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## Three new records of the genus *Helionothrips* (Insecta: Thysanoptera: Thripidae) from India

Thang Johnson<sup>1,\*</sup>, Maisnam Shyam<sup>1</sup>, Rajan Ramani Rachana<sup>2</sup>, Ramaiyer Varatharajan<sup>1</sup>, Heishnam Taptamani<sup>1</sup> and Majid Mirab-balou<sup>3</sup>

<sup>1</sup> Centre of Advanced Study in Life Sciences, Manipur University, Canchipur, Manipur, India – 795 003.

<sup>2</sup> Indian Council of Agricultural Research – National Bureau of Agricultural Insect Resources (ICAR – NBAIR), Bengaluru – 560 024.

<sup>3</sup> Department of Plant Protection, College of Agriculture, Ilam University, 69315 – 516, Ilam, Iran.

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**ABSTRACT.** Three species of the genus *Helionothrips* Bagnall, namely *Helionothrips cephalicus* Hood, *H. mube* Kudo and *H. unitatus* Chen were collected and identified for the first time from India. Geographical distribution and diagnostic characters for the newly recorded species and a key to identify all the species of *Helionothrips* recorded so far from India is also provided.

**Key words:** Thrips, *Helionothrips*, new record, north-eastern India, Manipur

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### Introduction

The genus *Helionothrips* Bagnall is the largest among the 40 extant genera recognized in the subfamily Panchaethripinae with a total of 28 species (Thripwiki, 2019). All these species are confined to the Asian region with the exception of three species from Africa and one each from Australia and South America (Mound & Marullo, 1996). A perusal of the literature indicated that only five species *Helionothrips aino* (Ishida), *Helionothrips kadaliphilus* (Rama-krishna & Margabandhu), *Helionothrips nilgircus* (Ananthakrishnan), *Helionothrips parous* Bhatti and *Helionothrips shivalik* Bhatti have so far been recorded from India (Rachana & Varatharajan, 2017). Members of *Helionothrips* can be easily recognized

with a distinct tergal sculpture forming a series of arches on the antecostal ridges of each abdominal segment, head with a collar-like transverse ridge dorsally and forked sense cones on antennal segments III & IV. This genus is closely related to *Hercinothrips* Bagnall, but differs in having 1-segmented tarsi, a reticulated triangle medially on the metanotum, and the anterior vein of fore wing with a few scattered setae (Mound et al., 2001).

This paper aims at reporting *Helionothrips cephalicus*, *H. mube* and *H. unitatus* as three new records for India. Key to identify eight species of *Helionothrips* recorded so far from India has also been provided.

Corresponding authors: Thang Johnson, E-mail: [thangjohnson@gmail.com](mailto:thangjohnson@gmail.com)

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## Material and methods

### Study sites

Periodical surveys were undertaken in different parts of north-eastern (NE) India (22° N and 29°5' N latitude and 88° E and 97°30' E longitude) during 2011-2018 and the specific collection sites include the Itanagar Wildlife Sanctuary (IWS, Arunachal Pradesh), Kaziranga National Park (KNP, Assam), Keibul Lamjao National Park (KLNP, Manipur), Dampa Tiger Reserve (DTR, Mizoram) and Mokukchung (Mok, Nagaland).

### Collection of insects

Thrips were collected at random from their plant hosts using the conventional method of picking up the specimens from the beating tray with the help of a small brush and temporarily preserving them in a collection fluid [10% Ethanol (90ml) + Glacial Acetic acid (10 ml) + Triton-X (0.1 ml)] for further processing at the laboratory (Bhatti, 1997).

### Permanent slide preparation and identification

Permanent slides were made following the protocol given at ThripsWiki (2019) and the identities of thrips were established based on the key provided by Wilson (1975), Wang (2016) and Mirab-balou et al. (2017). The examined specimens are deposited in the National Repository, ICAR-NBAIR, Bengaluru, and also in the Insect Museum of Manipur University, India.

## Results

### *Helionothrips cephalicus* Hood

(Figs 1A-1E)

**Materials studied:** 4♀♀, INDIA, Nagaland, Impur on leaves of *Cyrtococcum* sp. (Poaceae), 29.I.2012 (O. Tarunkumar) (MU/LSD/PanThrips-77) in Insect Museum, Manipur University; 1♀, INDIA, Manipur, Sagolband Bijoy Govinda, Nambul river bank on leaves of *Phragmites karka* (Retz.)

