

## SOME STUDIES ON ATTRACTION OF VARIOUS PLANTS OFFERED AS FOOD TO *MYTHIMNA SEPARATA* (WALK.) (NOCTUIDAE: LEPIDOPTERA)

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### ABSTRACT

In order to elaborate the feeding preference of *Mythimna separata* (Walk.), fifteen plants viz., chulai (*Amaranthus viridis*), dib (*Typha angustata*), garlic (*Allium sativum*), gram (*Cicer arietinum*), khabbal (*Cynodon dactylon*), Korbooti (*Euphorbia belioscopia*), okra (*Hibiscus esculentus*), maize (*Zea mays*), makoh (*Solanum nigrum*), onion (*Allium cepa*), potato (*Solanum tuberosum*), rice (*Oryza sativa*), sorghum (*Sorghum vulgare*), sugarcane (*Saccharum officinarum*) and water grass (*Phragmites karka*) were tested for their preference / non preference as food plants in a choice test to *M. separata*. The leaves of sugarcane were found to be most preferred followed by sorghum, maize, khabbal, gram and rice while the leaves of onion, garlic and okra the least preferred. The possibility of using some of the most preferred plants as trap crop is discussed.

### INTRODUCTION

*Mythimna separata* (Wall.) is an important polyphagous insect of sporadic occurrence. Its unchecked multiplication results in outbreak amounting to a total loss of vegetation over a given vast area (Bai *et al.*, 1990). Defoliation in maize was reported to be 44% due to its attack (Hill and Atkins, 1988).

The seedlings of wild rice were readily consumed by *M. separata* but older rice plants of IR-20, IR-48, IR46, B-441 and B-126 were heavily damaged by 2<sup>nd</sup> and 3<sup>rd</sup> instar larvae (Wilde and Apostol, 1983). Rice was preferred host plant over sugarcane. The larvae, fed on leaves of rice, produced fecal matter and were heavy on rice than on sugarcane and wheat. Convertibility of vegetative matter into body mass of the insect was efficient on rice than on barley. *Cyperus rotundus* and *C. dactylon* were least favoured and larvae on *C. rotundus* failed to oviposit (Singh and Chaudhary, 1987). Amongst many other plants, the order of preference of *M. separata* was maize > sorghum > sugarcane > oats > wheat > bajra > khabbal > barley > rice > moong > mash > guara > groundnut > jute > dib > watergrass > potato (Ali, 1993). In addition to rice, *Paspalum scrobiculacum*, *Digitaria oiliarre*, *P. paspalodes*, *Leersia hexandra* and *Isachne glebosa* were preferred for oviposition (Catindig *et al.*, 1994).

The present project was undertaken to screen the plants mostly preferred by *M. separata* for a better understanding of management of the pest.

### MATERIALS AND METHODS

The experiment was carried out in the laboratories of Department of Agricultural Entomology, University of Agriculture, Faisalabad. Three alabaster papers (measuring 0.5 m x 0.5 m) were spread over the lab. tables to represent three replications using Completely Randomized Design for allotting the food plants at equidistance on these papers. All the plants were collected freshly from the fields and rice was collected from stray rice plants from Shahkot, 45 km from Faisalabad. 150 grams of leaves of each plant were washed with distilled water and kept under shade for one hour, which were then cut into small pieces and 10 grams leaves of each plant were then put on these papers. A group of thirty 4<sup>th</sup> instar larvae of *M. separata* were released in the center of a circle (10 in each circle) and were allowed to feed on the plant materials for twelve hour. The difference in attract ability of the plants was compared by using DMRT at 5% level of probability.

### RESULTS AND DISCUSSION

The results revealed (Table 1) significant difference in attract ability of plants for *M. separata* and none of the plant was completely neglected / rejected by the pest. Sugarcane, sorghum and maize had non-significant difference among them for attraction for *M. separata*, with mean per hour attract ability, respectively, were 2.04, 1.79 and 1.75. Onion and garlic were least preferred with mean attract ability per hour was 0.21 in each case. The attract ability in descending order was sugarcane > sorghum > maize

> khabbal > rice > gram > water grass > korbooti > potato > chulai > dib > makoh > okra > garlic > onion. Out of a set of 40 pearl millet landraces under choice and no-choice conditions to identify lines with resistance to *M. separata* showed that genotypes IP 6577, PIB 228, IP 6069, IP 6251, and IP 5836 were significantly less damaged than the susceptible check IP 3072. These lines can be used to develop cultivars with less susceptibility to *M. separata*. Most of the lines showing resistance to the Oriental armyworm originated from West Africa (Sharma and Sullivan, 2000).

**Table 1. Attract ability of different plants for larvae of *M separata***

Plants	Number of larvae attracted / hour	Percent attraction
Chulai	0.58 bcd	3.86
Dib	0.50 bcd	3.33
Garlic	0.21 d	1.40
Gram	0.87 bc	5.80
Khabbal	0.95 b	6.33
Korbooti	0.66 bcd	4.40
Okra	0.41 cd	2.73
Maize	1.75 a	11.66
Makoh	0.50 bcd	3.33
Onion	0.21 d	1.40
Potato	0.62 bcd	4.13
Rice	0.62 bc	4.13
Sorghum	1.79 a	11.93
Sugarcane	2.04 a	13.60
Water grass	0.83 bc	5.53

These results are in partial agreement with Singh and Rai (1989) and Catindig *et al.* (1994) who reported the preference of plants by *M. separata*. Linear laminae with multicostate parallel venations were mostly preferred. Bitter gourd, *Momordica charantia*, was less palatable to two species of armyworms, *Spodoptera litura* and *Pseudaletia separata*, than two other cucurbitaceous plants (Yasui *et al.*, 1998). The difference in feeding response of the two armyworms to momordicine II may be related to the diversity in their host range.

The host range also affected the parasitism of *M. separata* (Sharma *et al.*, 2004). The trend of parasitization by wasps *Cotesia kariyai* was corn > kidney bean > japanese radish (Fujiwara *et al.*, 2000). Adult male and female of the tachinid fly, *Drino inconspicuides* had different life cycle parameters on host *Mythimna separata* (Kalyebi and Nakamura, 2006). The trend of parasitization by wasps *Cotesia kariyai* was corn > kidney bean > japanese radish (Fujiwara *et al.*, 2000). Influence of weeding regimes and pearl millet genotypes on parasitism of the Oriental Armyworm, *Mythimna separata* was studied and effect of host was found highly correlative (Sharma *et al.*, 2002).

Based on the foregoing discussion, it can be stated that there are possibilities for reducing armyworm damage through development and use of host with resistance to this pest in the management program. Making a distinction between the roles of host plants and nectar plants helps us to understand the apparently cyclic nature of the outbreaks of *M. separata* (Wang *et al.*, 2006). Sorghum and Khabbal grass proved potential alternate hosts plants, which may be grown as trap crop to save her economically important cash crops of the season.

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