RESEARCH NOTES

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Evaluation of Different Insect Eggs for Rearing of Egg parasite, *Telenomus remus* Nixon (Hymenoptera : Scelionidae)

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Telenomus remus Nixon is an important egg parasite of *Spodoptera litura* (F.) and *S. mauritia* Boisd. in Fiji (Lever, 1943). It was introduced into India from New Guinea in 1963 (Sankaran, 1974). The biology was studied by Gerling (1972) and Joshi *et al.* (1976). Krishnamoorthy and Mani (1985) reported 50 per cent parasitism on *S. litura* under field cage conditions. The present study was conducted to test *T. remus* against important pests in order to conduct further field trials and also to find an alternate laboratory host for continuous breeding in the laboratory.

T. remus is being continuously bred in our laboratory on *S. litura* eggs. The test insects used in the present study were collected from field. *Heliothis armigera* (Hbn.), *S. litura* and *S. exigua* (Hb.), *Galleria mellonella* (L.), *Sesamia inferens* Wlk., *Chilo auricilius* Dudgn., *Chilo partellus* Swin., *Crocidolomia binotalis* Z. and *Earias vittella* (F.) were reared on artificial diets, whereas *Tribolium castaneum* (Herbst.) on wheat flour, *Corcyra cephalonica* Stainton on sorghum grains, *Phthorimaea operculella* Zell. and *Agrotis segetum* (Schiff.) on potato, *Plusia signata* F. on chickpea, *Plutella xylostella* (Curtis) on cabbage and *Leucinodes orbonalis* Guen. on brinjal. Three hundred fresh eggs (about 6 h old) were exposed in the ratio of 1 : 2 (parasite:egg) for 24h to *T. remus* females in glass vials (20 x 3.5 cm) and each treatment was replicated 3 times. After exposure, the vials were observed in due course for parasite/host larval emergence. Whenever parasites were seen ovipositing in eggs but eggs did not hatch or yield parasites, such eggs were dissected out to find out the reason for non-emergence.

Longevity and fecundity tests were conducted wherever parasitism was obtained. Adults obtained from various insect eggs were exposed to *S. litura* eggs to see whether passing the culture through different eggs had any effect on the parasite. This was compared with adults obtained from *S. litura* eggs. Parasites were also exposed to eggs of the same host species to see whether subsequent exposure can improve parasitism.

Results of the host range test showed that besides *S. litura* which is the preferred host, *S. exigua* and *C. cephalonica* were also parasitised with 25.4 and 24.4% parasitism, respectively and 90 per cent emergence

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Table 1. Host preference, longevity, fecundity and sex-ratio of *Telenomus remus*.

Host species	% parasitism	% parasitism in F_1 generation	Longevity * (days) Male : Female	Sex-ratio* Male : Female	Fecundity
Corcyra cephalonica	24.4[b]	40.0[b]	7.2 : 14.0	1 : 0.86	135.6[c]
Plusia signata	10.9[c]	11.2[d]	7.0 : 12.4	1 : 0.89	100.8[d]
Spodoptera exigua	25.4[b]	23.8[c]	8.2 : 13.6	1 : 1.00	141.6[c]
Agrotis segetum	7.9[d]	6.8[d]	7.6 : 10 3	1 : 0.82	105.2[d]
Heliothis armigera	19.2[c]	20.1[c]	9.6 : 14.3	1 : 8.85	164.4[b]
Spodoptera litura	98.8[a]	98.4[a]	12 2 : 16.6	1 : 1.00	233.6[a]

Treatment means followed by same letter are not significantly different (P=0.05) by L. S. D.
* Differences between means not significant.

was obtained from these three hosts. Parasitism on *H. armigera*, *P. signata* and *A. segetum* was 19.2, 10.9 and 7.9%, respectively (Table 1) and 75% emergence was obtained on these three hosts. However, *T. remus* could not parasitise the eggs of *T. castaneum*, *G. mellonella*, *P. operculella*, *E. vittella*, *S. inferens*, *P. xylostella*, *C. auricilius*, *C. partellus*, *C.binotalis* and *L.orbonalis*. Wojcik *et al.* (1976) reported high parasitism and emergence from eggs of *Spodoptera* spp. Dass and Parshad (1984) reported differential preference for 8 species of hosts with high parasitism of 81.9% on *Agrotis spinifera* (Hb.) and 86.9% on *S. exigua*, suggesting utilisation of these two species for rearing *T. remus*. However, they failed to obtain any parasitism on *C. cephalonica*. Our studies suggest that by keeping parasite/egg ratio of 1:1, it was possible to obtain parasitism. Hence, *C. cephalonica* could be utilised as alternative laboratory host in the absence of *S. litura* as its rearing is easy and the insect is available throughout the year. Our studies corraborate the findings of Kumar *et al.* (1986), who obtained 90% parasitism on *C. cephalonica*. *P. signata* and *A. segetum* are new hosts recorded for *T. remus*. In *S. inferens* and *E. vittella*, the parasite was observed ovipositing but failed to develop. Only 30% of host larvae hatched. In the remaining eggs, neither host larvae nor dead parasite adults were observed. Probably, the host larvae could not develop due to pricking by the ovipositing parasites.

Longevity of adults obtained from parasitised hosts did not differ significantly (Table 1). Similarly, sex-ratio obtained on different host eggs was almost same. But fecundity of parasites obtained from different hosts when tested on *S. litura* eggs varied significantly with adults reared from *S. litura*. Parasites reared on *S. litura* eggs showed maximum fecundity. Hence, it may be concluded that parasites were found to be more active when obtained from

S. litura, *H. armigera*, *S. exigua* and *C. cephalonica* and could be bred in the laboratory on the three latter hosts when *S. litura* is not available. Exposure of F_1 generation of *T. remus* to the same host species did not enhance the rate of parasitism except in *C. cephalonica* in which subsequent exposure enhanced the rate of parasitism to 40% from 24.4%. This suggests that *C. cephalonica* which can be reared easily in the laboratory could be utilised for rearing *T. remus*.

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