid *Brachygrammatella indica* Viggiani and Hayat with some additional morphometric characters, especially of the genitalic component with SEM photography, they are mostly attacked on eggs of hemipterous insect pests and they keep their population under check and balance. During present research, materials were collected from the forestry and adjoining agro-forestry areas of Bihar, Haryana, Punjab, Uttarakhand and Uttar Pradesh by sweeping with net and parasitized eggs collection. In this paper *Brachygrammatella indica* Viggiani & Hayat is re-described with some new distributional records and key to Indian species of genus *Brachygrammatella* Girault also updated.

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Citation of this article: Yousuf, M., Ikram, M. and Rajwar, N. (2019). Key to Indian species of genus *Brachygrammatella* Girault (Hymenoptera: Trichogrammatidae) with re-description of *B. indica* and some new distributional records. *Archives of Agriculture and Environmental Science*, 4(1): 109-112, <https://dx.doi.org/10.26832/24566632.2019.0401017>

INTRODUCTION

Species of genus *Brachygrammatella* Girault are important egg parasitoids of hemipterous insect pest and they keep the population of insect pests under check and balance (Lotfalizadeh et al., 2016; Moravvej et al., 2016). It is represented by 9 species worldwide: *B. coniclavata* (Lin, 1993); *B. hilli* (Viggiani, 1968); *B. indica* (Viggiani and Hayat, 1974); *B. jaipurensis* (Yousuf and Shafee, 1988); *B. nebulosi* (Girault, 1915); *B. perplexa* (Girault, 1915); *B. salutaris* (Doutt, 1969); *B. speciosissima* (Girault, 1912) and *B. ventralis* (Doutt, 1969) of which two species, *B. indica* Viggiani & Hayat and *B. jaipurensis* Yousuf and Shafee are recorded from India. Hayat (2008) synonymized *B. aligarhensis* Khan, *B. longiclavata* Khan and *B. indica* Khan with *B. indica* Viggiani & Hayat. In this paper *Brachygrammatella indica* Viggiani & Hayat (both ♂ & ♀) re-described with some additional characters. Key to Indian species of genus *Brachygrammatella* Girault is also updated with some new distributional records (Yousuf et al., 2015).

This short communication focused for lighting the keys to Indian species of genus *Brachygrammatella* Girault (Hymenoptera:

Trichogrammatidae) with re-description of *B. indica* and evaluation of some new distributional records.

MATERIALS AND METHODS

Study design and sample processing

The materials were collected from the forestry and adjoining agro-forestry areas of Bihar, Haryana, Punjab, Uttarakhand and Uttar Pradesh. Two methods were used during collection, sweeping and parasitized eggs collection. Sorted out specimens from collected samples and emerged parasitoids from eggs were preserved in 70% alcohol. Following the normal process of dehydration, specimens were dissected in clove oil under stereoscopic microscope for studying the important taxonomic characters; dissected body parts were kept in a drop of euparal on slides and covered with coverslips.

Apparatus and instruments

Only body lengths of specimens were measured in millimeters, all other measurements were taken from the divisions of a linear scale micrometer placed in the eye piece of a Nikon

Digital Sight attached with Optiphot Microscope, at 10×, 20× and 40× for slide-mounted parts. Scales were placed on photographs of slide mounted parts and measurements were taken with the help of NIS-ELEMENT software in micrometer (μm). Photographs of slide-mounted specimens were taken with digital camera “Nikon Digital Sight attached with Optiphot Microscope (Japan)” fitted over a compound microscope (Leica’s Leitz Labor Lux S). For scanning electron microscopy (SEM), the specimens were dehydrated in ascending grades of ethanol and then subjected to critical point drying. These were then glued on stubs with double sided sticky tape and gold coated. The Scanning electron micrographs were taken by JSM. 6510LV-JOEL (Japan).

The following abbreviations are used: OOL = Ocello-ocellar length; POL= Post-ocellar length; C1 & C2= Club segments 1 & 2; STV= Stigmal vein; MV= Marginal vein; PM= Pre marginal vein.

