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Morphology and Morphometrics of Egg Masses of Fall Armyworm, *Spodoptera frugiperda* (Lepidoptera, Noctuidea) in Sri Lanka

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Abstract

Morphological and morphometric studies on the life cycle stages of a species, specifically the egg stage, provide a sufficient guide in identifying the species from its initial stage. This study was aimed at egg mass characterisation of The Fall Armyworm (*Spodoptera frugiperda*) (FAW); an economically important pest worldwide. Eggs were reared in the laboratory and measurements such as the position of the egg mass, colour, shape, arrangement, number of egg masses per plant and clutch size were obtained. A total of 36 egg masses were studied. Spherical shaped, cream coloured eggs were deposited very closely like a string of beads in flat, single or double layered masses. Majority of the egg masses (72.2%) were single layered. Eggs were firmly attached to the leaf with a sticky substance. Most of the egg masses were found on the underside of Maize leaf blades which is a well-known adaptation of most insect herbivores like lepidopterans. Egg masses were covered with hair-like strands which can be attributed as a mechanism to avoid desiccation. However, 47.22% of the egg masses were partially covered with hairs while only 11.11% of the egg masses were covered fully which also included all egg masses obtained from field.The presence of ridges and transverse lines in eggs were noticeable Noctuid characters in eggs. A considerable variation was observed in number of egg masses laid by a female and its clutch size, which are measures of fitness of adult females. The clutch size varied from 9-200 eggs with an average of 73 eggs but varied from 100-500 eggs in field conditions in previous records. Newly hatched females deposited larger number of eggs but the older females deposited few or no eggs. Thus, the age of the adults also affected their fecundity. The average diameter of an egg was 0.43 mm and the egg stage duration varied with temperature and humidity of the external environment such as having 3-5 days under laboratory conditions. This study provides a baseline for future studies of this pest moth identification and characterisation using morphological and morphometric measurements of the egg stages. The study recommends, sensitising farmers and making them aware of life history characteristics of FAW, thus early detection can be led to early eradication of this pest species, before the emergence of the highly destructive larval stage.

Keywords: *Spodoptera frugiperda*, Fall Armyworm, Egg mass, Morphometrics, Sri Lanka