The Effect of Herbal Extract Supplementation on Biological and Productive Character of Silkworm: A Novel Approach for Efficient Silk Sheath Production

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Silk sheath, an alternative product of silkworms, can be obtained without having to sacrifice the silkworms. This product gives higher net income than the traditional silk cloth. However, silkworms still die from infection by diseases or during hand distribution of the silkworms in the process to improve silk homogeneity. This can result in high percentage of silkworm mortality and consequently loss to silk sheath industry. The healthy growth of the silkworm and its economic traits were influenced by the nutritional status of the leaves fed to silkworms. In this study, we tried to reduce silkworm mortality during silk sheath production by incorporating herbal extracts as a fortified constituent in the mulberry leaves. Fourth instar Bombyx mori larvae were fed with 2% herbal crude extract from Ocimum sanctum, Moringa oleifera, and Andrographis paniculata leaves extracted using ethanol as solvent. The effects of herbal extracts supplementation on fifth instar larvae were investigated in terms of body weight, silk weight, their metamorphosis, and disease incidence. Feeding silkworms with fortified Andrographis paniculata leaf extract showed significant increase in larval weight, higher silk weight and lower disease incidence than when feeding with those of Ocimum sanctum, and Moringa oleifera, respectively. It reduced disease incidence of silkworms by 3.0 times. Interestingly, the feeding behavior and metamorphosis of silkworms were not affected by the treatment. This treatment yielded golden yellow silk sheath in highest silk weight per area and highest homogeneity. Furthermore, silkworm mortality during silk sheath production was reduced by 3.2 folds compared with control.

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