



## Damage characteristics and management of *Oulema pectoralis* (Family: Chrysomelidae) in an orchid setting

Kumara Thevan Krishnan<sup>1\*</sup>, Fatimah Kayat<sup>1</sup> and Akmal Adilah Idris<sup>1</sup>

<sup>1</sup>Department of Agricultural Science, Faculty of Agro-Based Industry, Universiti Malaysia Kelantan, 17600 Jeli, Kelantan, Malaysia

\*Correspondence: [thevan@umk.edu.my](mailto:thevan@umk.edu.my) at Department of Agricultural Science, Faculty of Agro-Based Industry, Universiti Malaysia Kelantan, 17600 Jeli, Kelantan, Malaysia

**Citation:** Kumara Thevan Krishnan, Fatimah Kayat and Akmal Adilah Idris (2022). Agriculture Reports, 1(2): 25-28.

**Received:** 13 July 2022

**Accepted:** 30 July 2022

**Published:** 31 August 2022

**eISSN Number:** 2948-4138



This is open access article published by Multidisciplinary Sciences Publisher. All rights reserved. Licensed under a



**Abstract:** Orchids are high-value flowers cultivated for their ornamental value. Pest infestation is one of the significant factors limiting the quality production of these flowers. A cross-sectional study was carried out when pest infestation was observed on an orchid farm. Damage characteristics were observed, and eggs, larvae, cocoons, and adults were sampled. The pest was identified as *Oulema pectoralis*. At the same time, chemical and physical measures were adopted to control the population to avoid further damage to the nearby flowering orchids.

**Keywords:** Orchids; *Oulema Pectoralis*; Ornamentals; Flowers; Control

### 1. INTRODUCTION

The total production value of orchids in Malaysia is valued at RM99.3 million (AgroFood Statistics, 2019). However, the depth of the damage characteristic and control mechanism is not well known. In Asian countries, the status of the orchid pest was documented in Korea (Kim *et al.*, 2005), Malaysia (Jong *et al.*, 1996; Nashriyah *et al.*, 2010), and Philippines (Hirao *et al.*, 2001). *Oulema pectoralis* is a serious pest documented in Malaysia and the Philippines that can cause total loss if it remains uncontrolled on the orchid farm (Nashriyah *et al.*, 2010; Hirao *et al.*, 2001). However, the pest control protocol was not discussed in depth. In Peninsular Malaysia, Salleh (1989) recorded 19 species from the genus *Oulema*. Among these 8 are of the Indo-Malayan; 2 species are considered endemic to Peninsular Malaysia, and 6 are distributed in Sumatra, Borneo, and Java (Salleh, 1989). Although *Oulema pectoralis* has been reported to have caused pest infestation towards orchid, its damage characteristic and control mechanism was not explained in Malaysia. Therefore, in this study, the damage characteristic and its control mechanism are laid out to guide current and future orchid enthusiasts in managing this pest.

## 2. MATERIALS AND METHODS

A cross-sectional study was conducted at the orchid master farm in Universiti Malaysia Kelantan, Jeli, Kelantan, Malaysia. The farm was established on April 2021, and beginning in July 2021, pest infestation on the flower was observed. Sampling was carried out on the 5<sup>th</sup> of July 2021. Adult specimens were preserved in 70% alcohol. Larvae and cocoons were reared, and once they emerged, the adults were killed and kept in 70% for identification. Damage characteristics of the pest were observed in the fields. Species identification was conducted using taxonomic keys provided in Borror and DeLong and Salleh (1989). At the same time, a pest control regime was conducted at the orchid farm using chemical control and physical control removal of the adults from the farm.

