



## New records of the family Thripidae (Thysanoptera, Terebrantia) from India

### Abhishek Patidar

Department of Zoology, University of Calcutta, Kolkata, West Bengal, India [1]; Centre for DNA Taxonomy, Molecular Systematics Division, Zoological Survey of India, West Bengal, India.

✉ [abhipatidar.7a@gmail.com](mailto:abhipatidar.7a@gmail.com)

<https://orcid.org/0000-0003-2089-8308>

### Shash Pal

Department of Zoology, University of Jammu, Jammu & Kashmir, India.

✉ [palthakur252@gmail.com](mailto:palthakur252@gmail.com)

<https://orcid.org/0000-0002-9993-3243>

### Madhurima Sarma

Department of Zoology, University of Calcutta, Kolkata, West Bengal, India [1]; Centre for DNA Taxonomy, Molecular Systematics Division, Zoological Survey of India, West Bengal, India.

✉ [madhusarma97@gmail.com](mailto:madhusarma97@gmail.com)

<https://orcid.org/0000-0002-0171-174X>

### Vikas Kumar

Centre for DNA Taxonomy, Molecular Systematics Division, Zoological Survey of India, West Bengal, India.

✉ [vikaszi77@gmail.com](mailto:vikaszi77@gmail.com)

<https://orcid.org/0000-0002-0215-0120>

### Kaomud Tyagi

Centre for DNA Taxonomy, Molecular Systematics Division, Zoological Survey of India, West Bengal, India.

✉ [kumud.tyagi5@gmail.com](mailto:kumud.tyagi5@gmail.com)

<https://orcid.org/0000-0003-1064-9826>

**Received:**  
18 July 2023

**Accepted:**  
11 August 2023

**Published:**  
15 August, 2023

**Subject Editor:**  
Jalil Alavi

**ABSTRACT.** Two species of family Thripidae, *Hydatothrips onari* Kudô, 1997 from subfamily Sericothripinae and *Thrips alius* Palmer, 1992 from subfamily Thripinae are collected on *Guizotia abyssinica* and general vegetation respectively for the first time from India after their original description. Due to the addition of these two species in the Indian fauna, the number of species increased under the genus *Hydatothrips* from 10 to 11 and under the genus *Thrips* from 44 to 45. Species diagnosis with illustrations and distribution of the newly recorded taxa is also provided.

**Key words:** *Hydatothrips*, new record, Sericothripinae, Thripinae, *Thrips*

**Citation:** Patidar, A., Pal, S., Sarma, M., Kumar, V. & Tyagi, K. (2023) New Records of the family Thripidae (Thysanoptera, Terebrantia) from India. *Journal of Insect Biodiversity and Systematics*, 9 (4), 695–702.

## INTRODUCTION

Thripidae is one of the largest family of the order Thysanoptera and is known by 2,207 species across the globe (ThripsWiki, 2023). The family Thripidae is further classified into 4 subfamilies: Dendrothripinae, Panchaethripinae, Sericothripinae, and Thripinae (Bhatti, 1989, ThripsWiki, 2023). The subfamily Thripinae being the largest and known by 1,775 species in 230 genera followed by Sericothripinae with 175 species in 3 genera, Panchaethripinae with 146 in 42 genera, and Dendrothripinae with 111 species in 13 genera (ThripsWiki, 2023). India is known for 739 species of thrips, accounting for about 12% of the world's thrips species (Tyagi & Kumar, 2016; Singha et al., 2022).

Members of the subfamily Sericothripinae are mainly found on the leaves and weeds of different plant families. It can be easily distinguished from Thripinae by the shape of the mesosternal plate,

**Corresponding author:** Tyagi, K., ✉ [kumud.tyagi5@gmail.com](mailto:kumud.tyagi5@gmail.com)

**Copyright** © 2023, Patidar et al. This is an open access article distributed under the terms of the Creative Commons NonCommercial Attribution License (CC BY NC 4.0), which permits Share - copy and redistribute the material in any medium or format, and Adapt - remix, transform, and build upon the material, under the Attribution-NonCommercial terms.

