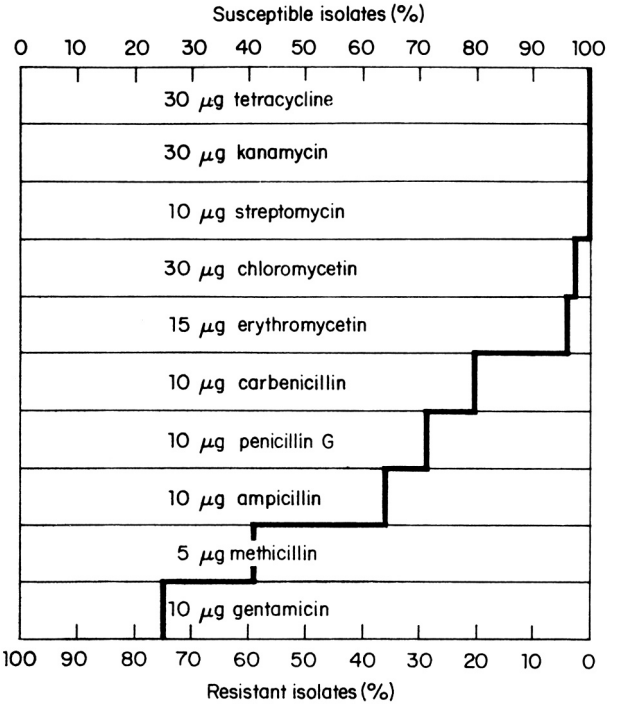
duction, and longer lesions (see figure) than avirulent isolate BLS37. BLS102 had an intermediate reaction. In all isolate-cultivar combinations, ooze production was directly related to lesion length, with longer lesions producing more ooze. However, the resistant cultivar had less ooze and shorter lesions than the susceptible.

Comparison of latent period, ooze production, and lesion length could be important factors contributing to variation in virulence of the isolates or components of BLS resistance. The latent period and ooze production might be used to compare virulence of different isolates on the same cultivar. □

Antibiotic sensitivity of *Xanthomonas campestris* pv. *oryzicola* in vitro

T. B. Adhikari and T. W. Mew, Plant Pathology Department, IRRI

Sensitivity to antibiotics among strains of phytopathogenic bacteria is well documented, but little information is available for *X. campestris* pv. *oryzicola,* the bacterial leaf streak pathogen. Such information is useful in grouping bacteria. We tested the sensitivity of *X. c.* pv. *oryzicola* isolates to 10 antibiotics: ampicillin (10 µg), carbenicillin (100 µg), chloromycetin (30 µg), erythromycin (15 µg), kanamycin (30 µg), gentamicin (10 µg), methicillin (5 µg), penicillin (G) (10 µg), streptomycin (10 µg), and tetracycline (30 µg). Disks containing the different antibiotics were placed on PSA medium. After 72 h of incubation at 28°C, an inhibition zone equal to or larger than 12 mm was regarded as a sensitive reaction.



Sensitivity and resistance of 44 isolates of *Xantomonas campestris* pv. *oryzicola* to antibiotics, IRRI.

All isolates were sensitive to 30 µg tetracycline, 30 µg kanamycin, and 10 µg streptomycin (see figure). Sensitivity to the other antibiotics varied. Seventy-five percent of the isolates were not sensitive to 10 µg gentamicin. □

Pest Control and Management

INSECTS

Parasitism of nematodes on three species of hopper pests of rice in Laguna, Philippines

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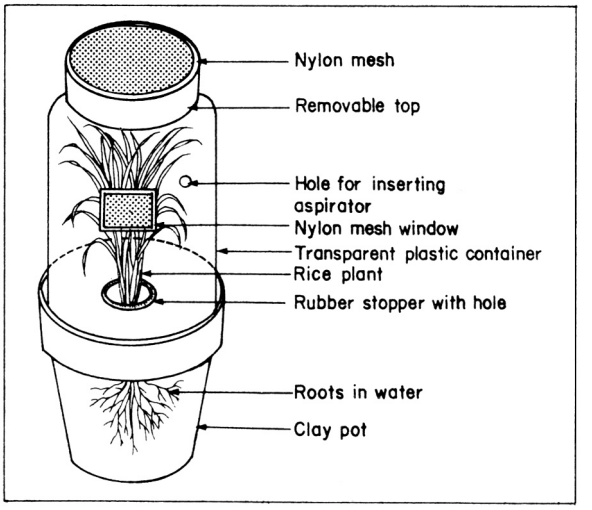
We determined the parasitism of nematodes on brown planthopper (BPH) *Nilaparvata lugens,* whitebacked planthopper (WBPH) *Sogatella furcifera,* and the green leafhopper (GLH) *Nephotettix* spp. by weekly sampling from rice fields Laguna, Philippines, 29 Jun-5 Oct 1982 (wet season).



