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## OCCURRENCE OF *COCHLOCHILA BULLITA* STÅL IN MALAYSIA

Tan Li Peng<sup>1</sup>, Ahmad Said Sajap<sup>1</sup>, Lee Han Jeen,  
Lee Seng Hua and Lum Wei Chen

<sup>1</sup>Faculty of Forestry, Universiti Putra Malaysia;

<sup>2</sup>Faculty of Veterinary Medicine, Universiti Malaysia Kelantan

### ABSTRACT

The first occurrence of Lace bug, *Cochlochila bullita* Stål, was recorded in Malaysia in year of 2010. Description of this species was made. Damage on *Ocimum basilicum* and *Orthosiphon aristatus* caused by *Cochlochila bullita* Stål was investigated in this study. Symptoms of the infested plants were also described. Possible control method against this pest was also suggested.

**Keywords:** *Cochlochila bullita*, *Ocimum basilicum*, *Orthosiphon aristatus*, description, Lace bug

### ABSTRAK

Rekod pertama Lace bug, *Cochlochila bullita* Stål telah dicatat di Malaysia pada tahun 2010. Ciri-ciri tentang spesies ini telah dibentangkan di kertas ini. Kerosakan yang disebabkan oleh *Cochlochila bullita* Stål terhadap *Ocimum basilicum* and *Orthosiphon aristatus* telah disiasat dalam kajian ini. Kaedah kawalan terhadap perosak ini juga disyorkan dalam kertas ini.

**Kata kunci:** *Cochlochila bullita*, *Ocimum basilicum*, *Orthosiphon aristatus*, perihalan, Lace bug

## INTRODUCTION

The *Ocimum tingid*, *Cochlochila bullita* Stål (Figure 1), is a potentially serious pest of ocimum and related Lamiaceae, and some other related culinary and medicinal herbs (Samuel 1939; Sharga 1953; Tigvatnont 1989; Stonedahl *et al.* 1992). *Ocimum tingid* occurs in the Old World tropics and its records mostly founded in India and also been studied in Thailand (Tigvatnont 1989). In 2010, when it was finally discovered in Malaysia, it was a new record for Malaysia.



**Figure 1.** Adult *Ocimum tingid*, *Cochlochila bullita* Stål.

## DISTRIBUTION

This species has been recorded from China, Taiwan, Philippines, South East Asia, India and Sri Lanka, Australia as well as some African countries. In Malaysia, *Ocimum tingid* was first discovered in Subang, Selangor in 2010 on a well-known medicinal plant, *Orthosiphon aristatus* BlumeMiq. Since then, it was found in Serdang, Selangor and also Melacca attacking another well-known culinary herb, *Ocimum basilicum* Linn.

## DESCRIPTION

**Adults.** The adults of the *Ocimum tingid* are delicate minute bugs with only 2 mm in length. It has lacy wings with brown swollen part at the discoidal area. The costal margin is relatively curved outward and very slightly concave. The adults have a prominent hood-like pronotum that covering their head. Body and wing's lacework are dark-brown in colour. The external male and female genitalia have diagnostic characters, where the end of the female's abdomen with V form genitalia capsule and U forms in male (claspers) (Peng et al, 2013).

**Nymphs.** The nymph is yellowish with red eyes upon hatching but soon turns into pale brown (Figure 2). It goes through five instars, ranging in length from 0.6 mm to 1.9 mm. Spines and pronotum become more prominent after second instars. Wing pads can be seen after the fourth molt (Peng et al, 2013).



**Figure 2.** Nymphs of *Ocimum tingid*, *Cochlochila bullita* Stål feed aggregately.

**Egg.** The dark brown coloured eggs are oblong and slightly tapered towards the opercula end (Figure 3). It is 0.52 mm long and 0.12 mm wide. Eggs are usually laid either in cluster form or singly into the plant's tissue leaving only the opercula exposed (Sharga, 1953; Samuel, 1939 and Tigavattnanont, 1989).