Trin. Ex Steud. (Poaceae), 03.V.2013 (K. Bala) (MU/LSD/PanThrips-81) in Insect Museum, Manipur University.

**Diagnosis:** Antennae VIII-segmented; segments I & II brown, II prominently darker than VI; III-V and basal half of VI yellow, apical half of VI, VII & VIII light brown; forked sense cones on III & IV, that on IV reaching mid of segment V (Fig. 1A). Head, thorax, metascutal triangle and lateral of abdominal tergites II-VIII with wrinkles in reticles (Figs 1B, 1C). All tarsi yellow; fore tibia yellow, brown on the laterals; mid and hind tibiae brown, yellow at base and apex. Fore wings entirely brown except for a pale patch at subbasal and subapical regions (Fig. 1D). Abdominal tergite I polygonally reticulate with intermittent gap (Fig. 1E). Abdominal tergite VIII with interrupted comb medially; abdominal segment IX twice as long as segment X.

**Geographical Distribution:** This species was described from Taiwan on grass and has also been recorded from mainland China, Japan, Malaysia and Nepal (Kudo, 1995; Mirab-balou et al., 2017; Wang, 2016). New record for India (current study).

### *Helionothrips mube* Kudo

(Figs 1F-1H, 2A-2B)

**Materials studied:** 4♀♀ & 1♂, INDIA, Nagaland, Mokokchung on leaves of *Cyrtococcum* sp. (Poaceae), 21.IV.2013 (M. Shyam) (MU/LSD/PanThrips-324) in Insect Museum, Manipur University; 3♀♀, INDIA, Mizoram, Dampa Tiger Reserve on leaves of *Alocasia* sp. (Araceae), 23.X.2014 (Th. Johnson) (MU/LSD/PanThrips-440) in Insect Museum, Manipur University.

**Diagnosis:** Antennae VIII segmented; segments I-V & base of VI yellow, rest of VI & VII brown, VIII light brown; forked sense cones on III & IV, which on IV reaching apex of segment VI (Fig. 1F). Body dark brown. Head, thorax and metascutal

triangle reticulated and without wrinkles; lateral of abdominal tergites II-VIII with wrinkles in reticles. All tarsi yellow; fore tibia yellow, brown on the laterals; mid and hind tibiae brown, yellow at base and apex. Fore wing proximal half brown, base darker; followed by a transparent band, apical half light brown (Fig. 1G). Abdominal tergite I polygonally reticulate with intermittent gap (Fig. 1H). Abdominal tergite VIII with interrupted comb medially. Male similar to female. Tergite IX with 2 pairs of stout setae, anterior pair stouter and farther apart followed by a cluster of 9 wart-like tubercles (Fig. 2A). Sternites VI, VII and VIII with an anteromedian small, round glandular area (Fig. 2B).

**Geographical Distribution:** This species has been recorded earlier from China (including Taiwan) and Japan (Mirab-balou et al., 2017; Wang, 2016). New record for India (current study).

#### *Helionothrips unitatus* Chen

(Figs 2C–2G)

**Materials studied:** 4♀♀, INDIA, Manipur, Phayeng on leaves of *Musa* sp. (Musaceae), 21.IV.2011 (K. Bala) (MU/LSD/PanThrips-104) in the Insect Museum, Manipur University; 4♀♀, INDIA, Mizoram, Dampa Tiger Reserve on leaves of *Musa* sp. (Musaceae), 22.V.2017 (Th. Johnson) (MU/LSD/PanThrips-130) in Insect Museum, Manipur University.

