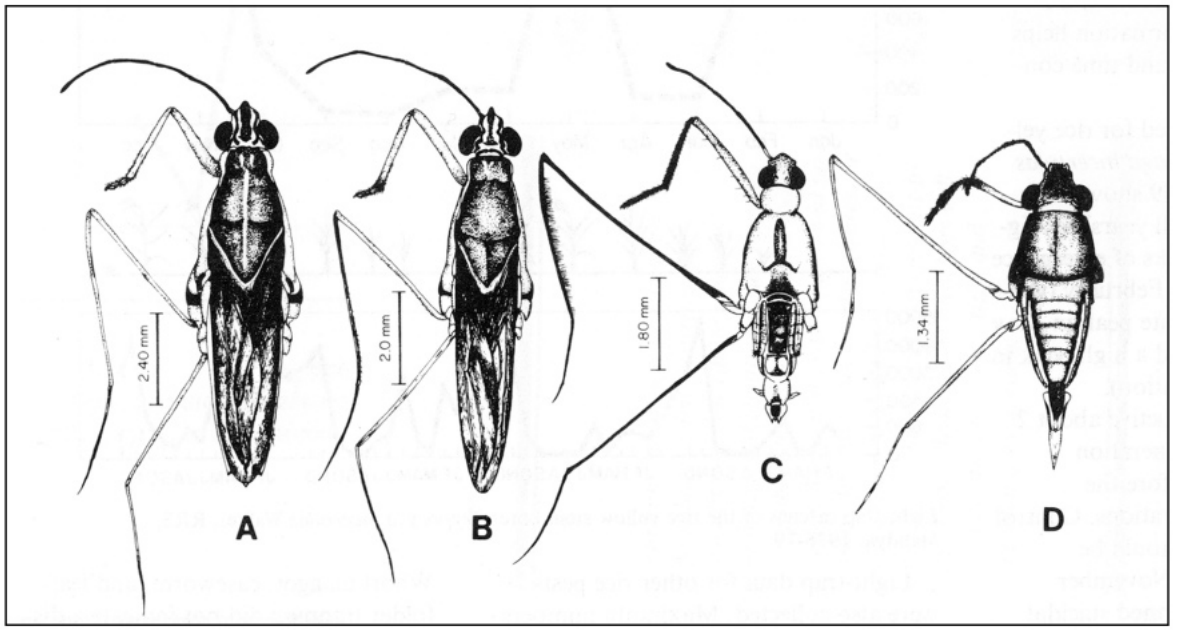
booting stage tillers were dissected, maggots were observed to be feeding on spikelets (see figure). After emergence the affected panicles showed damage (shriveled spikelets) caused by the pest.

Whorl maggot damage to Jaya variety, under different protection treatments, during three consecutive seasons is presented in the table. Damaged leaves in the vegetative stage (20 to 40 days after transplanting (DT) ranged from 8.3-26% in unprotected treatments. During 1980 rabi, 1.6-4.4% tillers with boot leaf damage were observed at 80 DT in different treatments. In affected boots 4.5-8.1% spikelets per panicle were injured. Damage in emerged panicles at 93 DT ranged from 3.3 to 5.8%. Insecticidal treatments at 10-day intervals reduced late damage symptoms more than other treatments.

Water striders: new predators of rice leafhoppers and planthoppers in the Phillippines

Alberto T. Barrion, research assistant, and James A. Litsinger, entomologist, Entomology, Department, IRRI

A 1981 survey of the rice field aquatic habitat on the IRRI farm revealed four species of water striders (Hemiptera: Gerridae) (see figure and table). Field and laboratory observations showed these water striders preyed on leafhoppers (*Nephotettix virescens, N. nigropictus, Cofana spectra, Recilia dorsalis,* and *Exitianus indicus*) and planthoppers (*Nilaparvata lugens, Sogatella, furcifera, Sogatodes pusanus,* and *Harmalia* sp.) that fell on the water.



Adult water striders *Limnogonus fossarum* (A, female), *L. nitidus* (B, female), *Rheumatogonus* sp. (C, male), and *Rhagadotarsus* sp. (D, female).

Characters of rice field-inhabiting gerrids, IRRI 1981.

Character	*Limnogonus*		*Rheumatogonus* sp.	*Rhagadotarsus* sp.
	Fossarum (F.)	*Nitidus* (Mayr)		
Total body length (mm)				
Male	8.88	8.16	5.66	No male insect collected
Female	10.88	9.0	7.33	4.83
Body appearance	Long and slender	Long and slender	Slightly shorter and thinner	Short to slightly oval
Length of middle and hind femora compared to body length	Shorter	Shorter	Longer	Shorter
Inner margin of eyes		Concave	Concave	Convex
Posterior lobe of pronotum	With yellow longitudinal band	Without band	Without band	Without band
Posterior 2/3 of middle tibia	Without thick hairs	Without thick hairs	With thick hairs	Without thick hairs
Shape of posterior end of abdomen	Bluntly pointed	Bluntly pointed	Blunt to slightly pointed	Pointed or spinelike

Water striders are fast moving. They are not usually seen in rice fields because they sense any water disturbance and are quick to flee. Water striders require constant water supply and are numerous in paddies irrigated from rivers or reservoirs.