RESULTS AND DISCUSSION

Key to Indian species of *Brachygrammatella* Girault based on females

B. indica Viggiani & Hayat

Antennae with club about 2× as long as wide, pedicel less than 1.5× as long as wide, two anelli present, scape less than 3× as long as wide; marginal fringe absent (Figures 1-3).

B. jaipurensis Yousuf & Shafee

Antennae with club less than 2× as long as wide, pedicel more than 1.5× as long as wide, single anellus, scape slightly more than 3× as long as wide; marginal fringe very short, less than 1/10th of wing width.

Brachygrammatella indica Viggiani & Hayat

Brachygrammatella (*Pseudbrachygramma*) *indica* Viggiani & Hayat, 1974: 150. *Brachygrammatella indica* Khan, 1975a: 431. Synonymized by Hayat, 2008: 3.

Brachygrammatella aligarhensis Khan, 1976: 392. Synonymized by Hayat, 2008: 3.

Brachygrammatella longiclavata Khan, 1975b: 635. Synonymized by Hayat, 2008: 3.

Re-description

Female

Length 0.65 mm (Figure 1A). Head with fronto-vertex pale yellow; eyes and ocelli red; Mandibles golden yellow with tip brown. Antennae with scape and pedicel yellow except club brown in colour. Midlobe of mesoscutum yellow except dorsellum and propodeum parts with light bright yellow. Fore and hind wings hyaline except light infuscation beneath venation.

Head

(facial view) (Figure 3A) 1.12× as broad as long (260: 232). Ocelli

arranged in equilateral triangle, OOL 2.8× as long as POL; eyes 3× as long as malar space; mandibles with tri-denticles (Figure 1D). Antennae (Figure 1B) with scape 2.84× as long as broad (74: 26); pedicel 1.32× as long as broad (45: 34); two anelli present; funicle about 2× wider than long; club two-segmented (C1 and C2), about 2× as long as broad (87: 41).

Mesosoma

(Figure 1E) Midlobe of mesoscutum about 1.36× wider than long (167: 123) with 2 pairs of short setae present on dorsal surface; midlobe of scutellum 1.61× wider than long (150: 93) with 2 pairs of setae, dorsellum 0.53× as long as propodeum (16: 30). Fore wings (Figure 1F) with dens setae, about 2× as long as broad (559: 263), marginal fringe absent, MV broad with numerous stae, almost as long as PM, STV rudimentary.

Metasoma

(Figures 1E and 3D) Gaster longer than mesosoma; ovipositor short (Figure 2A), not extending upto apex of genitalia, about 0.90× as long as hind tibia.

Male

Similar to the female. Antenna (Figure 1C) with scape about 4× as long as wide (78: 20), pedicel 1.33× as long as wide (44: 33), 2 anelli, funicles (F1 & F2) 1.6× wider than long; club 2 segmented, 1.7× as long as wide.

Genitalia

(Figures 2B and 3E) Tubular in shape; about 0.70× shorter than hind tibia (115:165).

Examinations in the Indian states

Haryana

Panchkula, 6♀ & 4♂, 15.ix.2015, R. B. Singh, by sweeping; Mahendragarh, Faizabad, 1♀, 14.vii.2018; Kukshi, 1♂; Jhajjar, Babarpur, 1♀, 17.vii.2018; Chandol, 1♀; Dawla, 1♀; ex. eggs of *Oxyraxis tarandus* (Fabricius) on *Prosopis juliflora*. Faridabad, Pali Village, 1♀, 29.v.2018, S. Khan, by sweeping; Nuh, Ghasera, 1♀, M. Ikram, ex. eggs of *Oxyraxis tarandus* (Fabricius) on *Acacia* sp.

Bihar

Kaimur, Passoiya, 1♀, 18.vi.2018; Pateri, 1♀, M. Ikram; Pusauli, 1♀, M. Ikram, by sweeping.