chitinized plate (blotch) on the pronotum, legs covered with rows of microtrichia in a ring pattern and sub-lateral callosities on the tergites and sternites (Masumoto, 2010). This subfamily Sericothripinae includes three genera, *Hydatothrips* Karny, 1913 (45 species), *Neohydatothrips* John, 1929 (123 species), and *Sericothrips* Haliday, 1836 (7 species) (ThripsWiki, 2023). The genus *Hydatothrips* was originally described by Karny based on the type species *Hydatothrips adolfifriederici* Karny (Karny, 1913). It can be differentiated from the other two genera by having U- or V-shaped invagination on the anterior margin of metasternal plate. In India, the genus *Hydatothrips* is represented by 10 species (Rachana et al., 2022).

Members of the subfamily Thripinae are usually associated with a wide range of plants. Among them, certain species are notorious for their prevalence as serious crop pests and vectors of tospoviruses. These pests pose significant challenges to agriculture. The genus *Thrips* was originally described by Linnaeus in 1758 based on the type species *Thrips physapus*. It is the largest group of the subfamily Thripinae and comprises 303 species across the globe (ThripsWiki, 2023) of which, only 44 species are reported from India (Rachana & Varatharajan, 2017). It can be easily differentiated from the other groups by the absence of ocellar setae I; ctenidium on the lateral side of abdominal tergite VIII located posteromesad to the spiracle. Most of the species of *Thrips* are flowers inhabitant and breed mainly on the leaves (Mound & Ng, 2009).

The objective of this study is to add two species of the order Thysanoptera, *Hydatothrips onari* Kudô, 1997 of Sericothripinae and *Thrips alius* Palmer, 1992 of the subfamily Thripinae to the Indian fauna. Species diagnosis, material methods and distribution are also provided.

## MATERIAL AND METHODS

The traditional beating method is used to collect the thrips specimens from the fields and preserved in 70% alcohol. The specimens were slide-mounted using the method given in ThripsWiki (2023). Some specimens were treated with NaOH to see the chaetotaxy and sculpture, and a few without NaOH treatment to preserve the original colour of the specimens. Nikon SMZ745T microscope was used for slide preparation and a Trinocular Microscope (Leica DM-1000) for taking photographs. Morphological identification is carried by the available keys: Bhatti (1973), Palmer (1992), Wang (2007), Mirab-balou et al. (2011, 2013), and Kudô (1997). Moreover, the mounted slides were registered with a unique registration number and deposited in the National Zoological Collections (NZC), Zoological Survey of India, Kolkata, India.

