Crop losses due to hispa beetle damage in deepwater rice (DWR)

Z. Islam, Deepwater Rice Project, Bangladesh Rice Research Institute (BRRI), Gazipur, Bangladesh

We investigated the effects of severe hispa beetle *Dicladispa armigera* (Olivier) infestation on DWR in a pot experiment in water-controlled metal tanks in 1988. Experimental treatments were hispa attack at maximum tillering, attack at elongation, and no attack. The experiment was laid out in a completely randomized block design with seven replications. Water in the tanks was raised at 5 cm every 2 d to a maximum 70 cm.

Severe adult hispa beetle attack at maximum tillering followed by a gradual rise of water significantly reduced stem numbers 50% and panicle density 64% (see table).

Effects of *Dicladispa armigera* adult hispa beetle on potted DWR variety Chamara grown in metal tanks with gradually increasing water depth.[a] BRRI, Gazipur, Bangladesh, 1988.

Stage of hispa attack	Stem density (no./pot)		Panicle density (no./pot)	Panicle wt (g)	Grain yield (g/pot)	Yield loss (%)
	Maximum tillering	Early elongation				
Maximum tillering	19.9 a	13.4 b	6.4 b	2.9 a	18.9 b	52.4
Elongation	20.9 a	26.9 a	16.9 a	1.4 c	24.9 ab	37.3
Undamaged control	20.0 a	27.0 a	16.0 a	2.1 b	39.7 a	-
Level of significance (%)	ns	1.0	1.0	1.0	ns	
CV (%)	11.2	21.3	48.0	28.8	57.6	

[a] In a column, means followed by a common letter are not significantly different at the 5% level by DMRT.

Damaged plants compensated to some extent by producing heavier panicles, but grain yield was still 52% lower than undamaged control.

Damage at stem elongation did not reduce panicle density hut reduce panicle weight 33%. Grain yield was 37% lower than in the control.

These preliminary results demonstrated the potential effects of hispa beetle on DWR yields. Indications are that early damage is more detrimental than late damage and that flooding increases losses of hispa-damaged stems. □

Predation of wolf spider on mirid bug and brown planthopper (BPH)

K. L. Heong, Entomology Department, IRRI; S. Bleih, Rice Research and Training Center, Sakha, Kafr-Elsheikh, Egypt; and E. Rubia, Entomology Department, IRRI

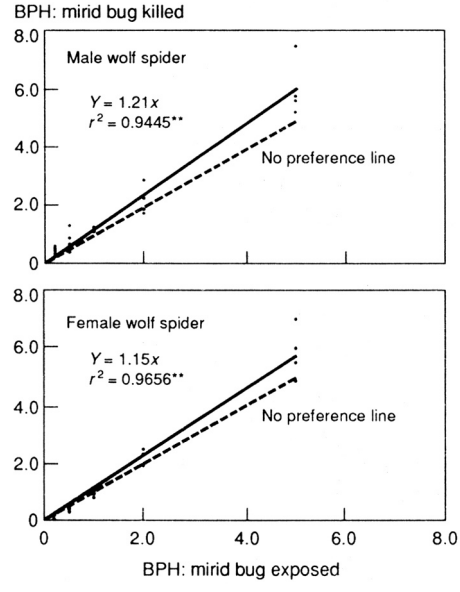
Wolf spiders *Lycosa pseudoannulata* (Boes et Strand) are polyphagous predators. They feed on pests such as planthoppers and leafhoppers, but they also prey on other beneficial species in the rice ecosystem, such as mirid bug *Cyrtorhinus lividipennis* and hymenopteran parasitoids. Mirid bugs feed on hopper eggs and nymphs.

When the wolf spider is exposed to both hoppers and mirid bugs, which will it prefer?

We evaluated predation of *L. pseudoannulata* attacking *C. lividipennis* in functional response experiments in the insectary. Adult spiders were caged individually with different densities of 3d and 4th instars and adults of mirid bugs. Each prey density was replicated four times. Mortality was recorded after 21 h. Data were fitted into Royama's random predator equation, and searching efficiency and handling time estimated using nonlinear least squares technique. Handling time is when the predator is not searching (i.e., resting, grooming, pursuing).

Both male and female spiders attacked all stages of mirid bugs equally. An adult spider could consume as many as 22 mirids a day. This implies that wolf spiders can have negative impact on hopper control, since they can consume beneficial mirids as well as hoppers.

Evidence of preference may be shown experimentally by analyzing the deviation of the proportion of one prey type attacked from the proportion available in the environment. We exposed male and female adult spiders to different ratios of mirid bug and BPH adults. Mortality was recorded after 24 h and the ratios calculated. The ratios of BPH and mirid bug killed were plotted against the ratios of initial prey numbers exposed (see figure). Preference can be detected and tested as a deviation from the slope of unity passing through the origin.



Predation by wolf spider *L. pseudoannulata* when presented with BPH and mirid bug adults.

Both male and female *L. pseudoannulata* showed significant preference for BPH. This could be due to differences in inherent searching efficiencies for the two prey or to changes in behavior when two prey types are encountered. □