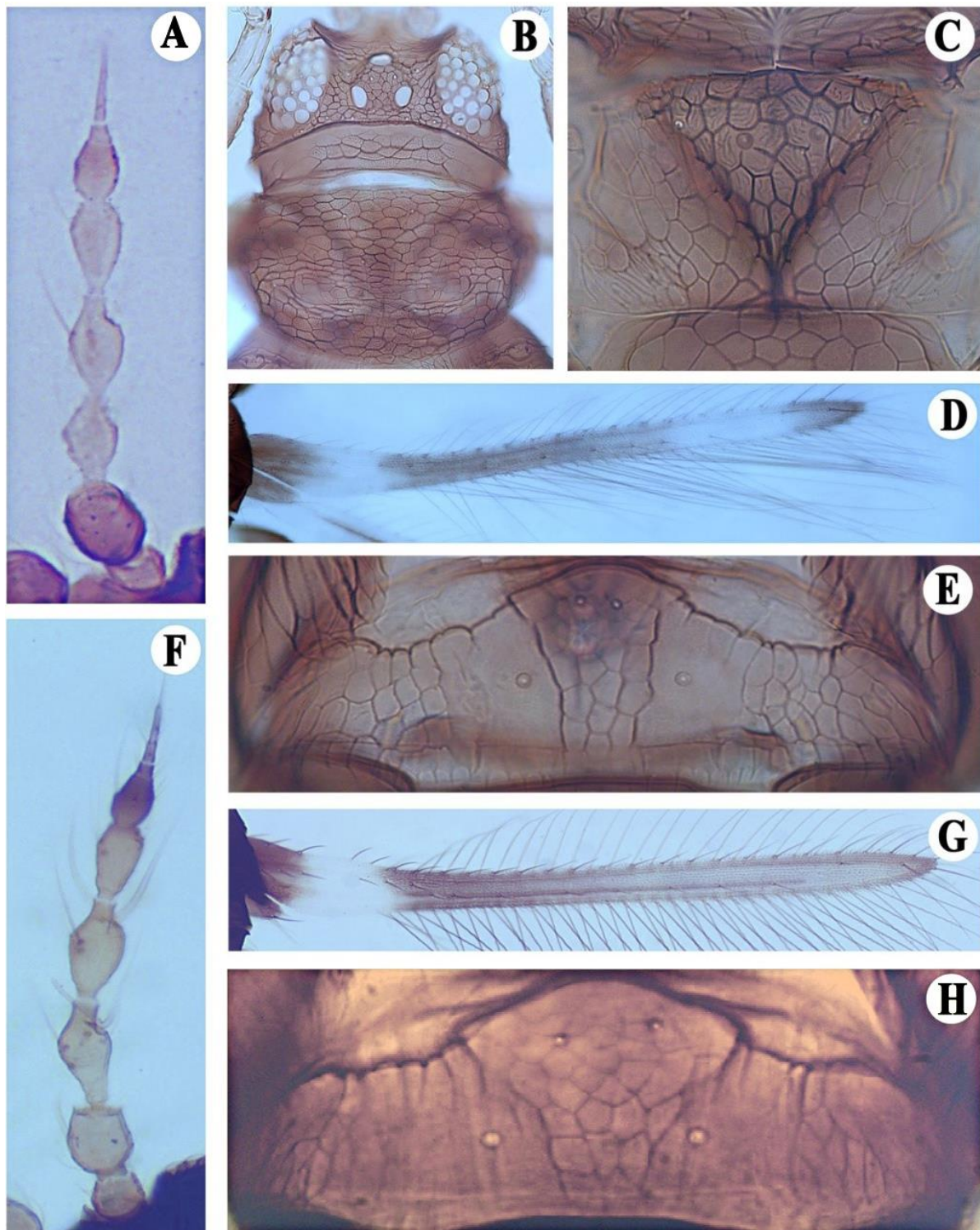
**Diagnosis:** Head, thorax and metascutal triangle reticulated and without wrinkles; lateral of abdominal tergites II-VIII with wrinkles in reticles (Figs 2C, 2D). Antennae VIII segmented; segments I, II, VI, VII & base of VIII brown, rest pale yellow; forked sense cones on III & IV, that on IV reaching apex of segment VI (Fig. 2E). All tarsi yellow; fore tibia yellow, brown on the laterals; mid and hind tibiae brown, apical 1/3rd yellow. Abdominal tergite I polygonally reticulate with intermittent gap (Fig. 2F). Fore wing proximal half

brown, base dark brown, followed by a transparent band, apical half light brown with apical tip brown (Fig. 2G). Abdominal tergite VIII with interrupted comb medially.