## RESULTS

### *Taxonomic hierarchy*

**Class Insecta Linnaeus, 1758**

**Order Thysanoptera Haliday, 1836**

**Suborder Terebrantia Haliday, 1836**

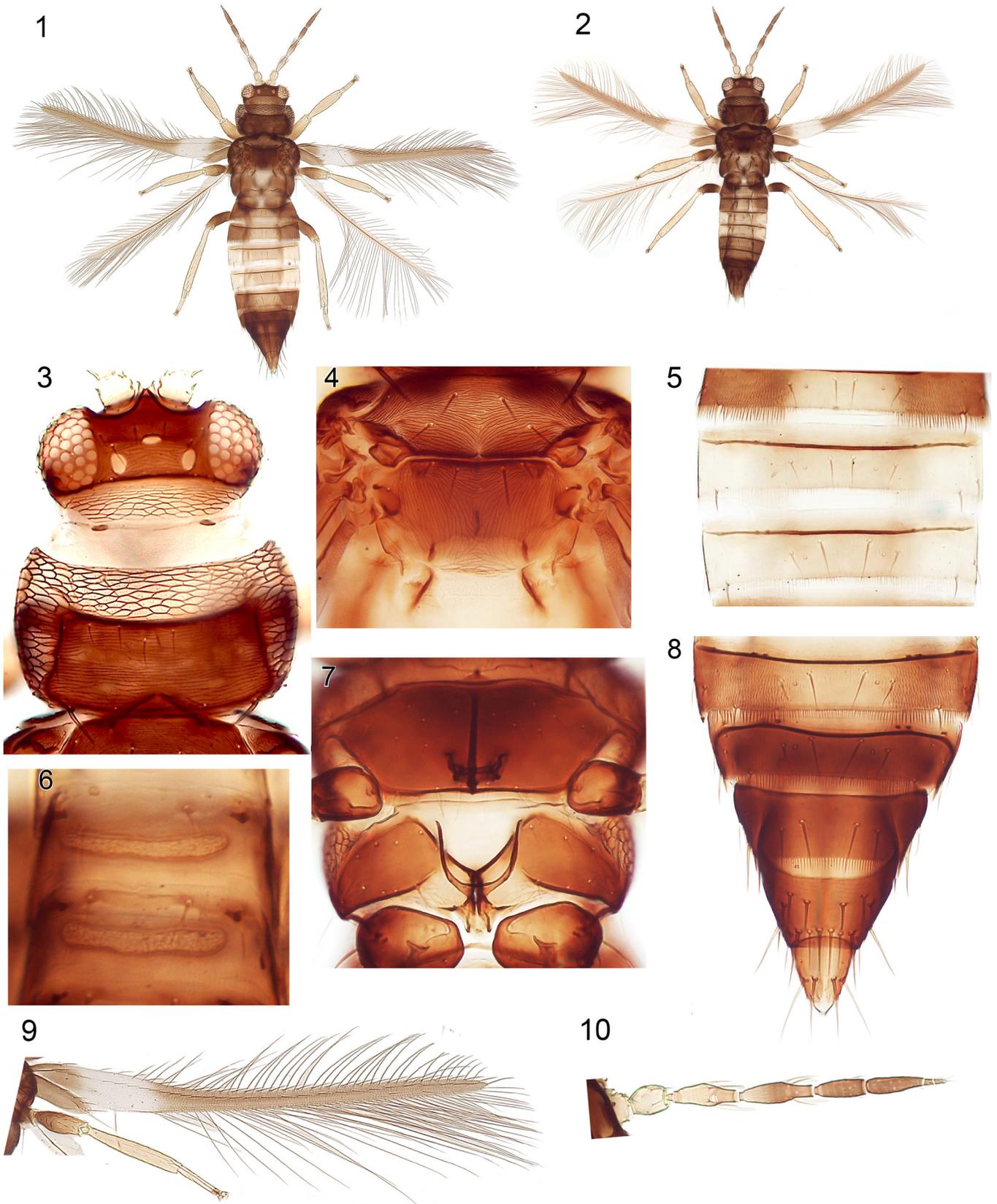
**Family Thripidae Stephens, 1829**

**Subfamily Sericothripinae Karny, 1921**

**Genus *Hydatothrips* Karny, 1913**

***Hydatothrips onari* Kudô, 1997 (Figs 1–10)**

**Diagnosis.** *Female macroptera.* Body brown except abdominal segment IV and V yellow (Fig. 1); antennal segments I–II yellow, III yellow with apex brown; IV brown with basal 1/3 pale; V–VIII brown. Fore wing brown with a pale sub-basal area (Fig. 9). Antennae 8-segmented (Fig. 10). Head wider than long, ocellar triangle with sculpture and internal markings within; occipital apodeme touching posterior margin of eyes (Fig. 3). Pronotum transversely reticulate with internal markings in front of blotch; blotch well defined, transversely striated with internal markings; 2 pairs of posteromarginal setae.



**Figures 1-10.** *Hydatothrips onari* Kudô, 1997. **1.** Female; **2.** Male; **3.** Head and pronotum, female; **4.** Meso- and Metanotum, female; **5.** Abdominal tergites III-V; **6.** Abdominal sternites VI-VII, male; **7.** Meso- and Metasternum, female; **8.** Abdominal tergites VI-X, female; **9.** Fore wing, female; **10.** Antenna, female.

Mesonotum median pair of setae ahead to posterior margin (Fig. 4). Metanotum with transverse sculpture anteromedially and posteromedially, longitudinally striate at middle, with internal markings; median pair of setae well behind anterior margin. Mesosternum with V-shaped invagination on the anterior margin of metasternal plate (Fig. 7). Fore wing first vein with continuous row of setae, second vein with 2 setae (Fig. 9). Abdominal tergite I medially without marginal microtrichia; II–IV with weakly developed marginal microtrichia (Fig. 5); V–VIII with complete row of marginal microtrichia, short in middle (Fig. 8); tergite II–VII with S3 setae arising at posterior margin (Fig. 5). Abdominal sternites without discal setae; discal microtrichia present only laterally. *Male macroptera*. Similar to female, but smaller in size (Fig. 2); sternites VI–VII each with elongated transverse pore plate (Fig. 6).

