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Morphological and molecular characterization of *Leucinodes orbonalis* Guenee (Brinjal Shoot and fruit borer) from selected locations in Sri Lanka

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Brinjal shoot and fruit borer (*Leucinodes orbonalis*) is one of the most detrimental pests affecting brinjal cultivation. Understanding existing morphological and genetic variations based on geography and the host variety are important in developing efficient pest management strategies. The present study was designed to assess the morphological and genetic variations of *L.orbanalis* infesting brinjal varieties; namely, HORDI Lena iri, Thinnaweli purple, Plastic cultivar and Eerku vellai from randomly selected locations in Anuradhapura, Badulla, Jaffna, Kandy, Kilinochchi, Monaragala, Polonnaruwa and Puttalam districts. The morphological variations of all life stages emerging from infested brinjals collected from all locations were studied independently in lab-rearing colonies. The genetic variations of *L.orbanalis* were investigated using DNA sequences obtained for D3 region of 28S rDNA and cytochrome c oxidase subunit I (COX I) genes. There were no morphological variations observed among life stages that emerged from the colonies. In terms of developmental period, the only difference was observed during the transformation of larval to pupal stage, which exhibited 11.98 days at 26-28^{0}C and 6.04 days at 34-36^{0}C. The pest spent significantly lower time in HORDI Lena Iri (1.98±0.35 days) and higher time in Eerku vellai (2.00±0.00 days). This could be because of variations in seed arrangement and flesh texture. The phylogenetic tree constructed using the COX I sequence (681 bp) revealed five unique groups, whereas no variation was observed in the D3 sequences. Jaffna, Chavakacheri, Kilinochchi, and Monaragala populations were identified as four distinct clades. The populations of Bandarawela, Anuradhapura, and Kaithady were grouped together. Among them, Kaithady population from the Plastic cultivar was separated distinctly from the Bandarawela and Anuradhapura populations infesting HORDI Lena iri. Monaragala population showed higher sequence divergence and more distantly related to all other populations. According to the study, molecular variations were noticed among different populations of *L. orbanalis,* which can be helpful to design a breeding programme to develop a resistant brinjal variety.