Screening for Cold Tolerance of Chinese and Japanese Rice Varieties and Selection of Standard Varieties

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We tested the cold tolerance of Chinese and Japanese rice varieties under three environmental conditions: natural cool conditions, cool water irrigation and controlled temperature in Yunnan Province.

In the test under the natural cool conditions with several plantings at different dates each year during 1984 to 1986, highly resistant varieties included Lijian-xingtuan-heigu, Kunming-xiaobeigu, Banjieman, Gandiao 3 hao from the high altitude zone of Yunnan. These varieties were more resistant than the corresponding varieties from northern Japan such as Somewake, Hayayuki and Chubo 42. Some Xieng varieties such as Chuxian 1 hao, Kungxian, Dali-zaoxian, and several upland rice varieties such as Weihonggu, Zapu showed a moderate resistance.

The order for cold tolerance in the varieties tested under cool water irrigation mostly coincided with that of the varieties tested under natural conditions, except for the varieties Todorokiwase, Silewah, Jinhong 1 hao, and so on.

For the test of cold tolerance in the greenhouse, plants at the booting stage and at the flowering stage were placed in a cool room. Varieties such as Lijian-xingtuan-heigu, Kunming-xiaobeigu, Chubo 42 and Somewake showed a high resistance at both stages as well as under natural conditions. These Yunnan varieties flowered normally even during the low temperature treatment.

Good germination under low temperature conditions was observed in japonica varieties from the high altitude zone and indica varieties from the low altitude zone in Yunnan. No remarkable cold tolerance at the seedling stage was identified in the materials used, though most of the upland and indica varieties exibit a low tolerance to cold.

To test the cold tolerance of breeding materials in Yunnan, we selected some standard varieties with different degrees of cold tolerance.