



Behavioral and electrophysiological responses of mango hopper, *Idioscopus nitidulus* (Walker) (Hemiptera: Cicadellidae) to host cues

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ABSTRACT : Mango hopper, *Idioscopus nitidulus* (Walker), is a perilous pest monophagous to mango. Through co-evolution, hoppers have been tuned to detect mango inflorescence, which is their sole feeding and oviposition forte. Here, we studied the behavior of the mango hopper, *I. nitidulus*, towards headspace volatiles of mango (cv. Totapuri) inflorescence through olfactometer bioassays and GC-EAD. The chemical composition of inflorescence volatiles were analyzed by GC-MS/MS. The time spent by adult *I. nitidulus* in the treatment and control was found significantly different. Electrophysiological responses of hoppers to volatiles of mango flowers revealed fifteen volatile compounds. This study provides evidence that chemical cues in mango flower volatiles may act as probable attractants.

Keywords: Hopper, mango, semiochemicals, volatile

INTRODUCTION

Flowers volatiles from the higher plants serve as potential attractants for herbivores (Visser, 1986). Host-produced volatile chemical cues (kairomones) play an important role in enabling insects to recognize their host plants at a distance. Usually, herbivores may avoid certain non-host plant volatiles (Dicke, 1986; Pallini *et al.* 1997), but attracted to their host plant volatiles (Loughrin *et al.* 1995; Bolter *et al.* 1997; Pallini *et al.* 1997; Dicke & Vet 1999). In many cases the volatiles are specific for herbivory, or even for the herbivore species that inflicts the damage. This is all the more so in case of monophagous insects like mango hoppers, *Idioscopus nitidulus* (Walker) (Homoptera: Cicadellidae) that exclusively feeds on mango inflorescence. Such host specialization tunes the monophagous species to volatiles that are specific to their host plants. Our thorough understanding of insect plant interactions could strengthen our current pest management programmes as discovery of potent chemical cues (=host plant derived kairomones) is helpful for designing sustainable, semiochemical based IPM programs (Kamala Jayanthi *et al.* 2015).

Mango hopper, *Idioscopus nitidulus* (Walker) (Hemiptera: Cicadellidae) is the most serious pest and widespread throughout the country. Enormous numbers of nymphs and adults are found clustering on the

inflorescence during spring, sucking the sap. The infested flowers shrivel, turn brown and ultimately fall off causing non-setting of flowers and dropping of immature set fruits, thereby reducing the yield. On attaining maturity the hoppers leave the blossoms and move on to the leaves. Swarms of adults are commonly seen hovering in mango groves and sitting on all plant parts. The hoppers excrete honeydew that covers the inflorescence, leaves and fruits encouraging black sooty mold, which affects photosynthetic activity of leaves and market quality of fruits (Verghese & Kamala Jayanthi 2001). Since the mango hopper is a monophagous pest confining to mango only, it is assumed that it may respond the mango inflorescence chemical cues (kairomones) that may have potential for use in mango hopper pest management programs in future. The present investigation was undertaken to identify the potent host volatile cues from mango inflorescence to mango hopper *I. nitidulus*.

MATERIALS AND METHODS

The study was carried out at Indian Institute of Horticultural Research (IIHR), Bangalore, India (12°58'N; 77°35'E). The mango hoppers, *I. nitidulus* and the mango inflorescence used for the study were collected from the experimental mango orchards of IIHR.