

Prey preference of orthopteran predators on rice insect pests

N. CHITRA*, K. GUNATHILAGARAJ AND R. P. SOUNDARARAJAN

Department of Agricultural Entomology
Tamil Nadu Agricultural University
Coimbatore 641 003, Tamil Nadu, India

ABSTRACT: The predatory potential of the orthopteran predators viz., *Conocephalus longipennis* (de Haan), *C. maculatus* Le Guillou, *Anaxipha longipennis* Serv. and *Metioche vittaticollis* (Stal) against the eggs of rice insect pests was studied under laboratory conditions. *M. vittaticollis* proved to be an effective predator on the eggs of rice leaf folders (*Cnaphalocrocis medinalis* (Guenee) and *Marasmia patnalis* (Bradley) and rice moth, *Corcyra cephalonica* (Stainton), while *C. longipennis* and *C. maculatus* fed voraciously on the eggs of rice stem borer (*Scirpophaga incertulas* Walker) and rice earhead bug, *Leptocorisa acuta* (Thunberg). *M. vittaticollis* did not feed on stem borer eggs while *C. longipennis* and *C. maculatus* did not prefer to feed on leaf folder eggs. *A. longipennis* fed on all the eggs tested along with rice leaves but never on *Corcyra* eggs.

KEY WORDS: Egg predators, orthopteran, rice insects

There is a large complex of natural enemies of rice insect pests in tropical Asia. Amongst them; the predators play a vital role in suppressing the pest population. The orthopteran predators have received little attention in the past. Chitra *et al.* (2000) have recorded *Conocephalus longipennis* (de Haan), *Conocephalus maculatus* Le Guillou (Tettigoniidae), *Anaxipha longipennis* Serv. and *Metioche vittaticollis* (Stål) as the commonly encountered predators in the rice fields of Coimbatore, Tamil Nadu. The predatory potential of the above mentioned orthopteran predators has been studied elsewhere but no reports are available in India. Hence, this study was taken up to assess the predatory potential of the orthopteran predators on eggs of rice insect pests.

MATERIALS AND METHODS

Leaf folders and *Corcyra cephalonica* (Stainton) to be used as prey were mass cultured following the standard methods. The egg masses of *Leptocorisa acuta* (Thunberg) and *Scirpophaga incertulas* (Walker) collected from the field were used for the experiment. The predators viz., *A. longipennis*, *C. longipennis*, *C. maculatus* and *M. vittaticollis* were reared on a diet of milk powder and dried fish powder in the ratio of 1:1. For *A. longipennis*, the diet was supplemented with rice leaves also. Twenty eggs each of *Cnaphalocrocis medinalis*, *C. cephalonica*, *Marasmia patnalis*, *L. acuta* and 20 egg masses of *S. incertulas* laid on leaves were placed in Petri-dishes (9.5x1.5cm) lined

*Agricultural Research Station, Ramanathapuram 623 501, Tamil Nadu

with moistened cotton and filter paper. Except the eggs of *C. cephalonica* all the other insect eggs were with the leaf tissue. The pre-starved 10-day-old adults of *A. longipennis*, *C. longipennis*, *C. maculatus* and *M. vittaticollis* were introduced @ one per Petri-dish. The number of eggs consumed after 24 hours was determined. The experiment was replicated three times in randomized block design (Kraker, 1996).

RESULTS AND DISCUSSION

The predatory potential of the orthopteran predators on the eggs of rice insect pests is furnished in Table 1. *A. longipennis* fed more on the eggs of *M. patnalis* (18.25 eggs) and *C. medinalis* (17.5 egg) than on those of *S. incertulas* (6 egg masses), *L. acuta* (3.5 eggs) and *C. cephalonica* (0.51 egg). As *A. longipennis* is basically a rice feeder, it must have consumed the eggs along with leaves inadvertently or to make up the protein requirements in the diet deliberately. Vasanth (1993) reported that the crickets prey on weaker victims that are unable to offer resistance and they will eat it with some plant materials. Except the eggs of *C. cephalonica*, the other insects eggs were offered with the leaf tissue. This explains the low consumption of *C. cephalonica* by *A.*

