Sheath blotch of rice in Bangladesh

A. K. M. Shahjahan, H. U. Ahmed, and S. A. Miah, Bangladesh Rice Research institute (BRRI), Joydebpur, Dacca

A new disease symptom was observed on BR9 and other varieties in fields at BRRI farm in Joydebpur in July 1982. Outer leaf sheaths near the lower part of the stem showed brownish blotching or banding. The 5-cm band usually circled the entire sheath wrapping the culm. Outer leaves died. As plants matured black pycnidia with protruding ostioles and setae emerged from the sheath tissues. Similar symptoms were described as "sheath blotch" caused by *Pyrenochaeta oryzae* by Miyake (1910).

The fungus was isolated from diseased tissue and produced pycnidia and pycnidiospores in 15- to 20-day-old cultures. The fungus was *Pyrenochaeta* sp. To complete Koch's postulates, BR9 plants were inoculated at booting stage with the fungus. Blocks were attached to slightly wounded sheaths with scotch tape, and the whole plant was covered with a polyethylene bag for 3 days. Water-soaked lesions and brownish discoloration and banding similar to those found in the field were produced 7-10 days after inoculation (see figure). *Pyrenochaeta* sp. was also reisolated from the artificially inoculated plants, confirming the cause of the disease.

A survey was conducted on the BRRI farm to determine level of sheath blotch occurrence on different varieties. Of 178 entries examined, 152 were infected. The most susceptible were: BR9, BK194-1-2-1-3-2, BR593-647-25-2, BR1045-188-2-1, BKNFR76001-3-4-1-4-1, IR5, IR9288-B-B-B240-2, IR4744-295-2-3, IR9852-22-3, IR11297-158-1-1, IR13539-100-2-2-2-3, IR19661-131-1-3-1-3, IR5889-8-1-4-1-0, IR7732-1-198-RGA-BR(B)-B. IR9288-1-48-RGA-BR(B)-B, IR7732-1-87-RGA-BR(B)-B, DWCB-464-B, and DWCT134-3-1-5. □

Typical symptoms of sheath blotch of rice produced by artificial inoculation of BR9 with *Pyrenochaeta* sp.

Serological relations between rice grassy stunt and the unknown disease of rice transmitted by *Nilaparvata lugens* (Stål) in the Philippines

H. Hibino and P. Q. Cabauatan, IRRI

Serological tests were conducted to determine the relationship between the causal viruses of rice grassy stunt (GSV) and the unknown disease of rice transmitted by brown planthopper *N. lugens.* A latex agglutination test was made using an antiserum to GSV-associated filamentous particles prepared in Japan (1982).

Latex suspension (Difco Bacto Latex 0.81) was mixed with tris-HCl buffer containing antiserum at a 1/1,000 dilution and allowed to stand for 30 minutes. The coated latex suspension was washed and stored for use in the agglutination test. Sap of TN1 plants artificially infected with either the unknown disease or GSV was diluted 2 times. Diluted sap was mixed with the coated latex suspension and shaken for 30 minutes. Reaction was judged visually or under a light microscope based on clumping of latex particles. Positive reactions were obtained from sap of plants infected with the unknown disease up to 1 : 1280 dilution. The sap from GSV-infected plants gave positive reaction up to 1 : 5 120 (see table). Positive results were also obtained from the sap of 19 of 24 naturally infected plants showing tungro-like symptoms. Results indicate that the unknown virus and GSV in Japan and the Philippines is serologically related. The unknown virus is therefore identified as a strain of GSV because of their serological relationship and similarity in their symptomatology and virus-vector interactions. We propose that the new strain be designated as strain 2 (GSV-2) and the former type be designated strain 1 (GSV-1). □

Reaction of rice grassy stunt virus (GSV) and the unknown virus from the Philippines to GSV antiserum from Japan using the latex agglutination technique.

Source of	Reaction at given sap dilution									
infection	1:10	1:20	1:40	1:80	1:160	1:320	1:640	1:1280	1:2560	1:5120
GSV	+	+	+	+	+	+	+	+	+	+
Unknown virus	+	+	+	+	+	+	+	+	-	-
Virus-free	-	-	-	-	-	-	-	-	-	-

Unknown disease of rice transmitted by the brown planthopper in the Philippines

P. Q. Cabauatan and H. Hibino, IRRI

Rice plants with rice tungro virus-like (RTV) symptoms were observed at IRRI experimental farm (Laguna) and in Koronadal (South Cotabato). Infected plants showed stunting, leaf yellowing, and spreading growth. Symptoms varied according to variety and age of plant when infected. Leaves of some varieties were mottled or striped and had irregular rusty blotches. Plants infected at seedling stage showed profuse tillering similar to that caused by rice grassy stunt (GSV) and usually died prematurely. Plants infected at later stages developed symptoms indistinguishable from those caused by

RTV infection. Such symptoms were most common.