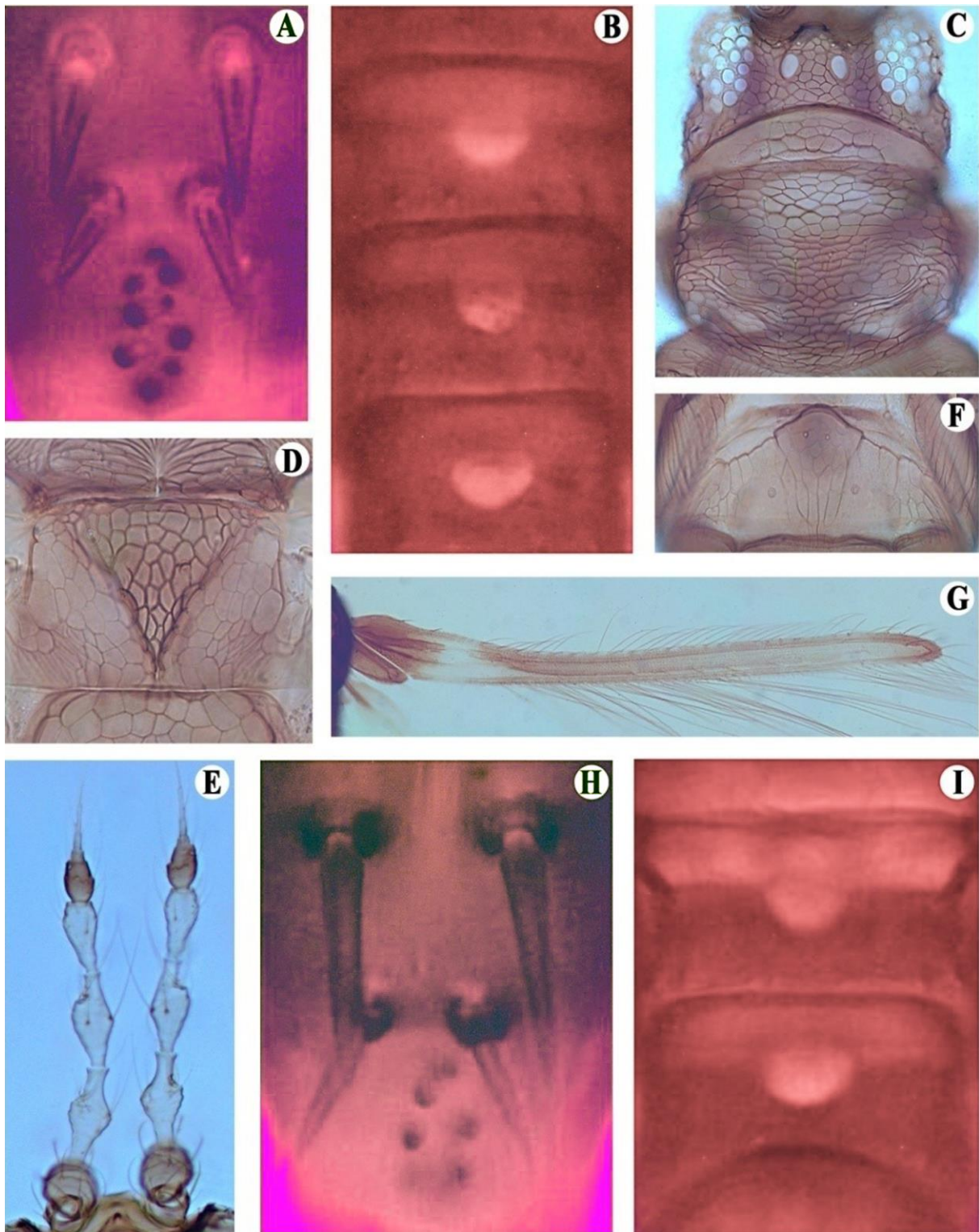
**Geographical distribution:** This species has been described from Taiwan (Wang, 2016), and recently also recorded from China (Mirab-balou et al., 2017). New record for India (current study).

