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Defense Responses of Different Rice Varieties Affect Growth Performance and Food Utilization of *Cnaphalocrocis medinalis* Larvae

Xiaoyu Zhao^{1,2}, Hongxing Xu¹, Yajun Yang¹, Tianyi Sun^{1,3}, Farman Ullah¹, Pingyang Zhu⁴, Yanhui Lu², Jianlei Huang², Zhengliang Wang², Zhongxian Lu^{1*} and Jiawen Guo^{1*}

Abstract

Rice leaf folder, *Cnaphalocrocis medinalis* (Guenée), is one of the most serious pests on rice. At present, chemical control is the main method for controlling this pest. However, the indiscriminate use of chemical insecticides has non-target effects and may cause environmental pollution. Besides, leaf curling behavior by *C. medinalis* may indirectly reduce the efficacy of chemical spray. Therefore, it is crucial to cultivate efficient rice varieties resistant to this pest. Previous studies have found that three different rice varieties, Zhongzao39 (ZZ39), Xiushui134 (XS134), and Yongyou1540 (YY1540), had varying degrees of infestation by *C. medinalis*. However, it is currently unclear whether the reason for this difference is related to the difference in defense ability of the three rice varieties against the infestation of *C. medinalis*. To explore this issue, the current study investigated the effects of three rice varieties on the growth performance and food utilization capability of the 4th instar *C. medinalis*. Further, it elucidated the differences in defense responses among different rice varieties based on the differences in leaf physiological and biochemical indicators and their impact on population occurrence. The results showed that the larval survival rate was the lowest, and the development period was significantly prolonged after feeding on YY1540. This was not related to the differences in leaf wax, pigments, and nutritional components among the three rice varieties nor to the feeding preferences of the larvae. The rate of superoxide anion production, hydrogen peroxide content, and the activity of three protective enzymes were negatively correlated with larval survival rate, and they all showed the highest in YY1540 leaves. Compared to other tested varieties, although the larvae feeding on YY1540 had higher conversion efficiency of ingested food and lower relative consumption rate, their relative growth was faster, indicating stronger food utilization capability. However, they had a lower accumulation of protein. This suggests that different rice varieties had different levels of oxidative stress after infestation by *C. medinalis*. The defense response of YY1540 was more intense, which was not conducive to the development of the larvae population. These results will provide new insights into the interaction mechanism between different rice varieties and *C. medinalis* and provide a theoretical basis for cultivating rice varieties resistant to this pest.

*Correspondence:
Zhongxian Lu
lxzxm163@163.com
Jiawen Guo
guojawen99@126.com

Full list of author information is available at the end of the article.



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Varieties Of Affect

Henry Trentham Butlin



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Society Cambridge Philosophical Society,1902 *Queensland Agricultural Journal* ,1928 **The British Journal of Dermatology** ,1899 Vol 9 no 9 vol 28 includes a survey of current dermatological literature quarterly *A Guide to the Examination of the Blood for Diagnostic Purposes* Richard Clarke Cabot,1897 **Multiaged Silviculture** Kevin Laughlin O'Hara,2014 This book presents the latest scientific and management information on multiaged silviculture an emerging strategy for managing forestry systems worldwide Over recent decades forest science and management have tended to emphasize plantation silviculture Whilst this clearly meets our wood production needs many of the world s forests need to be managed far less intensively and more flexibly in order to maintain their natural ecosystem functions together with the values inherent in those processes Developing multiaged management strategies for these complex forest ecosystems represents a global challenge to successfully integrate available science with sustainable management practices Multiaged Silviculture covers the ecology and dynamics of multiaged stands the management operations associated with regeneration tending and stocking control and the implications of this strategy on production genetic diversity and stand health It is primarily aimed at graduate level students and researchers in the fields of forestry and silviculture but will also be of relevance and use to all professional foresters and silviculturists Research and Related Services in the United States Department of Agriculture United States. Agricultural Research Administration,1951 American Agriculturist ,1890 Bulletin ... United States. Forest Service,1903

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