**Material examined.** India, Odisha, Semiliguda (18°42'00.9"N 82°51'15.0"E), 3♀, 2♂, on *Guizotia abyssinica* (L.f.) Class. (Asteraceae), 28.x.2022, leg. Abhishek Patidar. (Registration No: 12642/H17 to 12646/H17)

**Distribution.** India (**New record**), Japan, Malaysia and China (Mirab-balou et al., 2013).

**Remarks.** This species is very close to *Hydatothrips dorax* Bhatti, 1973 but females can be differentiated from *H. onari* by the colour of the abdominal segment V, antennal segment V and shape of the pore areas on abdominal sternites VI and VII. The abdominal segment V pale yellow in *H. onari* whereas brown in *H. dorax*; antennal segment V brown in *H. onari* and bicoloured in *H. dorax*. Males of *H. onari* can be differentiated by the shape and length of the pore areas on abdominal sternites VI and VII. Pore areas on abdominal sternite VI in *H. onari* 13 times longer than *H. dorax*, and on VII in *H. onari* nearly four times longer than *H. dorax* (Bhatti, 1973, Kudô, 1997).

## Subfamily Thripinae Karny, 1921

### Genus *Thrips* Linnaeus, 1758

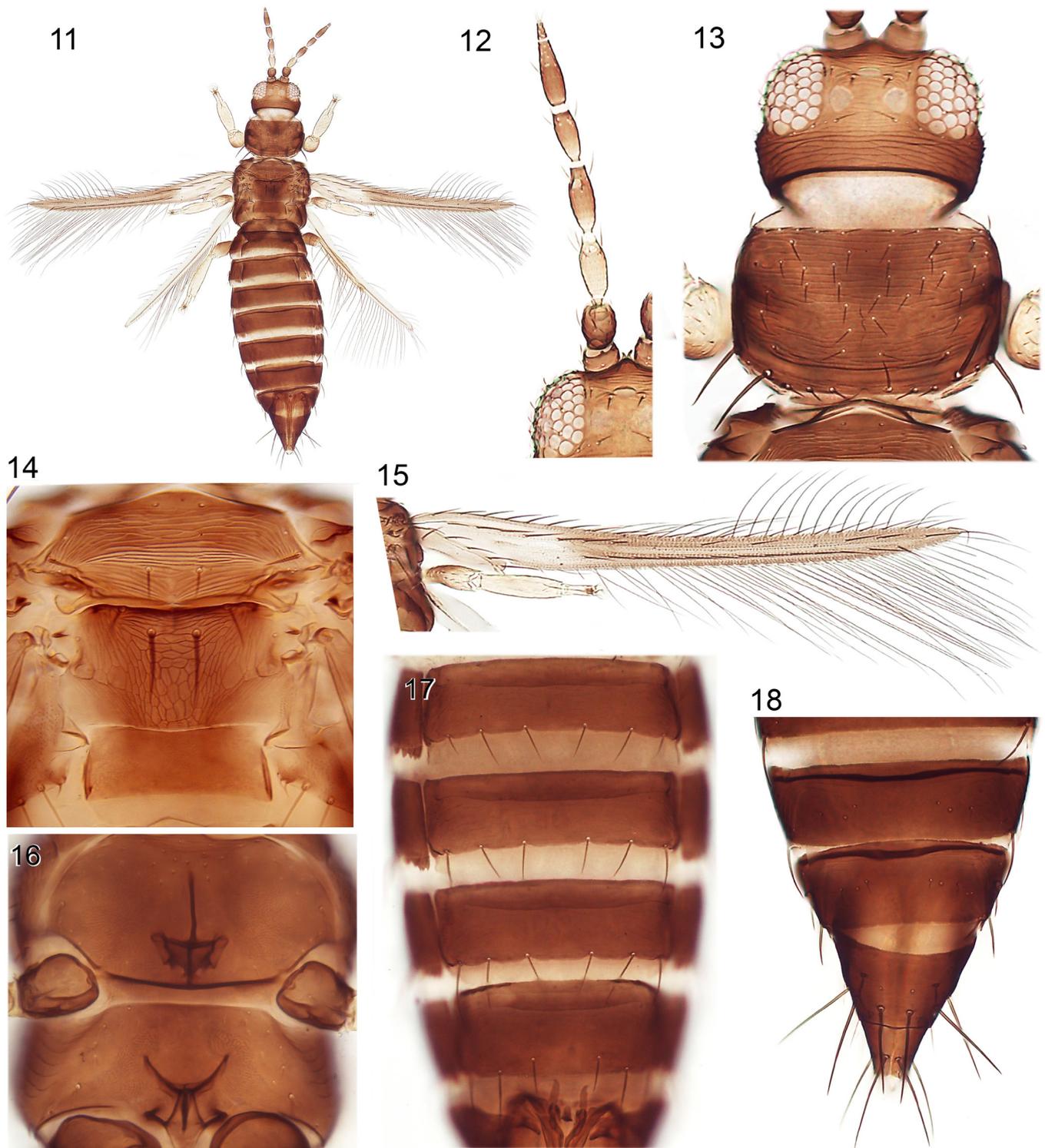
#### *Thrips alius* Palmer, 1992 (Figs 11–18)