## 3. RESULTS AND DISCUSSION

The researchers observed that the eggs were laid on the flower buds (Figure 1 -A). Once hatched, the larvae were found to have fed upon the buds (Figure 1-B). Then, the larvae formed clustered cocoons (Figure 1-C). Meanwhile, the adults (Figure 1-D-E) were observed to feed on the sepal and petals of the bloom flowers. Both the larvae and the adults can cause (Figure 1-E-F) 100% losses if they remain uncontrolled. *Oulema pectoralis* is a major pest of Vanda and Dendrobium, Lilioceris sp. (Hirao et al., 2001). The eggs are about ~1mm in length and are yellow. The larva feeds on the flower buds and is covered with slimy exudation and faecal materials. During prepupation, the mature larva excretes a whitish sponge-like substance for its cocoon (Figure 1-C). Hirao et al. (2001) reported the immature life cycle takes 24 days. Meanwhile, the adult beetles attain sexual maturity at 2-3 weeks after emergence. Chemical control was done at different combinations of insecticides to avoid pesticide resistance; 1. chlorpyrifos (1.1ml/L) + imidacloprid (2.5ml/L); 2. chlorpyrifos (1.1ml/L) + amitraz (1.5ml/L); alternating every 2 weeks. The chemical control managed to control the population of *O. pectoralis* and reduce the damage to the flowers. However, due to the presence of the *O. pectoralis* in the ecosystem, recurrence occurs. Therefore, observation of damaged characters needs to be conducted frequently. In addition, physical control, catching and destroying the adult *O. pectoralis* by farm workers were conducted after chemical control. However, these incur labour costs. In Malaysia, Nashriyah et al. (2010) tried to use 10% *Lantana camara* to control *O. pectoralis*, but it was unsuccessful.



**Figure 1:** Life stages of *Oulema pectoralis* and its damage characteristics. A- The eggs of *O. pectoralis*; B- Larvae of *O. pectoralis* feeding on the bud flower; C- cocoon of *O. pectoralis* in the cluster; D- Adult *O. pectoralis*; E- damage done by the adult *O. pectoralis* on the flower; F- Total destruction of the flower stalk done by the *O. pectoralis*.

#### 4. CONCLUSION

This case study provide an effective control methods to managed *O. pectoralis*. At the moment, the damage characteristic is only observed in commercial farm settings involving Mokara chark kuan pink and Mokara ruby red varieties. The infestation of this pest in the other commercial types and wild orchids needs to be further investigated.

#### Patents

Not applicable.

**Author Contribution:** Conceptualization, K.T.K; methodology, K.T.K., F.K; resources, F.K., A.A.I. All authors have read and agreed to the published version of the manuscript.

**Funding:** Not applicable

**Institutional Review Board Statement:** Not applicable

**Informed Consent Statement:** We would like to express our gratitude to Dr Yusof Husin, Hexagon Green Sdn. Bhd. for his help and guidance throughout the study period.

**Conflicts of Interest:** No conflict of interest

## References

- Go, R., & Akmal, R. 2017. Discovering the Wonders of Malaysian Orchids. Universiti Putra Malaysia Press, Serdang, Malaysia. pp. 87.
- Hirao, G. A., Gabriel, B. P., & Facundo, H. T. 2001. Life history and habits of the orchid lema, *Lema pectoralis* Baly (Coleoptera: Chrysomelidae), a major pest of orchids. The Philippine Agriculturist. 84. 166-170.
- Salleh, M. S. 1989. The genus *Lema* Fabricius from Peninsular Malaysia (Coleoptera: Chrysomelidae: Criocerinae). Indo-Malayan Zoology 6, 88-99.
- Meena, N. K., Pal, R., Barman, D., & Pant, R. P. 2018. Indegenous approaches of orchids pest management in North East India. Indian Journal of Traditional Knowlwdge 17, 209-214.
- Nashriyah, M., Ros, A. A., Salmah, M., & Norimah, Y. 2010. Control of *Oulema pectoralis* beetle in Mokara chark Kuan Pink Orchid through spraying of *Lantana camara* weed 10% leaf water extract in the field. Asia Pacific Journal of Molecular Biology and Biotechnology, 18, 209-215.
- Kim, D. H., Cho, M. R., Kang, T. J., Yang, C. Y., Kim, H. H., & Yoon, J. B. 2015. The status of pest occurrence on phalaenopsis orchid in Korea. Korean Journal Applied Entomology, 54, 345-349.
- Lim, H. J., Mohd. Ridzuan, M. S., & Nor, A. H. 1996. Cut flower production in Malaysia. *Malaysian Agricultural Research and Development Institute (MARDI), Malaysia*. <http://www.fao.org/3/ac452e/ac452e06.htm#fn6> .[Accessed 31 August 2021].
- AgroFood Statistics*. 2019. Ministry of Agriculture and Food Industries, Malaysia. Published by: Policy and Strategic Planning Division. pp59, ISSN 2232-0407.