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RESEARCH NOTE

Differential attraction of Jamun seed borer, *Anselmella kerrichi* (Narayanan, Subba Rao & Patel, 1988) to various colour traps

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ABSTRACT: An attempt was made to understand the colour preference *vis-à-vis* spectral sensitivity of phytophagous eulophid seed borer, *Anelmella kerrichi* (Narayanan et al.) of Jamun, *Syzygium cumini* L. using sticky traps. Sex biased colour preferences were observed among the female and male wasps. The female and male wasps colour preference was in the order of blue>yellow>purple>pink>white; and yellow>purple>blue>white>pink respectively. Both the sexes did not get attracted to the green colour. The possibility of standardizing the sticky color traps for the management of *A. kerrichi* discussed.

Keywords: *Anselmella kerrichi*, Jamun, colour traps, spectral sensitivity

Jamun, *Syzygium cumini* L. (Myrtaceae) is a common evergreen tree in Indian subcontinent with its dense foliage generally grown in tropical and subtropical zones from Myanmar to Afghanistan (Rajesh *et al.,* 2010). The cultivation of this crop in India is increasing owing to its commercial potential. Tiny but a potential pest of Jamun, *Anselmella kerrichi* (Narayanan, Subba Rao and Patel, 1988), an eulohid seed borer have been affecting the Jamun fruits lately causing immense damage. The grubs of *A. kerrichi* larvae are phytophagous and mainly feed on the seeds of Jamun (Xiao *et al*., 2006). Considering the fact that the Jamun fruits are consumed fresh, standardizing the eco-friendly management strategies against *A. kerrichi* is highly appropriate. Generally, olfaction (host odour) and vision (colour, size, shape) are exploited by insects to orient towards their host plants (Dobson, 1994; Terry, 1997). In the current study, we explored the attraction of *A. kerrichi* to various coloured sticky traps to explore its colour preferences. Thus, the study deals with the comparison of *A.kerrichi*'s attraction to various colors with an aim to identify the opt colour trap for eco-friendly management of the pest. The study was carried out in the experimental fields of ICAR-Indian Institute of Horticultural Research, Bangalore (13.14° N, 77.50° E) during April – May, 2019.

The coloured sticky traps used for the study were prepared using A4 size cardboard sheets of different colours *viz*., Indian blue (Blue group 118C; HCC 51/2), Chrysocella green (green group 129B; HCC 56/1), Canary yellow (Yellow group 9A; HCC 2), Imperial purple (Purple group 78B; HCC 33/1), Magenta Rose (Red purple group 64D; HCC 027), White (155A) (Napier, 1971). On to these coloured sheets, glue was applied uniformly and then these card board sheets were mounted on to the Jamun tree branches at a height of 2 m above the ground. The trap data comprising the number of male and female *A. kerrichi* adults was recorded on daily basis for a period of 30 days. Each colour trap was replicated thrice. Statistical analyses of the data collected were done using Graph Pad Prism (Version 7.0).

Significant differences were observed for the mean number of adult wasps trapped in different colours. The blue coloured traps recorded significantly more number of female wasps (0.66±0.13) followed by yellow (0.55±0.15) compared to green traps (F =4.391; P=0.0007). However, there was no significant difference between the blue and yellow traps. The females did not get attracted to green colour traps. The number of wasps trapped in different colours were in the order of: blue (0.66±0.13)> yellow (0.55±0.15) > purple (0.43±0.11) >pink (0.41±0.098) >white (0.25±0.099) >green(0.00) (Fig.1).

On contrary, significantly more number of male wasps were trapped in yellow (0.85±0.19) compared to the green, purple, white and pink traps (F = 8.473; P<0.0001). No significant difference was observed among the remaining colours for trap catch. The order of colour preference was yellow (0.85±0.19) > purple (0.31±0.069)> blue (0.24±0.07) >white (0.27±0.09) > pink (0.16±0.06) > green (0.00). Similar to females, interestingly males also did not get attracted to green coloured traps (Fig.1).