Punjab

Taran Tarn, Muradnagar, 1♀, 11.ix.2013; M. Yousuf, by sweeping.

Uttar Pradesh

Mirzapur, Bokaria, 1♀, 18.vi.2018; Saharanpur, Biharigarh, 21.viii.2018, 2♀; Jhansi, Simra, 02.ix.2018; 1♂ & 2♀; Jhansi, Lokar, 1♀; A.K. Mishra, by sweeping; Varanasi, Parjanpur, 1♀, 19.vi.2018; Bithalpur, 1♀, 19.vi.2018; Gopipur, 1♀; Manorathpur, 1♀, M. Ikram, by sweeping.

Acacia sp.

Uttarakhand

Dehradun, New Forest, 1♀, 23.vii.2018, M. Ikram, by sweeping;
1♀, 31.vii.2018; M. Ikram. Ex. Eggs of *Oxyrachis tarandus*
(Fabricius) on *Prosopis juliflora* and *Acacia nilotica*.

Habit and habitats

Host

Eggs of *Oxyrachis tarandus* (Fabricius) on *Prosopis juliflora* and

Distribution

INDIA: Maharashtra, Punjab, Tamilnadu, Uttar Pradesh, (Khan
1975a & b).

Present records

Punjab (Tarn taran); Uttarakhand (Dehradun); Uttar Pradesh
(Saharanpur, Jhansi, Varanasi); Haryana (Panchkula,
Mahendragarh, Jhajjar, Faridabad, Nuh).

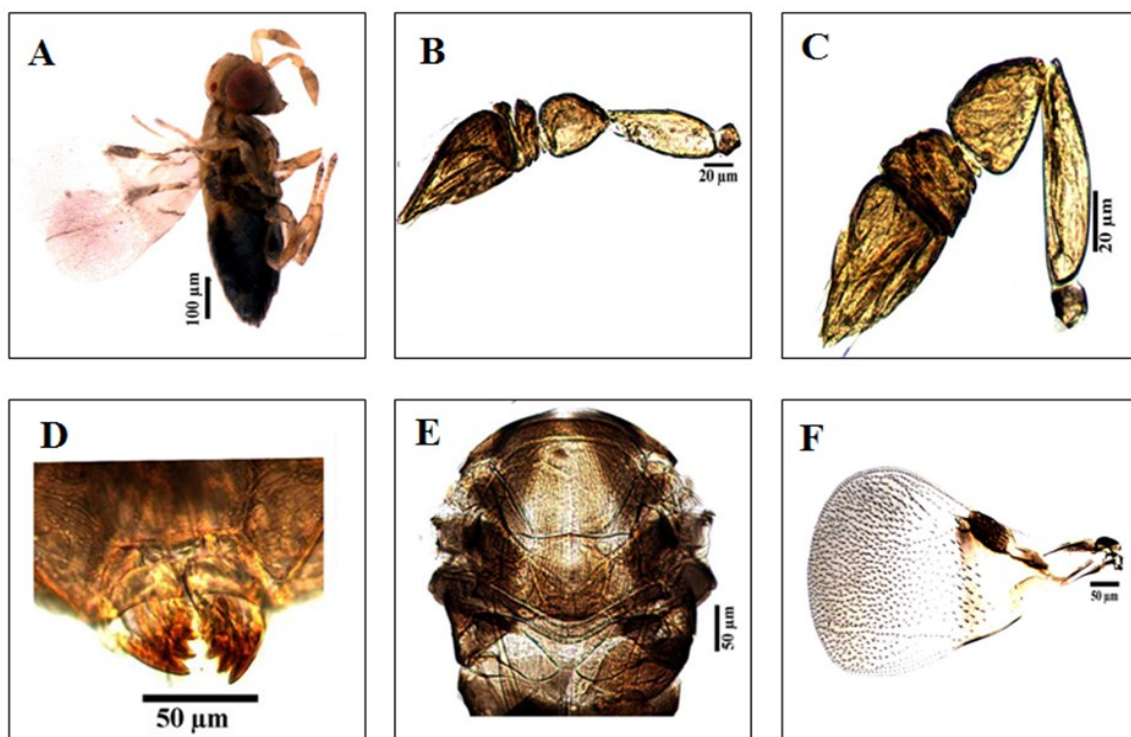


Figure 1. *Brachygrammatella indica* Viggiani & Hayat. (A) adult ♀; (B) antenna ♀; (C) antenna ♂; (D) mandibles ♀; (E) mesosoma ♀ and (F) forewing ♀.