**Diagnosis.** *Female macroptera*. Body brown, setae dark; legs pale, mid and hind femora dark (Fig. 11); antennal segment III–V pale with IV and V dark apically, VI paler at base (Fig. 12); forewings paler at base (Fig. 15). Head broader than long with transverse striations; ocellar setae III outside the ocellar triangle; postocular setae I and III well developed, II minute (Fig. 13). Pronotum with striations; posteromarginal setae 3 pairs; posteroangular setae 2 pairs. Mesonotum with transverse striations; median pair of setae far away from the posterior margin; anteromedian campaniform sensilla present (Fig. 14). Metanotum with reticulations having internal markings, arcuate sculpture on the anterior half; median pair of setae placed far behind the anterior margin; campaniform sensilla absent (Fig. 15). Mesosternum with spinula and metasternum without spinula (Fig. 16). Forewing first vein with 7 basal and 4 distal setae; clavus with 5 veinal setae and one apical seta, apical seta longer than subapical (Fig. 15). Abdominal tergite II with 4 setae on each lateral side; VIII with posteromarginal comb absent or with few small microtrichia laterally (Fig. 18). Abdominal sternites and pleurotergites without discal setae (Fig. 17).

**Material examined.** India, West Bengal, Baruipur (22°21'35.3"N 88°25'56.2"E), 2♀, on general vegetation, 22.xi.2022, leg. Madhurima Sarma. (Registration No: 12408/H17 and 12410/H17).

**Distribution.** India (**New record**), China (Mirab-balou et al., 2011), and Philippines.

**Remarks.** This species is most similar to *T. javanicus* Priesner, 1934 and can be differentiated from *T. javanicus* by the following characters: ocellar III outside of the ocellar triangle in *alius* (inside the ocellar triangle in *T. javanicus*); metanotal sculpture with equiangular reticules in *T. alius* (elongated reticulations in *T. javanicus*); fore wing with 7+2+2+1 in *T. alius* (15+1+1 in *T. javanicus*) (Palmer, 1992, Mound, 2005).



**Figures 11-18.** *Thrips alius* Palmer, 1992. Female. **11.** Body; **12.** Antenna; **13.** Head and pronotum; **14.** Meso- and metanotum; **15.** Forewing; **16.** Meso- and Metasternum; **17.** Abdominal sternites IV-VII; **18.** Abdominal tergites VII-X.

