


Natural parasitism of *Telenomus* on eggs of the stink bug *Oebalus insularis* in Mexico

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In Campeche, where rice is rainfed, one of the most important pests is the stink bug *Oebalus insularis*. The bug's eggs are parasitized by the Scelionid *Telenomus* sp. On a total of 63,527 eggs collected during the rice-growing seasons of 1975, 1976, and 1977, parasitism averaged 65.5%. 

Paradosa annandalei, a predatory spider of the brown planthopper


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The brown planthopper (BPH) *Nilaparvata lugens* has become a major pest in the intensive rice-growing areas of India in recent years. In the rabi (dry-season) crop of 1977, three species of predatory spiders were highly active in keeping the BPH under check at the Rice Research Unit, Bapatla.

Interestingly, the predators preyed in different vertical zones of the rice crop, thereby facilitating coordinated pest control. *Paradosa annandalei* was observed preying on BPH for the first time. It was active at the base of the rice clump, where BPH population was high. The two other spiders, *Agriope pulchelle* and *Tetragnatha sutherlandi*, were in webs at the top of the plant where they preyed on all insects, including BPH, that were caught in the webs.


To study their feeding potential, individual adult spiders of each of the three species were kept in 15- × 2.5-cm test tubes. Nine replicates were maintained for each species. Thirty BPH adults were released daily into each tube to determine the daily feeding capacity of each species. Hoppers remaining in each tube were counted after 24 hours.

Paradosa annandalei consumed an average of 18 adult hoppers/day; *A.*

pulchelle, 16/day; and *T. sutherlandi*, 14/day. IRRI reported in 1974 that over a 3-day period a single predatory spider of *Lycosa pseudoannulata* killed about 25 BPH nymphs/day, or about 15 adults/day in a cage with 100 BPH. 

Brown planthoppers in West Bengal, India

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Although the brown planthopper (BPH) was observed in rice in West Bengal as early as 1968, it was first noted in serious proportions in a small area of Hoogly district in 1973. In 1975 2,000 ha in three districts were infested. In 1976, the total affected area in another district was 100 ha. In 1977, more than 4,000 ha in 6 districts were affected. Surveillance records showed that BPH was present in many other areas but that its population reached an economic injury level only under certain agroecological conditions, particularly in areas where the land was flooded, densely cropped, sprayed with contact insecticide in the early vegetative phase, etc. At the grain-filling stage summer (boro) rice was more prone to pest damage than winter (kharif) rice. Macropterous forms were prevalent in seedbeds where large numbers of mirid predators and many spider species were also found. Records over 5 years indicate that BPH infestations assumed alarming dimensions during alternate years, and that it was steadily spreading to new localities. 

The rice leaf roller in the Solomon Islands

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
The leaf roller *Susumia exigua* has always been a pest of rice in the Solomon Islands. When dryland rice was grown, the pest was considered less important than the armyworm. When irrigated rice began to be grown, the brown planthopper overshadowed the leaf roller, but when IRRI rice varieties began

to be grown exclusively, the leaf roller's importance increased. In 1975, more than 50% of the leaves in some fields were rolled.

In 1977, the leaf roller became the most serious rice pest in the Solomon Islands. Every field was attacked; often 100% of the leaves were rolled. The first attack came within 20 days of rice germination. The first generation with a 30-day life cycle was followed by a second that also attacked plants in all fields, especially their flag leaves. The effects of the first generation are not known, but heavy flag leaf attacks lowered yields by 10%.

Leaf roller is easily controlled by insecticide spraying. Many insecticides are suitable, but Orthene is favored. Gamma BHC and parathion are also highly effective. However, leaf roller control has given rise to the bigger problem of brown planthopper resurgence. Spraying the leaf roller to prevent flag leaf attack at the heading stage often leads to a large buildup of brown planthoppers that migrate to other crops after harvest.

Another leaf roller, *Cnaphalocrosis medinalis*, also occurs in the Solomons but is less abundant than *S. exigua*. A braconid parasite of the larva has been found, but less than 1% parasitism occurs. A chalcid parasite of the pupal stage has also been found. Its degree of parasitism appears to be about 5%. No varietal resistance has been observed.

We are studying the effect of each of the two generations of leaf roller on rice yields. Various insecticides, including the bacteria *Bacillus thuringiensis* are being evaluated to determine their efficiency in leaf roller control and their effect on the brown planthopper and its predators. 

Paddy water application of carbofuran for stem borer control

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Carbofuran 3% G at treatment levels of 0.5, 1.0, and 2.0 kg a.i./ha was broadcast