Virus recovery from tungro-susceptible *Oryza* spp. Cuttack. India

Oryza spp.	% viruliferous insects					
	Days after inoculation					
	15	30	45	60	75	90
O. australiensis	0.0	6.7	10.0	0.0	0.0	0.0
O. harthii	8.3	10.0	20.0	50.0	35.0	14.3
O. brachyantha	0.0	1.6	0.0	0.0	0.0	0.0
O. eichingeri	0.0	0.0	0.0	13.8	5.2	0.0
O. glaberrima	43.5	61.9	66.7	54.5	79.3	38.9
O. nivara	55.0	33.3	46.1	65.4	39.1	60.0
O. perennis	0.0	6.6	0.0	0.0	0.0	0.0
O. punctata	0.0	11.1	0.0	0.0	0.0	0.0
O. sativa	73.1	68.2	63.3	71.4	47.4	53.3

survival and propagation of tungro virus in the semidwarfs, their stubble, and in wild rice. Some weed hosts such as *E. colonum* might also act as link hosts between two crops, especially in places where a single crop is grown per year.

Although both species of tungro vectors are found together in the paddy ecosystem, they differ in preference for survival and multiplication. It has been found that rice is a preferred host for *N. virescens* over weeds, whereas *N. nigropictus* prefers weeds (e.g. *L. hexandra)* to rice. Thus, in areas where cropping systems overlap, *N. virescens* might be playing a greater role in tungro perpetuation. In single cropping areas, *N. nigropictus* might transmit tungro virus among weeds or wild rices during the off-season. ■

Rice wilted stunt in Taiwan

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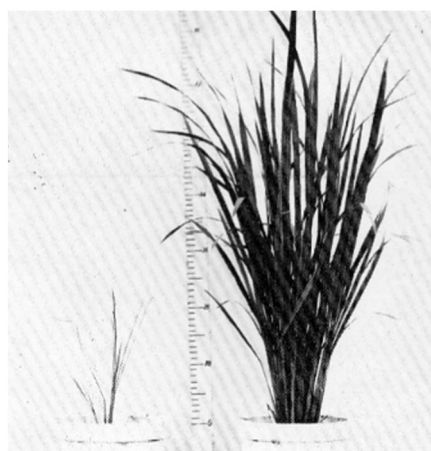
A rice disease characterized by extreme plant stunting, narrow leaves, and, often. premature death of infected plants was first found in paddy fields of Tungshih, central Taiwan in 1977 (see photo). Leaf wilting usually occurred first in the outer, older, leaves, and gradually proceeded to the upper leaves, resulting in plant death at later tillering stages. The disease was transmissible by the brown planthopper *Nilaparvata lugens,* the vector of rice grassy stunt and rice ragged stunt. The frequently lethal symptoms appear to distinguish the disease from grassy stunt and ragged stunt. The disease was named rice wilted stunt and is possibly a new virus disease of rice (see photo).

In greenhouse tests, seedlings of Tainan 5, a japonica, produced rusty yellowish leaves at about 10 days after inoculation. Young leaves twisted and turned pale green. Because the diseased plants seemed weak and usually had fewer tillers than normal, they appear similar to plants infected with rice transitory yellowing virus. Yield losses for Tainan 5 were 95, 78, 73, 65, and 40% when the disease symptoms were first expressed at 21-30, 3 1-40, 41-50, 51-60, and 61-70 days after transplanting. The yield reduction was 97, 82, and 77% for Taichung sen 3, an indica, when the symptoms were first expressed at 21-30, 31-40, and 41-50 days after transplanting. Infection at younger stages of rice growth resulted in complete yield loss.



Rice wilted stunt on Taichung Sen 3. Healthy (right) and infected (left) plants, 60 days after inoculation.

The brown planthopper transmitted the disease with a latent period of 7 days (range, 3-14 days) at 28-30° C, and infectivity persisted throughout the insects' life. The active transmitters ranged from 22 to 64%. The shortest acquisition access time was 2 hours and the shortest inoculation access time was 30 minutes. Among other Homopteran rice pests so far tested, none transmitted the disease. The disease was not transmitted through rice seeds or by mechanical means. ■

Food web of the rice brown planthopper in the Philippines

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The natural enemy relationships (food web) for the brown planthopper *Nilaparvata lugens* (BPH) were determined to learn more about the biological control possibilities against that pest. Records of predator-parasite relationships representing 74 taxa were determined over a 2-year period (1977-79) from 4 Philippine provinces representing different rice environments: Los Baños, Laguna (irrigated wetland); Tanauan, Batangas (dryland); Oton, Iloilo, and Manaoag, Pangasinan (rainfed wetland). Parasites were reared on BPH, and predator records of field observations or cage studies were obtained. Specimens were sent to taxonomists worldwide for species confirmation. A list of the specialists is available on request.

Five egg parasites belonging to Mymaridae and Trichogrammatidae were recorded (see figure). *Anagrus,* a mymarid species, was the most common. *Gonotocerus,* a mymarid egg parasite of BPH recorded elsewhere in Asia, is host to the green leafhopper *Nephotettix* spp. and was never reared from BPH eggs.