Pathogenicity of Rice Blast (*Pyricularia oryzae* Cavara) Isolates from Cambodia and its geographical distribution

Evaluation of 122 blast (*Pyricularia oryzae* Cavara) isolates collected from the Tonle Sap and Mekong River regions of Cambodia revealed a wide variation.

Using a new designation system, the blast isolates were categorized into 92 races based on the reaction patterns of rice differential varieties (DVs) harboring 23 resistance genes and of 1 susceptible cultivar, Lijiangxintuanheigu (LTH).

Cluster analysis was used to classify the blast isolates into 3 groups — I, IIa, and IIb — using data from the reaction patterns of the DVs and LTH (Fig. 1). We used the classification method established under the new designation system, alongside cluster analysis and the geographical distribution of blast isolates, to investigate the diversity and differentiation of blast races in the Tonle Sap and Mekong River regions.

The distribution of the blast races differed between the 2 regions. Blast isolates of group IIa were distributed in both regions, and groups I and IIb occurred at higher frequencies in the Tonle Sap region rather than in the Mekong region. The blast isolates in groups I and IIb were also less diverse than those in group IIa. Accordingly, Group II blast isolates overall were distributed in both regions with high diversity, but some modified blast isolates were additionally distributed in the Tonle Sap region (Fig.2).

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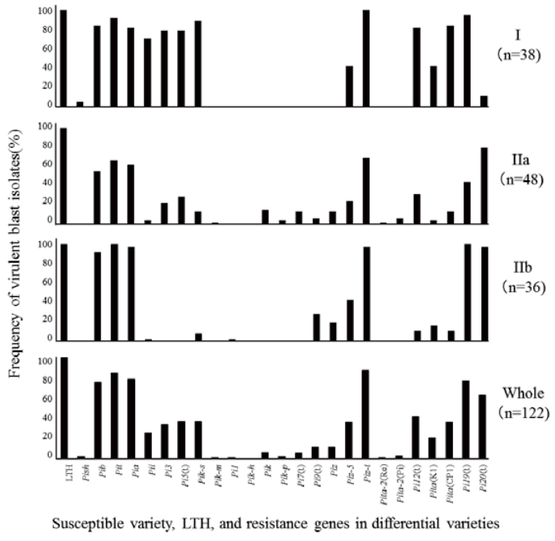

Fig. 1. Frequency of virulent blast isolates from Cambodia against differential varieties.

Blast isolates from Cambodia were classified into three groups--I, IIa, and IIb--==by cluster analysis based on the reaction pattern data of differential varieties harboring 23 resistance genes and of 1 susceptible cultivar, Lijiangxintuanheigu (LTH).

Research Highlight
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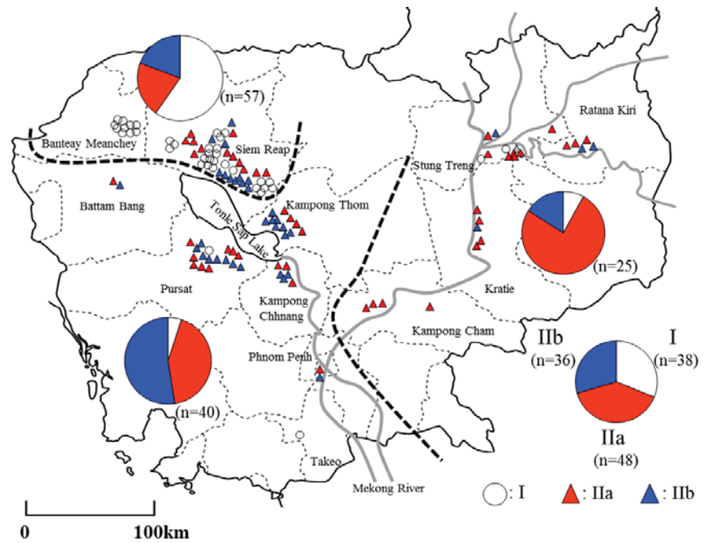

Fig. 2. Distribution of blast isolates, classified into three groups--I , IIa, and IIb--in Cambodia.

Blast isolates of group I was distributed at a high frequency in Siem Reap. In the Mekong River region, group IIa was found at a high frequency, whereas groups I and IIb were at low frequencies. In the Tonle Sap region, the frequency of groups IIa and IIb were similarly high. High diversity group IIa probably comprises the basic population of blast races in Cambodia and that groups I and IIb were modified from IIa. These unique distributions of blast races among the 3 regions might occur and be attributable to differences in genotypes of blast resistance genes in the cultivated rice varieties.