**Figure 3.** Eggs of *Ocimum tingid*, *Cochlochila bullita* Stål.

### LIFE HISTORY

Females lay singly embedded eggs on the midrib, vein and margin of leaves or cluster of eggs on the young stems. Over 254 eggs are laid on the *O. basilicum* with longevity of 58 days and 44 days respectively for the males and females. The incubation period of eggs is 6.5 days and the development of five nymph's stadia is 8.9 days (Tigavattnanont, 1989). Nymphs emerge from the eggs and feed in aggregately, often on the shoots or young leaves. They live in tropic area and are multivoltine that can produce several generations throughout the year.

### HOST PLANT

Recognition of the host plant may provide some information in identifying lace bugs because they are generally fairly host-specific, either monophagous or oligophagous (Drake and Ruhoff 1965). The *Ocimum tingid* is particularly injurious to basil (*Ocimum* spp.) varieties.

Nearly all host plants are in the family Lamiaceae, some of the hosts include:

- Camphor basil, *Ocimum kilmandscharicum* Linn.
- Sweet basil, *Ocimum basilicum* Linn.

- Tulsi, *Ocimum tenuiflorum* Linn.
- Mint, *Mentha* spp.
- Lavender, *Lavandula* spp.
- Safflower, *Carthamus tinctorius* Linn.
- Rosemary, *Rosmarinus officinalis* Linn.
- Cat's whiskers Plant, *Orthosiphon aristatus* Blumemiq.

### DAMAGE

Severely damaged leaves become heavily discolored and eventually wilt or fall off, damage on *O. aristatus* is more severe than happened on *O. basilicum* with almost all of the upper leaves were fall (Figure 4 to 6). The damage caused by *C. bullita* on the quality of *O. basilicum* as happened on *O. aristatus* can be very serious during the dry season. The lace bugs tend to reproduce profusely on new growth and nymphs invariably remain on the plant throughout the season. With their inherent water stress during the dry season, the plants wilt at a much faster rate when *C. bullita* infestation is present. Besides, the population of *C. bullita* tended to be high during the dry season as stated by Sharga, 1953, this bug is more abundant in India from March to June.



**Figure 4.** Damage caused by *Ocimum tingid*, *Cochlochila bullita* Stål on *O. basilicum*.



**Figure 5.** Close-up damage caused by *Ocimum tingid*, *Cochlochila bullita* Stål on *O. basilicum*.



**Figure 6.** Severe damage caused by *Ocimum tingid*, *Cochlochila bullita* Stål on *O. aristatus*.

## SURVEY

Symptoms and signs of infestation include (Figure 7 & 8):

1. leaves with chlorotic and stippling;
2. curling of leaves (may harbour lace bugs);
3. shoots wilted or “flagging”;
4. succulent branches of green shoots may harbour cluster of eggs
6. brown faeces and casted skins on the surface of leaves



**Figure 7.** Stippling caused by *Ocimum tingid*, *Cochlochila bullita* Stål and also brown faeces excreted by the bugs.



**Figure 8.** Cluster of eggs inserted at the succulent stem of the host plant.

## MANAGEMENT

### Monitoring

Plants should be monitored weekly during dry season for the presence of lace bugs. The presence of the *Ocimum tingid* can be observed with the wilting shoots, as they often feed on the shoots and also younger parts of the plant. It is important to sample the leaves and look for the casted skins.

**Cultural control**

Maintaining healthy and turgid plants with proper watering reduces plant stress as well as damage potential.

**Mechanical control**

Water can dislodge the lace bug from the plants. This can be shown during the rainy season, less damage was observed and fewer lace bugs were present.

**Chemical control**

Insecticidal soap, horticultural oil, neem oil and most synthetic insecticides provide good control (Reeves 2006). Contact and systemic poison like acephate and imidacloprid are suitable for controlling this pest (Klingeman *et al.* 2000; Balsdon *et al.* 1993).

**Biological control**

Predators, *Brumus saturalis* F., *Chilmenes sexmaculatus* F. and *Coccinella septempunctata* L. and parasitoids, *Parallelaptera polyphaga* were reported as a natural enemies of *Ocimum tingid* (Sharga 1953; Livingstone and Yaccob 1987). Besides, entomopathogenic fungus, such as *Sporothrix insectorum*, *Beauveria bassiana*, *Isaria fumosorosea* and *Metarhizium anisopliae* (Santos 2010; Koo *et al.* 2007; Tanzini 2002) can be also used to control this pest as had been used for controlling other lace bug.

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