Each insect species respond differently to coloured surface which is often termed as spectral sensitivity of that particular species that is governed by their

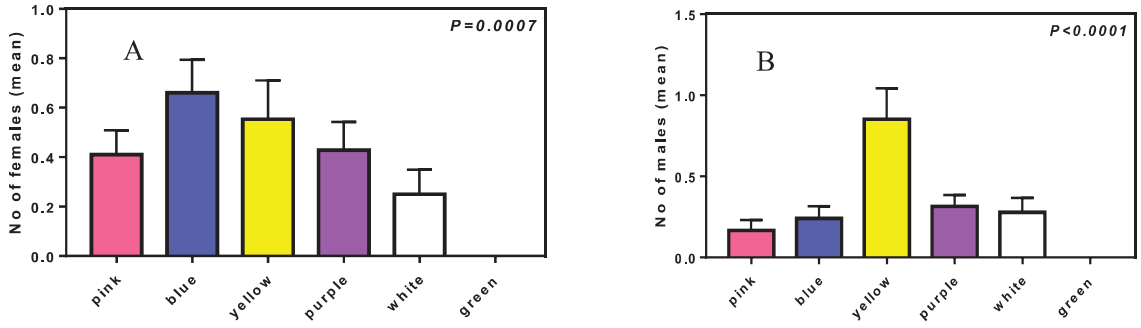

Fig. 1. Adult Jamun seed borer, *A. kerrichi* response to different colour traps, A. Females B. Males.

sensory receptors and type of stimuli they respond (Vaishampayan *et al.,* 1975). Usually, colour contrasts are used by insects to make a distinction between the host and the surrounding environment. The parameters like wavelength emitted by the surface, colour saturation and overall reflection from the surface affects the insect attraction to a particular object (Terry, 1997). In insects, spectral sensitivity is linked with the host plant orientation for feeding and oviposition. Understanding the fact that the colour sensitivity of insect pests often help us in formulating sustainable management tools like coloured trapping systems (Antignus, 2000), the present study highlights the colour preferences of eulophid wasp, *A. kerrichi* that attacks Jamun seeds. In this study, we selected the colours viz., blue, purple, pink as they resemble ripe Jamun fruits that are dark purple in colour. Whereas, the colours like yellow and green were selected to depict the colours of immature fruits, flowers and leaves. We noticed sex biased spectral sensitivity in *A. kerrichi*. The female wasps were significantly more attracted to blue (P=0.0007), whereas the males to yellow (P=0.0001). The attraction of females to blue coloured traps can be accounted for the colour similarity with fruits highlighting that the females would have oriented towards this colour in search of their egg laying sites. Previous studies have shown that aphids attracted to yellow colour and thrips to blue (Mattson and Terry, 1992). The minimal trap numbers observed in the present study may be due to the poor flight ability of the insect or low population numbers existed during the period of experimentation. Future work to further improvise the colour sticky traps for the management of *A. kerrichi* will support the integrated pest management strategies against this cryptic pest.

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REFERENCES

Antignus, Y. 2000. Manipulation of wavelength-dependent behaviour of insects: an IPM tool to impede insects and restrict epidemics of insect-borne viruses. *Virus Research,* **71**:213–220.

Dobson, H.E. 1994. Floral volatiles in insect biology. In: Bernays, E.A. (Ed.), Insect–Plant Interactions, vol. 5. CRC Press, Boca Raton, FL, pp. 47–81.

Matteson, N., and Terry, L.I. 1992. Response to colour by male and female *Frankliniella occidentalis*. *Entomologia Experimentalis et Applicata*. **63:** 187–201.

Napier, E. 1971. The Royal Horticultural Society Colour Chart. *Journal of the Royal Horticultural Society.* **96**: 500-536.

Narayanan, E.S., Subba Rao, B.R. and Patel, G.A.A. 1957. A new pteromalid genus from India. *Indian Journal of Entomology.* **19**: 202-203.

Rajesh, K., Ramamurthy, V.V. and Sharma, G. 2010. Checklist of insects associated with Jamun (*Syzygiumn cuminii* Skeels) from India. *Biological Forum — An International Journal*, **2**: 1-5.

Vaishampayan, S.M., Waldbauer, G.P. and Kogan, M., 1975b. Visual and olfactory responses in orientation to plants by the greenhouse whitefly, *Trialeurodes aporariorum* (Homoptera: Aleurodidae). *Entomologia Experimentalis et Applicata*. **18**: 412–422.

Terry, L.I. 1997. Host selection, communication and reproductive behaviour. In: Lewis, T. (Ed.), Thrips as Crop Pests. CAB International, New York, pp. 65–118.

Xiao, H., Xu, L., Huang, D. and Zhao, Z. 2006. *Anselmella malacia,* A New Pest Wasp (Hymenoptera: Chalcidoidea: Eulophidae) Reared from *Syzygium samarangense* in Malaysia. *Phytoparasitica.* **34** :261-264.

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