



Study on varietal preference and nutritional indices of tea looper *Hyposidra talaca* (Lepidoptera: Geometridae) on ten selected tea varieties

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Abstract

To find out the varietal preference of *H. talaca* larvae, leaves of ten selected tea cultivars were provided separately to II, III, IV, and V instars. The food consumption by different larval instars was the maximum on TV20 followed by TV1 > K1/1 > TV22 > TV26 > TV16 > SNT8 > TS520 > HP12 > B157. The nutritional indices showed the highest ECD and ECI values on TV20 followed by other cultivars. However, AD values were inversely proportional to the ECI and ECD. Biochemical analysis of the host leaves indicated higher carbohydrate and lipid concentrations in TV20 which was positively correlated ($r = 0.6351$) with the mean food consumption, whereas, the lowest carbohydrate and lipid concentration was observed in TS520. The levels of secondary metabolites such as alkaloids ($r = -0.6137$) and flavonoids ($r = -0.7403$) showed a negative correlation with larval food consumption. Results of HPLC analysis showed the presence of different types of catechins like, EGC, Catechin, EC, EGCG, ECG, and caffeine in variable quantity in all cultivars that were positively correlated with larval feeding except the Gallic acid which showed a negative correlation ($r = -0.5610$). Based on the larval food consumption, the susceptible index of cultivars were categorized as 'highly susceptible' (TV20, TV1, K1/1, TV22, TV26, TV16, and SNT8), 'susceptible' (TS520 and HP12), and 'moderately susceptible' (B157). Based on cluster analysis A1 grouped (TS520 and HP12), A2 indicated B157 whereas sub-branches B1 grouped (TV22, TV16, TV26, and SNT8) and B2 grouped (TV1, TV20, and K1/1).

Keywords Tea variety · *Hyposidra talaca* · Food consumption · Secondary metabolites · Nutritional indices · Susceptible index

Introduction

The perennial plant tea *Camellia sinensis* (L.) Kuntze is cultivated on large and small scale in the Assam and Sub-Himalayan region of West Bengal in Northern India. Tea plantation along with shade trees provides shelter and food for diverse

arthropod species. The black inch looper, *Hyposidra talaca* Walker, causes significant crop loss in tea growing regions of India especially West Bengal (Dooars and Terai) and Assam and has gained the status of major destructive pest of tea (Sinu et al. 2011; Roy et al. 2017). This widely distributed lepidopteran insect has been reported to attack several host plants viz., cinchona (*Cinchona officinalis*), coffee (*Coffea arabica*) litchi (*Litchi chinensis*), longan (*Dimocarpus longan*), mango (*Mangifera indica*), mangosteen (*Garcinia mangostana*) Hill glory bower (*Clerodendron infortunatum*), Indian mahogany (*Chukrasia tabularis*), Sea derris (*Derris robusta*) (Sinu et al. 2011; Basu Majumdar et al. 2010; Intachat et al. 2001). The developing stages of *H. talaca* consume tender and mature leaves with an average of 12,690.33 cm² leaf area leading to significant crop loss besides causing stress to the tea plant (Prasad and Mukhopadhyay 2013). Continuous application of synthetic pesticides for controlling this pest has its limitations leading to

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