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Short Communication

Light trap, an effective component of integrated management of *Tuta absoluta*(Lepidoptera : Gelechiidae) on Tomato

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ABSTRACT

The effectiveness of mass trapping the moths of *Tuta absoluta* was evaluated using light traps in tomato polyhouse at ICAR-Indian Institute of Horticultural Research, Bengaluru during March - June, 2018. Various colours of light sources were evaluated for their efficacy in attracting the moths. Of different coloured light sources evaluated, yellow and white (bluish) were found relatively effective for attraction of the moths. The efficacy of mass trapping was further evaluated and incandescent yellow bulb of 60 W was found most efficient in attracting both sexes of *Tuta* moths. Thus light traps can be an effective tool for IPM of this pest on tomato, under polyhouse conditions.

Key words: *Tuta absoluta*, light trap, mass trapping

INTRODUCTION

Insect attraction to different light sources is a known fact and light trapping is an ideal method for surveying nocturnal moth population. Light trap collections provide a significant clue to understand the diversity of nocturnal insects which differ in their affinity to varied wavelengths of light (Southwood and Henderson, 2000). As an alternative to chemical based pest management, light traps have been used in different countries in pest management (Srivastava *et al*., 1992; Oliveira *et al.,* 2008; Ma *et al*., 2009). In India, *Tuta absoluta* (Lepidoptera: Gelechiidae) has been reported from Karnataka and Maharashtra during 2014 and has further spread to all the major tomato-growing regions/states (Sridhar *et al*., 2014;Swathi *et al*., 2017). The pest can cause up to 100% crop loss in both greenhouse and open field cultivated tomato. The leaf-mining habit of this pest makes chemical or biological control more difficult. As an alternative, mass trapping could be useful in the management of *T.absoluta*. Light traps are advantageous over pheromone traps as they attract both male and female moths (Cocco *et al.,* 2012). Information on type of light source effective against *T. absoluta* is scanty. Hence, the present study was conducted to identify the visible range for the maximum attraction of *T. absoluta* adults.

The trials were conducted in a tomato polyhouse located at ICAR-Indian Institute of Horticultural Research, Bengaluru during March – June 2018. Initially, different light sources in the visible spectrum (wavelength of 390 – 700 nano meters) were screened for attracting tomato moth, *T. absoluta* during March 2018.Based on initial evaluation results, different bulbs *viz.,* LED 8W; Incandescent bulb (15W, 40W, 60W) and CFL 10W which attracted relatively more moths of *T. absoluta* were installed in the tomato polyhouse. The tomato crop was 50 days old after transplanting and was in flowering stage when the light traps were installed. The observations/counts on number of moths trapped were taken daily for 5 days to assess the best source of light attracting maximum number of *Tuta* moths. The number of males and females attracted to the light source were differentiated based on the size and wing colour pattern and also based on genetalia.

Incandescent (yellow) bulb was found most effective followed by white (bluish) in attracting *Tuta* moths. Of all the bulbs under study, Incandescent (yellow) 60 W bulb attracted maximum number of *Tuta*

adults *i.e.*, 2953 catches within 5 days when compared to other sources of light tested **(Table 1, Fig. 1 & 2).** Of the total catch, up to 46 per cent catch of the moths constitutes females and thus use of light traps can be an effective tool in the integrated management of *T. absoluta*. Light traps have been effectively used for the management of pests in cotton and rice (Srivastava *et al*., 1992; Ma *et al*., 2009). As the light traps can also attract some of the natural enemies, there is a need to study the peak activity of the pest, so that timer based automated (switch on and off) light traps can be designed, which can minimise trapping of natural enemies.

Table 1. Relative catches of *T. absoluta* moths in different light traps

Source of light/Bulb*	Day 1 (12/5/18)	Day 2 (13/5/18)	Day 3 (14/5/18)	Day 4 (15/5/18)	Day 5 (16/5/18)	Total	Males (%)	Females (%)
LED 8 W (Bluish white)	170	770	492	454	318	2204	54	46
Incandescent 15 W (Yellow)	130	250	225	410	201	1216	55	45
Incandescent 40 W (Yellow)	150	350	330	390	140	1360	55	45
Incandescent 60 W (Yellow)	260	892	671	820	310	2953	54	46
CFL 10 W (Milky white)	130	495	352	410	158	1545	58	42

*****Per cent female catches in these light traps ranged from 42 - 46 %.

Fig 1. Light trap installed in tomato polyhouse

Fig 2. *Tuta* moths attracted to 60 W yellow incandescent light

From the present study, we conclude that, incandescent (yellow) 60 W bulb can be used as an efficient tool/component in IPM for management of *T. absoluta* on tomato, under polyhouse condition.

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