## DISCUSSION

Members of the genus *Hydatothrips* are usually flower feeders and associated with unrelated plant families. Out of 45 known species of this genus, only 8 species were reported from India (Rachana & Varatharajan, 2017). Later on, Singha et al. (2022), added one species *H. haschemi* Girault, 1930 in the

Indian fauna. Recently, two new species *H. initium* (Rachana et al., 2022), and *H. longirostris* (Rachana et al., 2023) were described from India. Members of the genus *Thrips* are widely distributed and associated with flowers and leaves of unrelated plant families. Out of 303 species of this genus, 44 species were reported from India (Rachana & Varatharajan, 2017). In the present study, we have collected specimens of two species *H. onari* Kudô (Sericothripinae) from *Guizotia abyssinica* and *Thrips alius* (Thripinae) from the general vegetation during the recent surveys of Odisha and West Bengal states of India. *Hydatothrips onari* was originally described from the Ryukyu Islands, Japan from *Pongamia pinnata* and also recorded from Malaysia from *Desmodium umbellatum* (L.) and *Derris* sp. (Kudô, 1997). Later on, Mirab-balou et al. (2013), reported this species from the Yunnan province of China. *Thrips alius* was originally described from Davao Norte, Tadcoco, Philippines on banana leaf (Palmer, 1992) and also recorded in China (Yunnan province) (Mirab-balou et al., 2011).

#### AUTHOR'S CONTRIBUTION

The authors confirm contribution to the paper as follows: A. Patidar: Field work, photography and writing; M. Sarma: Field work, and mounting the specimens, S. Pal: Photography and writing, V. Kumar: Writing, and reviewing; K. Tyagi: Identification, writing and reviewing. All authors approved the final version of the manuscript.

#### FUNDING

This work was financially supported by the Zoological Survey of India (ZSI) in-house project, 'Fauna of Thysanoptera from Gujarat and Odisha State of India' to V.K. and K.T.

#### AVAILABILITY OF DATA AND MATERIAL

The specimens listed in this study are deposited in . the National Zoological Collections (NZC), Zoological Survey of India, Kolkata, India and are available from the curator, upon request.

#### 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.

#### ACKNOWLEDGMENTS

All the authors are highly thankful to the Director of the Zoological Survey of India (ZSI), for her constant support and encouragement. The new record of *Hydatothrips onari* from Odisha is the part of thesis work of the AP and *Thrips alius* from West Bengal is the part of thesis work of the MS who are pursuing Ph.D. from the University of Calcutta, Kolkata, India. SP is grateful to the Department of Biotechnology, Ministry of Science & Technology, Government of India to provide DBT-JRF fellowship (DBT/2021-22/UOJ/1894).

#### REFERENCES

- Bhatti, J.S. (1973) A preliminary revision of *Sericothrips* Haliday, sensu lat., and related genera, with a revised concept of the tribe Sericothripini. *Oriental Insects*, 7, 403–449.
- Bhatti, J.S. (1989) The classification of Thysanoptera into families. *Zoology*, 2 (1), 1–23.
- Karny, H. (1913) Thysanoptera. *Wissenschaftliche Ergebnisse der Deutschen Zentral-Afrika Expedition 1907–1908*, 4, 281–282.
- Kudô, I. (1997) Malaysian *Hydatothrips* with some species from neighboring areas (Thysanoptera, Terebrantia, Thripidae). *Japanese Journal of Systematic Entomology*, 3, 325–365.