longipennis. Among the other insect eggs offered, *A. longipennis* preferred to feed more of *C. medinalis* and *M. patnalis* eggs. *A. longipennis* as an effective predator on the *C. medinalis* and *M. patnalis*, (Bandong and Litsinger, 1986; Canapi *et al.*, 1998) and of *L. acuta* and *S. incertulas* (Wongsiri *et al.*, 1980) has been reported earlier. The low intake of *L. acuta* and *S. incertulas* eggs by *A. longipennis* may be due to the hard chorion of *L. acuta* eggs and the large biomass of *S. incertulas* eggs resulting in early satiation.

Conocephalus longipennis predated more on *L. acuta* (10.75 eggs) and *S. incertulas* (5.75 egg masses) than on the eggs of other insects. The predation of *C. longipennis* on the eggs of *L. acuta* (Ito *et al.*, 1995) and *S. incertulas* (Pantua and Litsinger, 1984) has been reported earlier. The lesser preference to leaf folder eggs was observed by Kraker (1996). *C. maculatus* fed more on the eggs of *S. incertulas* (6.75 egg masses), *L. acuta* (6.25 eggs) and *C. cephalonica* (4.25 eggs) than on the eggs of leaf folders (1.25 to 1.75). Yasumatsu *et al.* (1980) reported that *C. maculatus* accepted leaf folder eggs in its diet. The preference for the eggs of *S. incertulas* and *L. acuta* by *C. longipennis* and *C. maculatus* may be related to the smaller size of the prey or their inability to locate leaf folder eggs.

Table 1. Predatory potential of Orthopteran predators on the eggs of rice insect pests

Host	No. of eggs consumed / predator / day *			
	<i>A. longipennis</i>	<i>C. longipennis</i>	<i>C. maculatus</i>	<i>M. vittaticollis</i>
<i>Cnaphalocrocis medinalis</i>	17.50 ^c (4.16)	1.00 ^a (1.18)	1.75 ^a (1.49)	20.00 ^c (4.53)
<i>Corcyra cephalonica</i>	0.51 ^a (0.44)	1.75 ^a (1.44)	4.25 ^a (2.17)	18.75 ^c (4.36)
<i>Leptocorisa acuta</i>	3.50 ^b (1.84)	10.75 ^c (3.34)	6.25 ^b (2.50)	8.75 ^b (3.03)
<i>Marasmia patnalis</i>	18.25 ^c (3.85)	1.25 ^a (1.31)	1.25 ^a (1.87)	20.00 ^c (4.53)
<i>Scirpophaga incertulas</i>	6.00 ^b (2.44)	5.75 ^b (2.49)	6.75 ^b (2.68)	0.00 ^a (0.71)
CD values (P=0.01)	4.64	2.92	3.87	2.19
(P=0.05)	3.31	2.08	2.76	1.56

* Mean of three replications

Figures in parentheses are \sqrt{x} transformed values.

Means in a column followed by a common letter are not significantly different at P < 0.05 level by DMRT.

There was cent per cent predation of leaf folder eggs by *M. vittaticollis*, followed by predation on *C. cephalonica* and *L. acuta*. The egg masses of *S. incertulas* were left untouched. Lack of predation of *S. incertulas* eggs could have been due to the presence of scales as Lee *et al.* (1997) reported that adults of *M. vittaticollis* fed on 256 eggs of striped stem borer *Chilo suppressalis* (Walk.) overnight whose eggs are devoid of scales. This lack of preference for *S. incertulas* by *M. vittaticollis* was earlier reported by Rubia *et al.* (1990). The higher predation of the eggs of leaf folders (Kraker, 1996) and lower preference for *L. acuta* eggs (Rubia and Shepard, 1987) by *M. vittaticollis* were also reported earlier. Field based studies on their predatory potential are required in the future.

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