The disease is transmitted by brown planthopper *Nilaparvata lugens.* The incubation period of the causal agent in the insect was 5-21 days, usually 6-8 days. Five to 30% of the insects were active transmitters. The disease was not transmitted by sap, seeds, or soil or by 368 green leafhoppers *Nephotettix virescens* used to inoculate about 3,000 seedlings.

Disease symptoms were observed 7-14 days after inoculation of 7-day-old Taichung Native 1 (TNl) seedlings. Infected plants were yellow or pale yellow, even when fertilized adequately. TN1 plants infected at 2 months had RTV-like symptoms similar to those of naturally infected plants.

Although the unknown disease is similar to GSV, the two diseases differ: 1) the RTV-like symptom has never been described for GSV; 2) the disease is often lethal, particularly when plants are infected at early growth stages; and 3) *Oryza nivara,* the source of the resistance gene against GSV, is susceptible to the unknown disease (Table 1). Consequently, IR varieties with *O. nivara* genes for resistance to GSV are also susceptible (Table 2). These differences indicate the unknown disease may be a new virus disease or a strain of GSV. ☐

Table 1. Reaction of *Oryza nivara* to grassy stunt (GSV) and to the unknown disease, IRRI.

Trial	GSV			Unknown disease		
	Plants (no.)		Infection (%)	Plants (no.)		Infection (70)
	Inoculated	Infected		Inoculated	Infected	
I[a]	10	0	0	14	14	100
II[a]	11	0	0	11	9	82
III[b]	84	2	2.4	31	29	93.5

[a] Inoculated at 3 weeks old using 15–20 insects/seedling. [b] Inoculated using the mass screening method for GSV.

Table 2. Reaction of IR varieties to grassy stunt (GSV) and to the unknown disease, IRRI.

Variety	GSV[a]			Unknown disease[b]		
	Plants (no.)		Infection (%)	Plants (no.)		Infection (%)
	Inoculated	Infected		Inoculated	Infected	
IR28	380	127	33.4	83	72	86.8
IR29	183	48	26.2	73	66	90.4
IR30	309	81	26.2	77	64	83.1
IR32	548	156	28.5	87	78	89.7
IR34	489	101	20.7	65	59	90.8
IR36	4467	1546	34.6	97	87	89.7
IR38	367	73	19.9	75	65	86.7
IR40	308	57	18.5	58	49	84.5
IR42	4225	1363	32.3	191	183	95.8
IR43	203	37	18.2	64	53	82.8
IR44	388	72	18.6	94	81	86.2
IR45	175	16	9.1	85	82	96.5
IR46	587	114	19.4	87	78	89.7
IR48	342	35	10.2	77	67	87.0
IR50	560	91	16.3	92	81	88.0
IR52	264	27	10.2	75	69	92.0
IR54	41	3	7.3	72	69	95.8

[a] Combined data for GSV screening for 1980 and 1981. [b] Total of 2 trials (2 replications/trial).

Pest management and control INSECTS

Leaffolder outbreak in tarai belt of Nepal

S. B. Pradhan, assistant entomologist, and B. B. Shahi, rice coordinator, National Rice Improvement Program (NRIP), Parwanipur Agricultural Station, Birgunj, Nepal

The rice leaffolder *Cnaphalocrocis medinalis* Guenée has recently become a serious rice pest in Nepal. In 1977, it became epidemic in some tarai districts and in hilly areas. In 1978, leaffolder incidence was high at Janakpur, Bara, and Parsa, and in some hilly areas around Kathmandu Valley. In 1979-80, infestation was high in the first crop at the Parwanipur Station and in adjacent areas.

The insect first appears in May and stays until November. Its life cycle is generally completed within 25-30 days; cycles can be observed by the appearance of large moth populations at 1 -month intervals. In a rice season, 4-5 generations are comp1eted. A June 1980 field survey showed pest incidence in most of the tarai; “hot pockets” were Janakpur, Kankai, Bara, and Parsa. Leaffolder incidence was heavy at Hardinath Agricultural Farm and in surrounding areas in Janakpur where about two-thirds of the leaves in infested fields were folded. Most of the fields were totally white and papery because the chlorophyll of the rice plants was completely eaten off. In some fields about 90% of the leaves were folded.

Attack at early tillering stage was serious and the extent of the yield reduction it caused should be studied.

Brown planthopper resurgence on IR36 in Mindanao, Philippines

Cornelio A. Peralta, Wilfredo S. Fontanilla, and Lorenza S. Ferrer, Regional Crop Protection Center, Tacurong Sultan Kudarat, Philippines

During a baseline field trial for insect control recommendations in Sultan Kudarat Province, up to 5% brown planthopper (BPH) hopperburned hills