#### Key to species of the genus *Helionothrips* from India

1. Antecostal line on abdominal tergites III – VIII issuing caudad, forming three broad contiguous scallops. .... *nilgricus*
- . Antecostal line on abdominal tergites III – VIII transverse, not issuing caudad. .... 2
2. Antennal segment II yellow. .... 3
- . Antennal segment II brown. .... 7
3. Sense cone on antennal segment IV long, reaching atleast upto mid of VI. .... 4
- . Sense cone on IV short, never beyond apex of V. .... 6
4. Males with pore glands on sternites. .... 5
- . Males without pore glands on sternites. .... *unitatus*
5. Small circular pore gland on sternites VII & VIII; stout setae on tergite IX closely placed (Figs 2H, 2I). .... *aino*
- . Small circular pore gland on sternites VI–VIII; stout setae on tergite IX comparatively farther placed (Figs 2A, 2B). .... *mube*
6. Reticulations on occipital collar with wrinkles in the form of numerous dots. .... *shivalik*
- . Reticulations on occipital collar without wrinkles. .... *kadaliphilus*
7. Antennal segment II concolorous with VI; male pore glands on sternites VII & VIII. .... *parous*
- . Antennal segment II prominently darker than VI; male pore glands on sternite VIII only. .... *cephalicus*



**Figure 1.** *Helionothrips cephalicus* Hood, **A.** Antenna; **B.** Head & pronotum; **C.** Metascutal triangle; **D.** Fore wing; **E.** Tergite I; *Helionothrips mube* Kudo, **F.** Antenna; **G.** Fore wing; **H.** Tergite I.



**Figure 2.** *Helionothrips mube* Kudo, **A.** Tergite IX of male; **B.** Male glandular areas on sternites VI-VIII; *Helionothrips unitatus* Chen, **C.** Head & pronotum; **D.** Metascutal triangle; **E.** Antenna; **F.** Tergite I; **G.** Fore wing; **H.** Tergite IX of male; **I.** Male glandular areas on sternites VII & VIII.

## Discussion

With the collection of *Helionothrips cephalicus*, *H. mube*, and *H. unitatus* from NE India, it becomes increasingly evident that the thysanopteran fauna of this part of India appears to show similarity with that of south east Asia in general and southern China in particular. Similar observation has been reported by Wang et al. (2019) while discussing with the genus *Dendrothrips* in China. This view gains significance in the present context because all the three new record of thrips reported here also occur in China in addition to *H. aino* and *H. parvus*. A perusal of the literature indicated that the fauna similarity between China and India was to the extent of 30% based on the comparison of species reported from both the countries (Mirab-balou et al., 2011; Tyagi & Kumar, 2016; Rachana & Varatharajan, 2017). The north-eastern states of India is a mid-sector between the Indian, Indo-Malayan, Indo-Chinese biogeographic regions (Chakravarty et al., 2012). Due to its unique topographical positioning, NE India appears to serve as a central point for the above mentioned regions thereby facilitating both the countries to share certain common species.

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## Conflict of Interests

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

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## سه گزارش جدید از جنس *Helionothrips* (Insecta: Thysanoptera: Thripidae) از هند

هانگ جانسون<sup>۱\*</sup>، مایسنام شیام<sup>۱</sup>، رایان رامانی راجانا<sup>۲</sup>، رامایر واراثاراجان<sup>۱</sup>، هیشنم تاپ تامانی<sup>۱</sup> و مجید میراب بالو<sup>۳</sup>

۱ مرکز مطالعات پیشرفته علوم زیستی، دانشگاه مانی پور، کانچی پور، مانی پور، هند.

۲ انجمن تحقیقات کشاورزی هند، دفتر ملی اطلاعات حشره‌شناسی کشاورزی، بنگلور، هند.

۳ گروه گیاهپزشکی، دانشکده کشاورزی، دانشگاه ایلام، ایلام، ایران.

\* پست الکترونیکی نویسنده مسئول مکاتبه: [thangjohnson@gmail.com](mailto:thangjohnson@gmail.com)

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**چکیده:** سه گونه از جنس *Helionothrips* Bagnall به نام‌های *Helionothrips* *cephalicus* Hood و *H. mube* Kudo و *H. unitatus* Chen برای اولین بار از هند جمع‌آوری و شناسایی گردید. توزیع جغرافیایی و ویژگی‌های ریخت‌شناسی برای گزارش‌های جدید و کلید شناسایی برای همه گونه‌های جنس *Helionothrips* که تاکنون از هند گزارش شده‌اند ارائه شد.

**واژگان کلیدی:** تریپس، *Helionothrips*، گزارش جدید، شمال شرقی هند، مانی پور