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NOTE

Oviposition behaviour of *Scirpophaga incertulas* (Walker) (Lepidoptera: Pyralidae) on Sarawak rice landraces

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ABSTRACT: The yellow rice stem borer, *Scirpophaga incertulas* (Walker) is an important pest of rice in Sarawak, Malaysian Borneo. For a better management of this pest, it is crucial to understand the oviposition behaviour of *S. incertulas* which is unknown for Sarawak rice landraces. This study observed several aspects of *S. incertulas* oviposition behaviour on Sarawak rice landraces in a net house experiment. Adult female stem borers were collected using light trap from the nearby rice field at night. A total of 180 females of *S. incertulas* were given access to six different rice landraces at three plant ages. The results indicated that rice plants at four-month old (heading to flowering) were strongly preferred for oviposition regardless of landraces. The vertical distribution of egg masses on plant were varied. Oviposition on leaf surfaces showed a clear preference on the abaxial leaf surface. To summarize, *S. incertulas* showed no oviposition preference to the six rice landraces tested in this study. The morphology of rice plants will affect the oviposition behaviour of *S. incertulas*.

KEY WORDS: Oviposition behaviour, rice stem borer, Malaysia, Sarawak rice landraces, *Scirpophaga incertulas.*

INTRODUCTION

Rice stem borer is one of the most serious pests that attacks rice plant worldwide. The infestation can occur from seedling to maturity stage. Litsinger *et al.* (1987) reported that rice stem borers have been most strongly associated with serious yield loss among other insect pests attacking rice due to their pervasiveness and type of injury. The crop losses due to rice stem borers varies in time and space. It has been reported that rice stem borers had caused 10% of rice yield reduction in Malaysia (Dale, 1994). While in Sarawak (in Malaysian Borneo), a statewide rice pests survey carried out from 2009 to 2011 in 166 rice fields showed that 11.4 % of rice damage in the fields were caused by rice stem borers (Gumbek and Hamsein, 2011). There are at least five species of Lepidopterous rice stem borers known to occur in Sarawak viz., *Scirpophaga incertulas* (Walker), *Scirpophaga innotata* (Walker), *Chilo suppressalis* (Walker), *Chilo auricillius* (Dudgeon) and *Sesamia inferens* (Walker) (Rothschild, 1971; Hamsein, 2011). Among these five rice stem borers, the yellow stem borer, *S. incertulas* is the most common and important pest of deepwater rice (Khan *et al*., 1991). The borer is also highly adapted to a wetland environment (Litsinger *et al*., 2009).

Most farmers depend on insecticides to control insect pests. The indiscriminate use of insecticides has led to many negative impacts on environment and human health (Ansari *et al*., 2014). In addition, heavy insecticide usage has also led to the development of insecticide resistant insect (Dar *et al*., 2006). For example, rice stem borers in Taiwan are developing resistance to different recommended insecticides (Cheng *et al*., 2010; Li *et al*., 2011). To reduce the dependency on chemical control, integrated pest management (IPM) programs are introduced. The IPM approach relies on the combination of biological, chemical and cultural control methods, and the use of insect resistant rice varieties (Heinrichs, 1994). To obtain insect resistant rice varieties, deploying resistance breeding program is needed.

Sarawak rice landraces may possibly use as genetic resource for breeding rice with insect resistance. This suggestion is based on the observation on the agriculture practice of local farmers. In Sarawak, the local farmers usually cultivate a few varieties of rice in small scale and apply low level of pesticides and chemical fertilizers. By cultivating a few varieties, the production will suffer less disease and pest damage (Teo, 2007). Among the few varieties cultivated by a farmer, there might have presence of resistant (or tolerant) variety (ies) which reduces the damages impose by diseases and pests (Niks *et al*., 2011) especially during disease or pest outbreak. Unfortunately, study on the insect resistance of Sarawak rice landraces is limited.

In this study, antixenosis of Sarawak landraces towards *S. incertulas* was studied based on oviposition behaviour. Oviposition behaviour is one of the responses that can be evaluated for determining plant resistance (Saxena, 1989). Chemical compounds on the plant surface and the plant physical characteristics at the site