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Occurrence of tingid, *Cochlochila bullita* (Stal) (Heteroptera: Tingidae) on Tulsi in Manipur

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ABSTRACT: *Cochlochila bullita* was recently found infesting the tulsi plant causing drying of leaf tips and curling. Nymphs and adults are found both on the lower and upper surfaces of leaves. In Manipur, tulsi is popular in every home because of its medicinal purposes but is found to be hampered mostly by *C. bullita*. The nymphalexuviae can be observed, which represents the severity of the *C. bullita*. The length and breadth of the adults were 2.48 ± 0.15 (2.25-2.69) mm and 1.38 ± 0.07 (1.04-1.17) mm, respectively. The head measured 0.47 ± 0.04 (0.49-0.60) mm in width. Therefore, this study finds out the occurrence of *C. bullita* in tulsi plant with its damaging symptoms and its potential to be the key pest of *Ocimum* species in Manipur. This is the first report of *C. bullita* feeding on the tulsi plant from Manipur, Northeast, India.

Keywords: *Cochlochila bullita*, Tulsi, Damaging, Key pest, Manipur.

INTRODUCTION

Tulsi (*Ocimum tenuiflorum*), also called holy Basil belongs to the mint family, is found mainly in Southeast Asia. It is commonly grown in the courtyards of Hindu homes for worship. The tulsi leaves have antibacterial, antifungal properties and sometimes are used as a bio pesticide for insecticidal properties. Due to its many beneficial purposes, it has a massive demand among investors and farmers to grow it as a plantation crop (Sathe *et al.*, 2014). Tulsi contains essential oils like camphor, linalool, germacren-D and 1, 8 cineole (Arabaci, 2004; Daneshian, 2013). It is helpful in the treatment of chronic colds, anxiety, snake and scorpion bites, fever, diarrhea, cardiovascular, gastric, hepatitis (Das *et al*., 2020). There is a meager article regarding the insect pests of tulsi apart from the work of Butani (1982), Saini & Mahla (1991), David (1993) and Kumar (2014) which reported *Ceroplastodes cajani*, *Dialeurodes* sp., *Pycnarmon cribrata*, *Macrosiphum* sp., and *Helicoverpa armigera* as insect pests of tulsi. Recently, *Cochlochila bullita* (Stal) was found infesting on tulsi plant in Manipur. *C. bullita* is a lace bug reported to attack *Ocimum basilicum* L, *Ocimum sanctum* L, *Ocimum tenuiflorum* L, *Ocimum gratissimum* L., *Ocimum kilimandscharicum* Gurke (Samuel 1939; Sharga 1953; Tigvattnanont, 1989), *Salvia officinalis* L. (sage), *Rosmarinus officinalis* L. (rosemary) and *Carthamus tinctorius* L. (safflower) (Stonedahl *et al.*, 1992, Schaefer and Panizzi 2010). *C. bullita* is extensively found in the Paleotropics, Africa and Southeast Asia in China and as well as in India (Deckert and Gollner-Scheiding, 2006; Guilbert, 2013). In India, it was first reported as a pest of Mentha leaves (Sharga, 1953). It was first reported in the eastern part of India on *O. basilicum* and with a cent per cent infestation in Jharkhand (Kumar, 2014). *C. bullita* was first reported on tulsi plants in Kalyani, West Bengal (Bhattacharyya and Chakravorty 1984). *C. bullita* occurs in Thailand, Southern Asia, India, the United States and China. In Malaysia, it was reported on Cat's whiskers plant *Orthosiphon stamineus* Bentham during 2010 (Triveni *et al*., 2018). It was found that *C. bullita* damage was more severe from October to mid- January and a yield loss of 27.84% on tulsi (Anonymous, 2013). Humidity and temperature influenced the survival and population of *C. bullita* at Saharanpur (Jain and Dhiman 2011). There is a scanty detailed study of the host range, nature of damage, biology and feeding behavior of the *C. bullita* in India. In view of the above fact, this study finds out the occurrence of *C. bullita* with its damaging symptoms in Manipur as it is major pest of *Ocimum* species. This is the first report of *C. bullita* feeding on the tulsi plantfrom Manipur, Northeast, India.

