

イネ tungro と黄萎病の重複感染

誌名	日本植物病理學會報 = Annals of the Phytopathological Society of Japan
ISSN	00319473
著者	Basu, A.N. A. Ghosh, M. D. Mishra, F. R. Niazi, S. P. Raychaudhuri,
巻/号	40巻1号
掲載ページ	p. 67-69
発行年月	1974年1月

The Joint Infection of Rice Tungro and Yellow Dwarf

A. N. BASU*, A. GHOSH*, M. D. MISHRA*, F. R. NIAZI*,
and S. P. RAYCHAUDHURI*

イネ tungro と黄萎病の重複感染

Surveys during the last few years have revealed the incidence of rice tungro (RTV) in many parts of India, particularly the north-eastern region, where the disease has been found to attain epidemic proportions^{1,2,3,5}). Yellow dwarf disease of rice has also been recorded from different areas in North and South India since the first record of its occurrence in this country⁶). The mycoplasmic etiology of the Indian yellow dwarf samples has recently been confirmed⁴).

In course of investigations on RTV and rice yellow dwarf at the Indian Agricultural Research Institute, New Delhi, it was found that these two pathogens can simultaneously affect the rice plant and that individual hoppers of *Nephotettix impicticeps* Ishi. can simultaneously acquire both the pathogens from such a source and transmit RTV and yellow dwarf independent of each other. The evidence of joint infection of the two diseases in nature was also obtained. In this paper we describe the results of our experiments.

All the tests were carried out on the rice variety Taichung Native-1 (TN-1), which was grown in insect-proof glasshouse nursery. Populations of the vector leafhopper, *N. impicticeps* Ishi., were maintained in insect-proof cages on disease-free rice seedlings of the TN-1 variety. Cellulose-acetate-butyrate tubes were used to engage the plants to be fed upon by hoppers.

Experimentally induced infections: First instar nymphs of *N. impicticeps* were allowed to acquire yellow dwarf for five days from a culture which had been collected from Mandya in the Mysore State, and maintained thereafter on rice variety TN-1. Individual nymphs were then transferred serially on test rice seedlings at 3-5 leaf stage, which were kept under observation. On the twentyfifth day from the commencement of acquisition of yellow dwarf, the surviving hoppers which had, in the meanwhile, turned into adults, were allowed to acquire RTV (Faizabad isolate) for 24 hr. Serial transfers of the individual hoppers were then continued till the death of the hoppers. The inoculated plants were kept under observation and the disease symptoms, if any, were duly recorded.

While conducting back inoculation tests from the plants thus infected, the hoppers were allowed to acquire the inoculum for 24 hr. and then serially transferred on test TN-1 seedlings at different intervals. The disease scorings were duly recorded as and when the symptoms appeared.

Fig. 1 shows that both the hoppers could acquire yellow dwarf and become infective during the 7th serial transfer, 21-23 days after commencement of yellow dwarf acquisition. They were allowed to acquire tungro later, in between 8th and 9th transfer. Both the test plants fed upon

* Division of Mycology and Plant Pathology, Indian Agricultural Research Institute, India.

- 1) Govindu, H. C., Harris, H. M. and Yarguntaiah, R. C. (1968). Mysore J. Agric. Sci. 11 (2): 125-127.
- 2) John, V. T. (1970). Indian Farming 20 (3): 27-30.
- 3) Lowe, J. A. (1972). Rice Survey of 1971, Ford Foundation, India (Mimeographed): 1-11.
- 4) Maramorosch, K., Plavsic-Banjac, B., John, V. T. and Raychoudhuri, S. P. (1972). Phytopathology 62: 776 (abstr.).
- 5) Raychaudhuri, S. P., Mishra, M. D. and Ghosh, A. (1967). Pl. Dis. Repr. 51: 300-301.
- 6) Raychaudhuri, S. P., Mishra, M. D. and Ghosh, A. (1967). Pl. Dis. Repr. 51: 1040-1041.

Inoculations from naturally infected rice plants: The natural occurrence of RTV and yellow dwarf together on the same plant was observed while checking a few samples of ratoons of the Kharif or the main rice crop, collected from Jaboi in the district of Burdwan, West Bengal State. The pale yellowish leaves and the dwarfish bushy appearance of the ratoons suggested infection of yellow dwarf. Two or three day old adults of *N. impicticeps* were allowed to feed on the potted samples for 10 days and then transferred individually through a series of test seedlings at different intervals. Further back inoculations from these plants were done by adopting the techniques mentioned above.

Inoculations from ratoons of the main crop from Jaboi confirmed the findings of the above experiments, showing combined infection of RTV and yellow dwarf. The first plant in each of the three series of the three individual hoppers developed typical RTV symptoms (Fig. 2). The next four serial transfers between 13-33 days after acquisition remained unaffected, indicating loss of RTV infectivity on one hand and incomplete incubation of yellow dwarf on the other. The test plants later in the serial transfers developed typical yellow dwarf symptoms except the penultimate one in the first series. Back inoculations separately from RTV and yellow dwarf affected plants confirmed RTV alone and only yellow dwarf, respectively.

Acknowledgements

The authors are thankful to Dr. P. Nandi, formerly attached to the Rice Survey Team of the Ford Foundation, India, for making available diseased samples of rice for examination.

(Received April 28, 1973)