

Waste Paper Cups : An Inconceivable Driver of Pollinators' Decline

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Received 2 June 2021, Accepted 21 September 2021, Published on 9 October 2021

ABSTRACT

Reduction in abundance of insects and other pollinators in many ecosystems, recorded worldwide in the present scenario is the resultant of several human activities, which be knowingly or unknowingly. Although the existence of pollinator decline can be difficult to determine, but in this direction an attempt was made in a survey at Mohanpur, Nadia, West Bengal, India and it was found that the widespread use of waste tea cups is posing a serious threat to the abundance of *Apis cerana indica*, *A. dorsata* and a group of dipteran flies, which are potent pollinators.

Keywords Pollinator decline, Waste paper cups, *Apis cerana indica*, *A. dorsata*.

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INTRODUCTION

Pollinators hold a key position in maintaining the flora and fauna across the globe of the total pollination activities, over 80% is performed by insects and among them bees are considered as the best pollinators (Robinson and Morse 1989). In India, the important pollinators of crops include honey bees viz., *A. dorsata*, *A. cerana*, *A. mellifera* and *A. florea*. The services they provide to human kind is inevitable but studies showed that in last 25 years more than 40% of honey bees have been disappeared in India (Gallai *et al.* 2009). The major reason for the extinction of these pollinators is habitat loss and fragmentation, agricultural chemicals, pests and diseases, climate change and the interactions between them (Potts *et al.* 2010). Recently new dimension of studies registering various unimaginable causes of honey bees' population decline, one among these is microwave radiation from mobile towers (Sharma and Kumar 2010). However, these are only reliable data on drivers of pollinators decline. There might be some others also. So, the present study to find out the new driver of pollinators decline.

MATERIALS AND METHODS

A survey was conducted at Mohanpur, Nadia, West-Bengal (22°56'38'' N ; 88°31'57'' E and 3.53 msl) in search of some new drivers of bees' decline. Ten random busy tea stalls were chosen to explore whether or not the waste cups of tea stalls have any

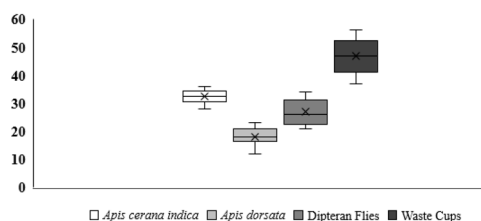


Fig. 1. Box and Whisker plot analysis for dead pollinators and waste cups.

effect on the decline of bees as waste cups contain left-over parts of tea. The survey was carried out continuously for a period of one month, February 2020 at 9-10 am, which is peak foraging hours of pollinators. The data on diversity and abundance of dead pollinators were recorded for a period of 1 h and also the percent mortality was calculated.

RESULTS AND DISCUSSION

During entire survey, two honey bee species viz., *Apis cerana indica*, *A. dorsata* and a group of dipteran flies (Syrphids, house fly and fruit fly) were

observed to visit the used tea cups in the dust bean. With an average of 46.7 (37–56) waste cups, a mean of 32.3 (28–36) *Apis cerana indica*, 18.1 (12–23) *A. dorsata* and 26.8 (21–34) flies were found dead in an hour of a day per stall. Among the total mortality, 42% occurred in case of *Apis cerana indica* which was the highest followed flies (35%) and *A. dorsata* (23%) (Figs. 1, 2). The present findings corroborated the findings of Sandilyan (2014) who have documented that *Melipona iridipennis* get attracted toward disposable cup and nearly 48 bees/10 min were found to have lost their lives in a single cup. The variation in number of dead bees observed here might be due to species variation. Similarly, Chandrasekaran *et al.* (2011) recorded 25, 211 dead bees in the coffee bars in one-month study.

CONCLUSION

The waste cups are appearing as artificial traps for pollinators and increase in their use seriously threatening the pollinators' abundance which ultimately challenging the sustainability of biodiversity and animal food security.

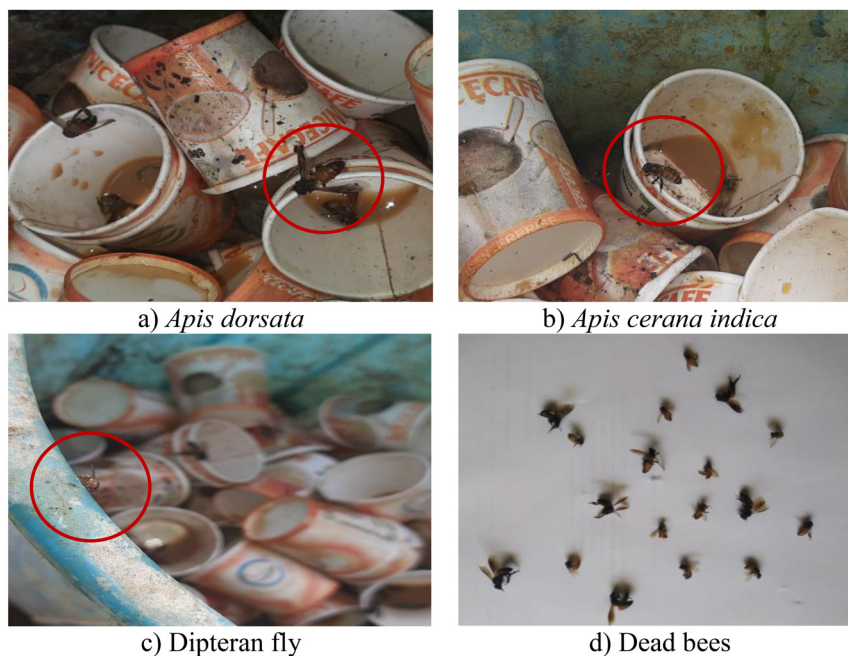


Fig. 2. Dead pollinators observed during the study.

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