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 hostï 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 hostï plant relationship studies indicate that rice-associated population with high esterase activities and L. heaxandra-associated population with low esterase activities are two closely related sibling species.

Keyword: Morphology; Hostï plant relation; Brown plant hopper complex; Biological species