Species of the genus *Limnogonus* are most numerous on the IRRI farm, which is irrigated from reservoirs year-round.

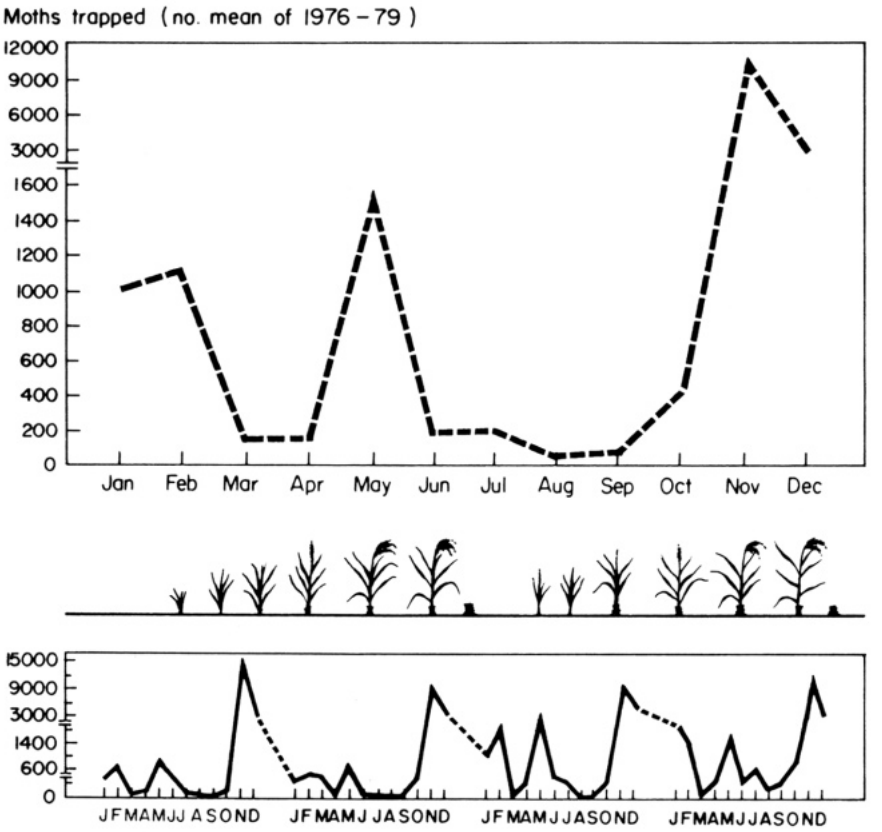
Light-trap catches of rice yellow stem borer

T. M. Manjunath, University of Agricultural Sciences Regional Research Station (RRS), V. C. Farm, Mandya 571 405, Karnataka. India

Light-trap catches at RRS, V. C. Farm, Mandya, indicate that seasonal appearance and population fluctuations of some important rice pests follow an annual pattern. This information helps forecast pest occurrence and time control measures.

Light-trap data collected for rice yellow stem borer *Scirpophaga incertulas* Walker from 1976 to 1979 show moth emergence is similar in all years (see figure). There are three peaks of emergence each year: a low peak in February (winter generation), a moderate peak in May (summer generation), and a high peak in November (kharif generation).

The pest is most destructive about 2 weeks after the winter generation emerges and a month before the summer and kharif generations. Control measures, if necessary, should be initiated then. May and November appearances might be termed suicidal emergence, as there is little standing rice to support progenies of large populations.



Light-trap catches of the rice yellow stem borer *Tryporyza incertulas* Walker, RRS, Mandya, 1976-79.

Light-trap data for other rice pests were also collected. Maximum numbers of leafhoppers, planthoppers (including brown planthopper), and gall midge were trapped in May and November. Whorl maggot, caseworm, and leaffolder trapping did not indicate a distinct trend. Maximum catch of most important rice pests in this area was in November.

Bionomics of the rice water weevil *Lissorhoptrus brevirostris* (SFFR.) in Cuba

Rafael M. Carbonnel, Rice Experimental Station "Sur del Jibaro," Sancti-Spiritus, Cuba

The rice water weevil, first reported in 1950, is a principal insect pest of rice in Cuba. Adults also feed on 34 alternate host plants, but complete development from egg to adult occurs on graminaceous species.

The life cycle from oviposition to emergence of adult is 50 days at a mean temperature of 26.2° C. In controlled conditions, adults live an average of 714 days.

In direct field counts adults appeared in mid-March. Highest population densities of adults, larvae, and pupae occurred between May and October, when average temperatures were 20° - 27.5° C and rainfall was higher than 100 mm. Population densities of adults, larvae, and pupae are highly correlated with mean temperature (r = 0.93, 0.99, and 0.81, respectively). Light-trap data confirmed that adults appeared between May and October. Two peaks, in June and September, are considered two generations. The correlation between adult populations and mean temperatures in the Sancti-Spiritus rice zone was 0.80.

Although adults feed on rice leaves, injury is not economically important because, even at the highest populations, they do not remove more than 1.4% of the foliar area. Larvae cause much greater damage, destroying up to 83% of root tissue and causing 54% yield loss.

In plots where different damage intensities of larvae were simulated (15% to 60% root tissue), yield reductions obtained were 37.3% to 61.1%.