

## Biotype shift in a brown planthopper (BPH) population on IR42

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IR42, with *bph 2* gene for resistance to BPH, was introduced in Indonesia in 1980. However, its BPH resistance has been defeated rather easily by the development of a new biotype in North Sumatra in 1982 and in Central Sulawesi and Riau in 1983.

The developmental process of the new biotype was reproduced in the laboratory at Bogor Research Institute for Food Crops. The field BPH population was collected on susceptible variety Pelita I/1 at Jatisari Field Laboratory, West Java. The Jatisari population is biotype 1. First-instar nymphs hatched on Pelita I/1 plants were individually introduced into test tubes (1.5 × 16 cm) containing 2 IR42 seedlings. Seedlings were changed weekly.

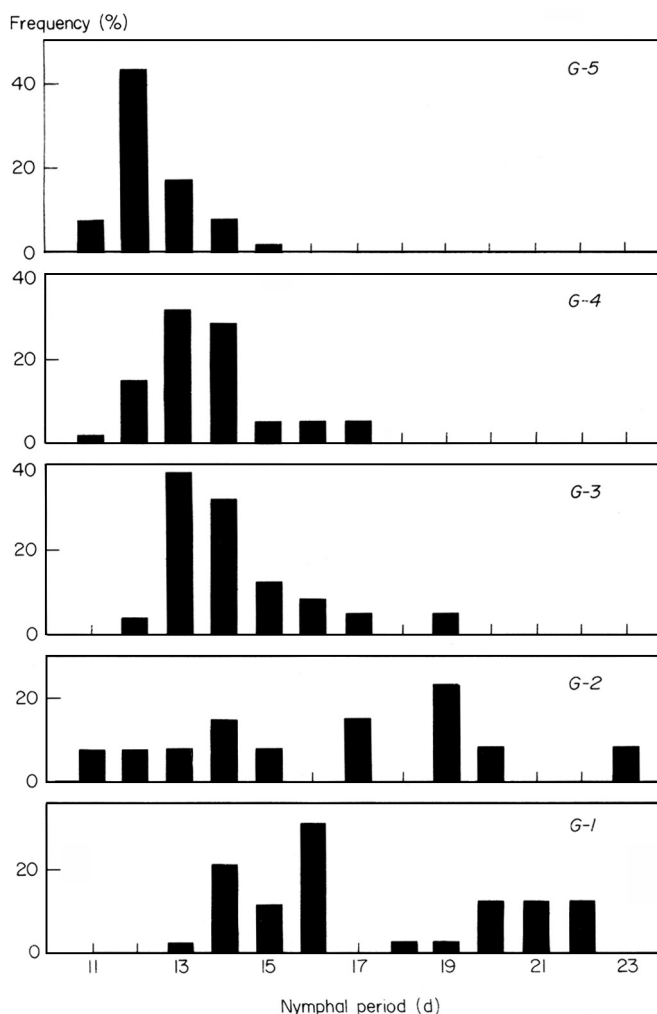
Nymphal development and mortality were recorded daily. Adults that emerged were immediately transferred to Pelita I/1 plants to mate and produce progeny. Nymphs that hatched on the Pelita I/1 plants were again subjected to individual rearing on IR42 seedlings. These procedures were applied for five consecutive generations.

The Jatisari population of the BPH became compatible with IR42 or shifted from biotype 1 to biotype 3 within five generations. Adult emergence on IR42 increased logarithmically, from 19.3 to 82.5%. The average nymphal period was shortened from 17.1 to 12.4 d, and the growth index improved from 1.13 to 6.65 (see table). Adults of the 4th and 5th generations were able to reproduce significantly to maintain the population on IR42 plants at tillering.

During the first 2 generations, nymphal duration on IR42 ranged from 12 to 22 d. However, after the third generation, the variation in duration was gradually reduced to a binomial

## Gradual improvement in the Jatisari BPH population nymphal growth during a course of selection on IR42. Jakarta, Indonesia.

Generation	Nymphs tested (no.)	Adult emergence (%)	Mean nymphal period (d)	Growth index	Brachypterous females (%)
1	197	19.3	17.1 ± 2.9	1.13	62
2	59	22.0	16.4 ± 3.6	1.34	100
3	54	48.1	14.1 ± 1.5	3.42	100
4	58	70.0	13.5 ± 1.3	5.36	100
5	40	82.5	12.4 ± 0.9	6.65	100



Change in frequency distribution of nymphal period of the BPH Jatisari population for 5 consecutive generations selected on IR42 seedlings, Jakarta, Indonesia.

distribution pattern (see figure). About 40% of the females were macropterous

in the first generation; after the second generation, all were brachypterous. □

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