Seasonal abundance of the whitebacked planthopper and brown planthopper and predators in insecticide-free rice fields in Malaysia

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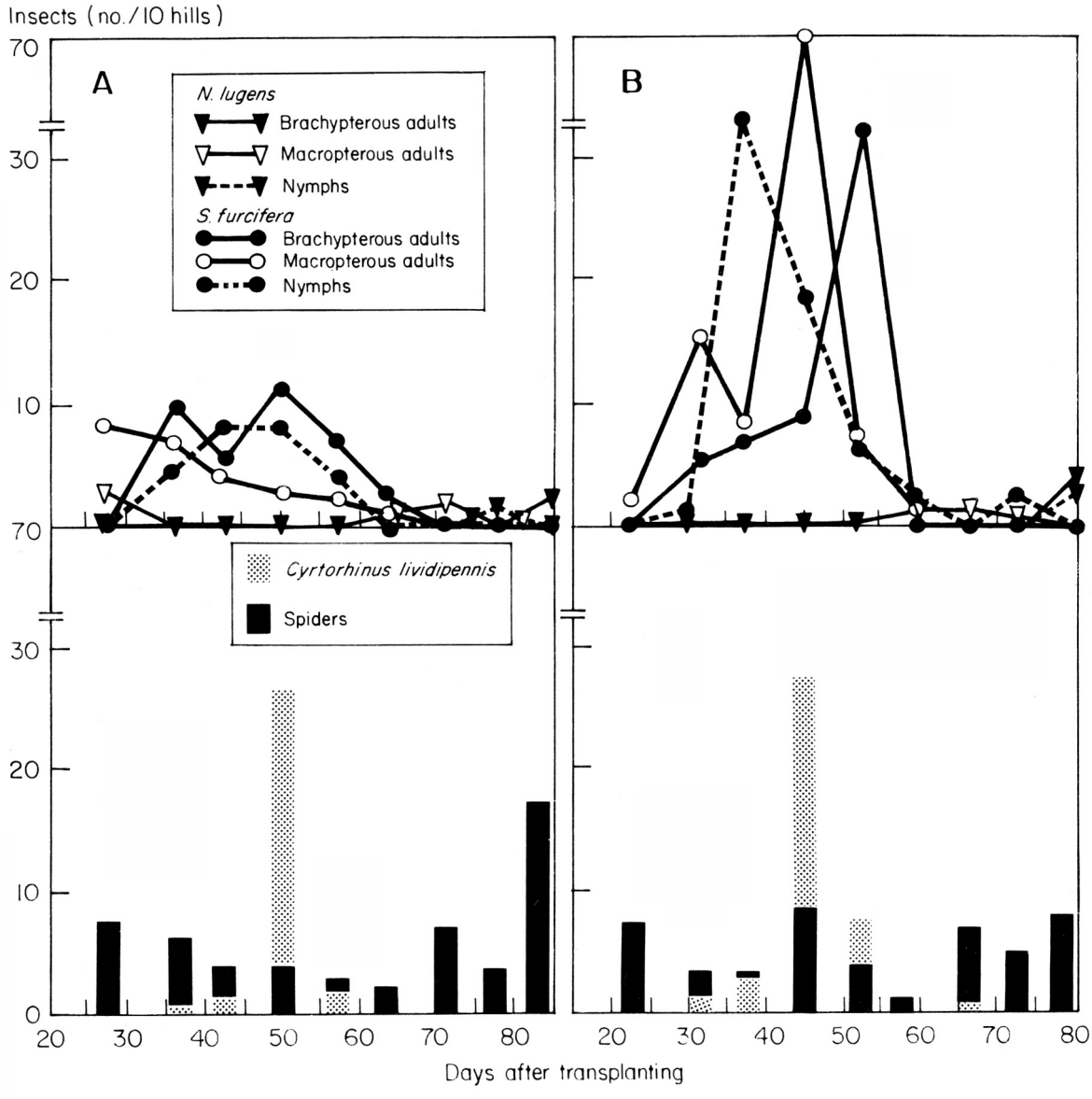
The large outbreak of the whitebacked planthopper (WBPH) *Sogatella furcifera* in the Muda Irrigation Scheme in June 1979 emphasizes the threat that both WBPH and brown planthopper (BPH) pose in Malaysia. WBPH has damaged paddy in Malaysia since 1925. Its frequent but innocuous position in the paddy ecosystem strongly suggests that it is controlled naturally except when some unknown factors trigger an outbreak.

To study this natural control, two 1-ha paddy fields in Telok Chengai were grown to the variety MR7, which is highly susceptible to BPH and WBPH. No insecticide treatment was used. Every week, samples from 20 hills/field were taken with a portable suction sampler. *Cyrtorhinus lividipennis, Paederus fuscipes, Casnoidea interstitialis,* and spiders were monitored together with WBPH and BPH at three growth stages. All of those predators fed on WBPH in the laboratory.

In one of the fields macropterous WBPH and BPH were found at 28 days transplanting (DT). But only WBPH were present from 36 DT to 65 DT (see figure, A). After 65 DT the WBPH population declined and low BPH population was observed in the ripening crop. The *C. lividipennis* population peaked at 50 DT, and declined as the WBPM population declined. The number of spiders declined initially but peaked toward the end of the season.

