

Evidence of sibling species between two host-associated populations of brown planthopper, *N. lugens* (stål) (Homoptera: Delphacidea) complex based on morphology and host-plant relationship studies

ABSTRACT

Morphological and host-plant relationship studies were conducted to differentiate two sympatric populations of brown planthopper (BPH), *Nilaparvata lugens*, one from rice (*Oryza sativa*) and the other from *Leersia hexandra*, a weed grass. In morphometric studies based on esterase activities, an UPGMA dendrogram using 17 quantitative morphological characters, including stridulatory organs (courtship signal-producing organs) between two sympatric populations of *N. lugens*, one from rice and the other from *L. hexandra*, a weed grass revealed that both populations were separated from each other. An out-group, *N. bakeri*, was found to be completely different from the two sympatric populations of *N. lugens*. Rice plants were best suited for the establishment of the rice-infesting population, and *L. hexandra* was a favourable host for the *Leersia*-infesting population. The individuals derived from one host did not thrive on the other host, as shown by a significant reduction in survival and nymphal development, ovipositional preferences, ovipositional response, and egg hatchability. Therefore, morphological and host-plant relationship studies indicate that rice-associated population with high esterase activities and *L. hexandra*-associated population with low esterase activities are two closely related sibling species.

Keyword: Morphology; Host-plant relation; Brown plant hopper complex; Biological species