1. Cage for rearing hoppers parasitized by nematodes.

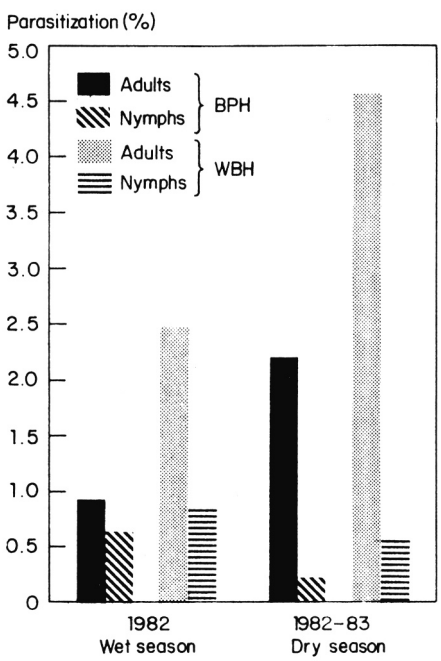
Samples from IR20 were taken with a D-Vac suction sampler. All hoppers were brought to the laboratory and caged (Fig. 1) until nematode parasites emerged. Three weeks later, all live insects were dissected.

During dry season (21 Dec 1982-15 Mar 1983), weekly sampling was carried out in the same area. Wet season (Jul-Nov 1983) sampling was conducted every 2 wk in Liliw, Kalayaan, Magdalena, Mabitac, Siniloan, Famy, Santa Maria, Victoria, Calauan, Parian, Pakil, and Cabuyao – all in Laguna.

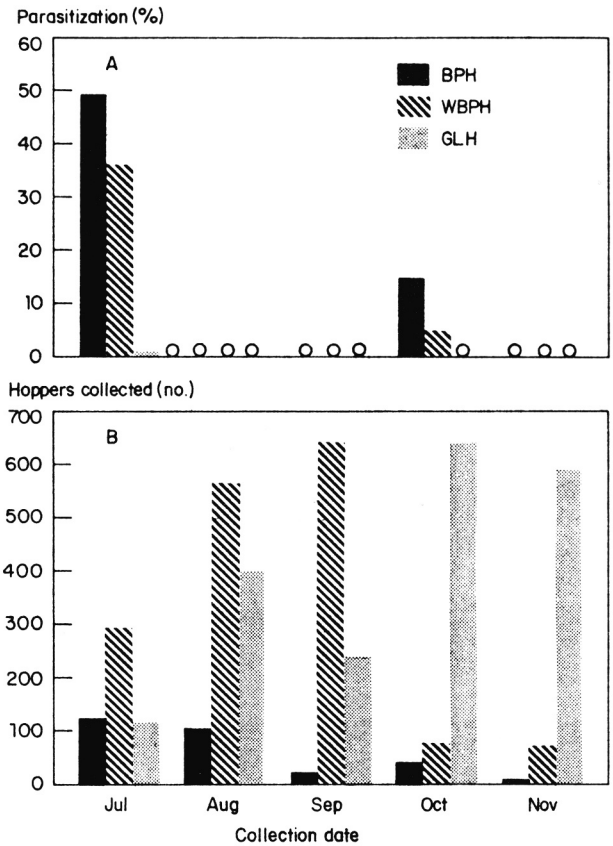
In 1982 wet season, parasitization of BPH or WBPH never exceeded 2.5% (Fig. 2). Parasitization was higher on adults than on nymphs.

Parasitism was slightly higher in 1982-83 dry season. More nematode parasites were found on WBPH (4.6%) than on BPH (2.5%) and adults were more frequently parasitized (Fig. 2).

In July 1983, average percent parasitization was almost 50% for BPH and 36% for WBPH (Fig. 3A). Parasitization of GLH was almost nil. No nematode parasites were found in Aug and Sep, but in Oct, BPH parasitization increased to 15% and that for WBPH to 4%. Seasonal population density of hoppers is in Figure 3B.



2. Nematode parasitization of BPH and WBPH during 2 cropping seasons. Liliw, Laguna, Philippines.



3. Nematode parasitization of hoppers (A) and hopper population and density (B) in Laguna, Philippines, 1983-84 wet season.

Parasitism of nematodes on BPH, WBPH, and GLH from different sites in Laguna, Philippines, 1983 wet season.

Site	BPH		WBPH		GLH	
	Total collected	Mean parasitism (%)	Total collected	Mean parasitism (%)	Total collected	Mean parasitism (%)
Liliw	73	53	201	33	92	1
Kalayaan	28	57	74	27	239	0
Magdalena	0	0	0	0	49	0
Mabitac	27	15	38	8	402	0
Siniloan	3	0	47	0	1414	0
Famy	11	0	71	0	144	0
Santa Maria	1	0	11	0	221	0
Victoria	67	0	9	0	31	0
Calauan	15	0	278	0	388	0
Parian	3	33	2	100	5	0
Pakil	24	38	49	20	10	0
Cabuyao	26	15	870	1	221	0
Total	278	$\bar{x}$ = 19.24	1650	$\bar{x}$ = 17.22	3216	$\bar{x}$ = 0

Parasitization of BPH, WBPH, and GLH by nematodes during the 1983 wet season in 12 sites is in the table. Parasitization varied at different sites, but BPH and GLH collected from Liliw and Kalayaan had consistently highest levels – 53% and 57%. Parasitization of WBPH also was generally higher at those sites. At five sites, we found no nematode parasites.

Parasitism of nematodes may regulate BPH and GLH populations in some areas, especially in wet season. It may be possible to establish nematodes in areas where they were not found. Although parasitization of WBPH sometimes reached 33%, this level may not have a significant impact of their populations.□