The buildup of *C. lividipennis* suggests that the mirid bug is important in maintaining a low WBPH population in the field. Spiders appear less effective but, unlike *C. lividipennis,* are always in the field and therefore are an important constant mortality factor in the paddy ecosystem. The populations of *P. fuscipes* and *C. interstitialis* were low.



Populations of *Sogatella furcifera, Nilaparvata lugens, Cyrtorhinus lividipennis,* and spiders in a field grown to brown planthopper-susceptible variety MR7 without insecticide treatment. Telok Chengai, Malaysia, 1979.

The insect populations in the other field were similar. But the level of WBPH was higher, about 10 WBPH/hill at 45 DT (see figure, B). That level is below the tentative economic threshold of 20/hill in the Muda Irrigation Scheme. Interestingly, only the two fields were untreated throughout the planting season. The surrounding 29 fields had more than 20 WBPH/hill and were subsequently sprayed. All of the affected fields were prophylactically treated with carbofuran granules at 30 DT. Such observations highlight the need for an integrated pest control approach in Malaysia. ■

Egg parasitism of *Tryporyzo innotata* (98% by *Telenomus rowani).* The wet season experimental crops are sown early in December. Ord River, Australia, 1978–79.

Date	Eggs (no.)	Parasitism (%)
10 Jan 1978	5141	43
20 Jan	1628	57
25 Jan	600	94
13 Feb	991	61
22 Feb	1239	57
2 Mar	1561	80
27 Dec 1978	353	0
4 Jan 1979	447	0
10 Jan	643	0
1 Feb	438	15
7 Feb	1248	31
12 Feb	2782	20
15 Feb	836	36
22 Feb	3014	71
2 Mar	1051	55
14 Mar	1648	67
23 Mar	214	80
29 Mar	776	55
11 Apr	1485	71

Pest occurrence on split transplanted rice

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In West Bengal, split transplanting or clonal propagation of rice is practiced mostly in flood-prone areas where farmers generally face a shortage of seedlings after the floodwater recedes.

A preliminary investigation conducted at Pandua, a gall-midge endemic area, studied the effect of split transplanting on pest incidence in wetland rice. Thirty-day-old seedlings of Pankaj, an aman rice, were transplanted in the main field (T_1). The rooting tillers of Pankaj were split and transplanted in another field 20 days later (T_2). Subsequently two other fields were transplanted with 40- and 60-day-old tillers (T_3 and T_4), split from the first transplanted field. The spacing was 20 × 15 cm; 3 seedlings/hill were transplanted. The fertilizer dose was 75-25-25 kg NPK/ha. The field was 100 m^2 and the water level was maintained at 5-7 cm during the vegetative stage. No pesticide was applied. Split transplanting of seedlings 20 days after the first transplanting was the best treatment (see table). ■

Effect of split transplanting on blast disease incidence and gall midge infestation. Hooghly, India.

Split-transplant treatment	Tillers (no./m^2)	Blast infection in leaves (%)	Silver shoots (no./m^2)	Earhead lengths (cm)	Fertile grains/ earhead[a] (no.)	Yield/ 100 m^2
T_1 (control)	373	5	32	23.3	96.65	5.4
T_2 (20-day)	360	1	9	22.3	106.0	5.6
T_3 (40-day)	164	1	5	8.4	80.6	3.8
T_4 (60-day)	119	1	5	8.1	72.0	3.0

[a]Mean of 20 earheads.

Rice insects and their management in the Ord river irrigation area of Western Australia

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Both a wet and a dry season crop of rice are grown on the Ord, where rice production is still being developed. Rice is grown on about 400 ha each season. The rice pest complex in the two seasons differs; infestations are more severe in the wet season crops.

The rice white stem borer *Tryporyza innotata* is the most consistent and the most damaging insect in the wet season. Its natural control agents are being studied; the major ones are the egg parasite *Telenomus rowani* (see table) and the late larval parasite *Temelucha* sp., which cause roughly 40% parasitism over the season. *Bracon* sp., a parasite of early larval instars, is found, but usually in low abundance.

Other research is conducted on insecticide screening and time-of-application trials. seasonal abundance of moths for predictive insecticide application in commercial crops (granular lindane is used), and plant varietal resistance to stem borers. The armyworm *Pseudaletia separata,* a serious rice pest in the panicle development-maturity stage, causes grain to fall. Other pests include the grain-sucking bug *Eysarcoris trimaculatus* and locusts (chiefly *Gastrimargus musicus, Locusta migratoria,* and *Austracris guttulosa*).

Dry season rice crops are attacked by *P. separata* and *E. trimaculatus,* but not as severely as the wet season crops. Rice bloodworms Chironomidae occasionally attack aerially sown, dry season crops.

Leafhoppers are found in Ord rice crops but so far have not caused damage nor transmitted serious diseases. ■

Influence of nitrogen levels on rice hispa incidence

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In a field trial during 1978 kharif, the infestation by rice hispa *Didadispa armigera* increased with an increase in nitrogen level from 0 to 120 kg/ha. At 150 kg N/ha, however, infestation decreased considerably. The mean numbers of hispa-damaged leaves/l0 hills at 0, 30, 60, 90, 120, and 150 kg N/ha were 67, 90, 115, 145, 171, and 128, respectively.

The decrease in rice hispa incidence