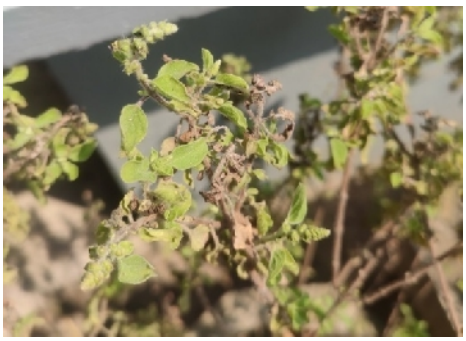
MATERIALS AND METHOD

Cochlochila bullita was recently found infesting on the tulsi plant at Imphal, Manipur (24º47′26.7″N 93º55′22.1″E) in January 2022. The insect was carefully removed using a fine laboratory brush and preserved in 95% alcohol. For species identification, the insects were sent to the ICAR-National Bureau of Agricultural Insect Resource (ICAR-NBAIR), Bangalore. The morphological studies were done through observation under Leica Stereo Zoom SZM S9i.

RESULTS AND DISCUSSION

C. bullita was found feeding on the tulsi plant, causing drying of leaf tip and curling (Fig. 1a). The nymphs were found feeding, which later reduced the chlorophyll content and caused the browning of the leaves. It was found to make the plants wilt, and brown fecal pellets can be seen in severe infestation (Fig. 1b). Nymphs and adults are found both on the lower and upper surfaces of leaves which are similar to the findings of Dhiman and Jain (2010). The nymphalexuviae can be observed, which represents the severity of *C. bullita*. The insects have five nymphalin star stages in which the 4th and 5thnymphalinstars are the most damaging stages which are in comparison with the findings of Pang *et al*., (2015). Sometimes the adults curled from the leaf margin, staying inside the curled leaves which are similar to the findings of Das *et al.* (2020). The leaves which were sucked by the adults observed to have irregular brown patches. The length and breadth of adults were 2.48 ± 0.15 (2.25-2.69) mm and 1.38 ± 0.07 (1.04-1.17) mm, respectively. The head measured 0.47 ± 0.04 (0.49-0.60) mm in width. The results conformed with the works of Sharga (1953); Kumar (2014); Peng *et al*. (2014); Dhiman and Jain (2010); Sajap and Peng (2010), which also reported similar symptoms.

a



b

Fig. 1a Adult of *Cochlochilabullita.*, **1b** Symptoms of damage in tulsi plant

CONCLUSION

This is the first report of *C. bullita* feeding on the tulsi plant from Manipur, Northeast, India. More studies on *C. bullita* are needed as the genus *Ocimum* contains many economically important medicinal and aromatic plants species and its severity has been reported in other parts of India as akey pest of *Ocimum* species. Therefore, it is essential to study its host plant, feeding behavior and host-specific interactions to enable a greater understanding of this insect.

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Conflict of Interest. None.

REFERENCES

Anonymous (2013). Annual Report, Directorate of Medicinal and Aromatic Plants Research, Boriavi, Anand, Gujarat, India, 68.

Arabaci, O. (2004). The effect of nitrogen fertilization and different plant density on some agronomic and technologic characteristic of *Ocimum basilicum*. *Journal of Agronomy, 3*: 255−262.

Bhattacharyya, S. and Chakravorty, S. (1984). Incidence of the insect *Cochlochila bullita* on the tulsi plant at Kalyani. *Environment and Ecology, 2*(1): 73−74.

Butani, D. K. (1982). Insect pests of tulsi (*Ocimum sanctum* Linnaeus) and their control. *Pesticides*, *16*: 11-12.

Daneshian, M. (2013). Evaluation of Basil (*Ocimum basilicum* L.) – essential oil content and yield under different plant densities and nitrogen levels. *Journal of Medicinal Plants and by-Products*, *2*: 159−162.