- Masumoto, M. (2010). Key to genera of the subfamily Thripinae (Thysanoptera: Thripidae) associated with Japanese plant quarantine. *Research Bulletin of the Plant Protection Service, Japan*, 46, 25–59.
- Mirab-balou, M., Tong, X.L., Feng, J.N., & Chen, X.X. (2011). Thrips (Insecta: Thysanoptera) of China. *CheckList*, 7 (6), 720–744.
- Mirab-balou, M., Yang, S.L., & Tong, X.L. (2013) One new species, four new records and key to species of *Hydatothrips* (Thysanoptera: Thripidae) from China (including Taiwan). *Zootaxa*, 3641 (1), 74–82. <https://doi.org/10.11646/zootaxa.3641.1.8>
- Mound, L.A. (2005) The *Thrips orientalis* group from Southeast Asia and Australia: some species identities and relationships (Thysanoptera, Thripidae). *Australian Journal of Entomology*, 44 (4), 420–424.
- Mound, L.A. & Ng, Y.F. (2009) An illustrated key to the genera of Thripinae (Thysanoptera) from South East Asia. *Zootaxa*, 2265 (1), 27–47. <https://doi.org/10.11646/zootaxa.2265.1.2>
- Palmer, J.M. (1992) Thrips (Thysanoptera) from Pakistan to the Pacific: a review. Bulletin of the British Museum (Natural History), *Entomology Series*, 61 (1), 1–76.
- Rachana, R.R., & Varatharajan, R. (2017) Checklist of terebrantian thrips (Insecta: Thysanoptera) recorded from India. *Journal of Threatened Taxa*, 9 (1), 9748–9755. <https://doi.org/10.11609/jott.2705.9.1.9748-9755>
- Rachana, R.R., Amarendra, B. & Gracy, R.G. (2022) The Sericothripinae genus *Hydatothrips* (Thysanoptera, Thripidae) in India with description of a new species. *Zootaxa*, 5169 (2), 177–182. <https://doi.org/10.11646/zootaxa.5169.2.5>
- Rachana, R.R., Amarendra, B., & Vanitha, K. (2023). A new species of *Hydatothrips* (Thysanoptera, Thripidae) from India with one new record. *Zootaxa*, 5319 (4), 589–594.
- Singha, D., Patidar, A., Kumar, V. & Tyagi, K. (2022) New records of Thrips (Insecta: Thysanoptera) from India. *Journal of Insect Biodiversity and Systematics*, 08 (1), 145–150. <https://doi.org/10.52547/jibs.8.1.145>
- ThripsWiki (2023) *ThripsWiki - providing information on the World's thrips*. Available from: [https://thrips.info/wiki/Main\\_Page](https://thrips.info/wiki/Main_Page) [Accessed July 2023].
- Tyagi, K. & Kumar, V. (2016) Thrips (Insecta: Thysanoptera) of India: an updated checklist. *Halteres*, 7, 64–98. <https://doi.org/10.5281/zenodo.54896>
- Wang, C.L. (2007) *Hydatothrips* and *Neohydatothrips* (Thysanoptera, Thripidae) of East and South Asia with three new species from Taiwan. *Zootaxa*, 1575 (1), 47–68. <https://doi.org/10.11646/zootaxa.1575.1.3>

## گزارش‌های جدید از خانواده Thripidae (Thysanoptera, Terebrantia) از هند

آبیشک پاتیدار<sup>۱،۲</sup>، شاش پال<sup>۲</sup>، مدهوری‌ما سارما<sup>۱،۲</sup>، ویکاس کومار<sup>۲</sup> و کائومود تیاگی<sup>۲\*</sup>

۱ گروه جانورشناسی، دانشگاه کلکته، هند

۲ بخش سیستماتیک مولکولی، مرکز رده‌بندی DNA، ارزیابی جانورشناسی هند، کلکته، هند

۳ گروه جانورشناسی، دانشگاه جامو، جامو و کشمیر، هند

\* پست الکترونیک نویسنده مسئول مکاتبه: [kumud.tyagi5@gmail.com](mailto:kumud.tyagi5@gmail.com)

ا تاریخ دریافت: ۲۷ تیر ۱۴۰۲ | تاریخ پذیرش: ۲۰ مرداد ۱۴۰۲ | تاریخ انتشار: ۲۴ مرداد ۱۴۰۲ |

**چکیده:** دو گونه تریپس از خانواده Thripidae شامل *Hydatothrips onari* Kudô, 1997 متعلق به زیرخانواده Sericothripinae و *Thrips alius* Palmer, 1992 از زیرخانواده Thripinae به ترتیب از روی گیاه *Guizotia absinica* و پوشش گیاهی عمومی هم برای اولین بار از هند و پس از توصیف اصلی‌شان گزارش شدند. با در نظر گرفتن این دو گونه در هند، تعداد گونه‌های جنس *Hydatothrips* از ۱۰ به ۱۱ و تعداد گونه‌های جنس *Thrips* از ۴۴ به ۴۵ افزایش یافت. خصوصیات افتراقی گونه‌ها همراه با تصاویر و اطلاعات مربوط به انتشار آنها ارائه شد.

**واژگان کلیدی:** *Hydatothrips*، گزارش جدید، *Thrips*، Thripinae، Sericothripinae