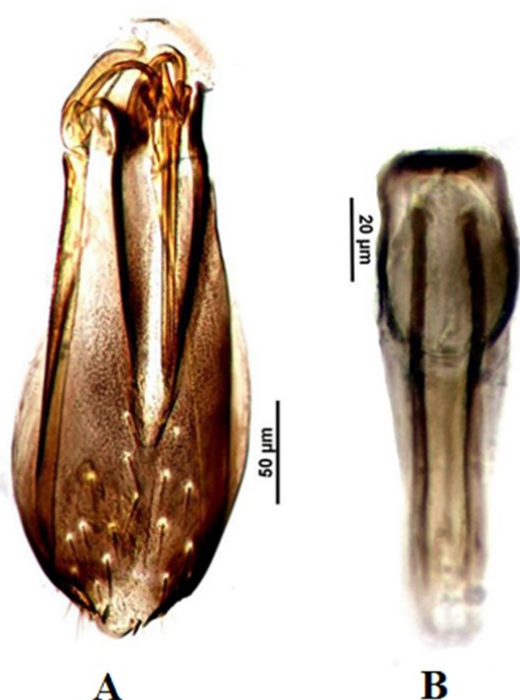


Figure 2. *Brachygrammatella indica* Viggiani & Hayat. (A) Genitalia ♀ and (B) Genitalia ♂.

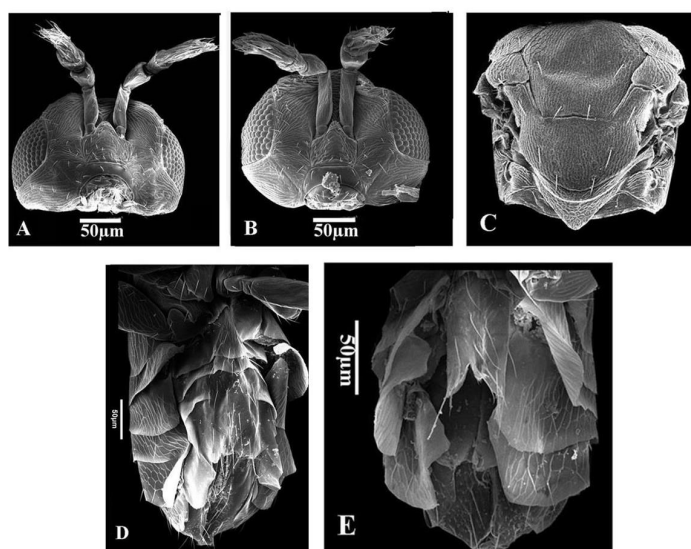


Figure 3. *Brachygrammatella indica* Viggiani & Hayat. (A) head and antenna ♀; (B) head and antenna ♂; (C) mesosoma ♀; (D) metasoma ♀ and (E) metasoma ♂.

Conclusion

Brachygrammatella indica was described by Viggiani & Hayat, based on female, later (Hayat, 2008) synonymized *B. aligarhensis* Khan, *B. longiclavata* Khan and *B. indica* Khan with *B. indica* Viggiani & Hayat. Earlier worker described it poorly, so authors have re-described with some additional morphometric characters and provided SEM (Scanning electron micrograph) images, which will be helpful for further identification.

ACKNOWLEDGEMENT

The authors are greatly indebted to the Director, Forest Research Institute, Dehradun for providing necessary research facilities.

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