Das, U., Pal, S. and Ponnusamy N. (2020). Biology and Seasonality of Lace bug *Cochlochila bullita* (Stal) (Heteroptera: Tingidae) on Tulsi *Ocimum sanctum* L. *International Journal of Bio-resource and Stress Management*, *11*(2): 114-118.

David, B.V. (1993). Biodiversity in white flies (Aleyrodidae :Homoptera). *Hexapoda*, *5*: 165-170

Deckert, J. and Gollner-Scheiding, U. (2006). Lace bugs of Namibia (Heteroptera, Tingoidea, Tingidae). Denisia19, zugleich Katalogeder OO. *Landesmuseen Neue Serie*, *50*, 823−856.

Dhiman, S. C. and Datta, O. (2013). Seasonal occurrence of *Cochlochila bullita*: A severe pest of *Ocimum basilicum*. *Annals of Plant Protection Sciences*, *21*: 176-223.

Guilbert, E. (2013). Lace bugs database. Muséum Nationale D'Histoire Naturelle, Paris. http:// hemiptera-databases.org/cgi-bin/Tingidae/tingidae.pl?lang=en. Accessed on December, 2019.

Jain, S. and Dhiman, S. C. (2011). Some observations on the early biological stages of Eusarcocoriscapitatus Distant, A pest of holy Tulsi (*Ocimum sanctum* L.). Uttar Pradesh. *Journal of Zoology*, *30*: 159−164.

Kumar, A. (2014). The lace bug *Cochlochila bullita* (Stål), A destructive problem of *Ocimum sanctum* in Jharkhand, India. *Phytoparasitica*, *42*: 295-302.

Peng, T. L., Sajap, A. S., Jeen, L. H., Hua, L. S. and Chen, L. W. (2014). Occurrence of *Cochlochila bullita* Stål in Malaysia. Serangga, *19*: 67-76.

Peng, T. L., Sajap, A.S., Jeen, L. H., Hua, L. S. and Chen, L. W. (2015). Life table of *Cochlochila bullita* Stal (Hemiptera: Tingidae) on *Orthosiphon aristatus* (Blume) Miq. And *Ocimum basilicum* L. in Laboratory conditions. *Journal of Tropical Agricultural Sciences*, *38*(4): 499−508.

Saini R. K. and Mahla, J. C. (1991). Incidence and survival of *Helicoverpa armigera* (Hubn.) larvae on some weeds in Haryana. *Journal of Insect Sciences*, *4*: 178-179.

Sajap, A. A. and Peng, T. L. (2010). The lace bug *Cochlochila bullita*(Stal) (Heteroptera: Tingidae) a potential pest of *Orthosiphon stamineus* Bentham (Lamiales: Lamiaceae) in Malaysia. *Insecta Mundi*, 0136:1-5.

Samuel, C. K. (1939). Oviposition of the tinged *Monanthia globulifera* Wlk. *Indian Journal of Entomology*, *1*: 89-99

Sathe, T. V., Sathe, N. T., Ghodake, D. and Sathe, A. (2014). Sucking insect pests of medicinal value of tulsi *Ocimum sanctum* L. (Lamiaceae). *Indian Journal of Applied Research*, *4*(3).

Schaefer, C. W. and Panizzi, A. R. (2010). Heteroptera of economic importance.CRC, New York, New York. 828p

Sharga, U. S. (1953). Bionomics of *Monanthia globulifera* Walk (Hem. Het. Tingidae). *Journal of the Bombay Natural History Society*, 51:885-889.

Stonedahl, G. W. and Dolling, D. G. (1992). Identification guide to common tingid pests of the world (Heteroptera: Tingidae). *International Journal of Pest Management*, *38*: 438-449.

Tigvattnanont, S. (1989).Studies on the bionomics and local distribution of some lace bugs in Thailand: I. *Monanthia globulifera* (Heteroptera: Tingidae). *Khon Kaen Agriculture Journal*, **18**: 200-212.

Triveni, B., Jagadish, K. S., Devika, R., Vasundhara, M., Narayanaswamy, K. C. and Jemla Naik. D. (2018). *International Journal of Chemical Studies*, *4*: 29-36.

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