Development and predation rate of *Dortus primarius*, a predatory mirid bug on *Frankliniella schultzei* larvae treated with a novel fungus *Lecanicillium fusisporum*

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***Dortus primarius* is a predatory mirid bug that has been recorded feeding on different insect pests. *Lecanicillium* spp., an entomopathogenic fungus (EPF), is used as a biocontrol agent against sucking pests. The combined use of *D. primarius* and novel fungus *Lecanicillium fusisporum* may have a significant effect in controlling sucking pests like *Frankliniella schultzei*. Before combined use, it is imperative to investigate the effect of *L. fusisporum* on *D. primarius* pertaining to its biology, predation potential and prey preference. This predator was able to complete development when *L. fusisporum* treated thrips were offered as food. The nymphal duration on treated thrips (21.11 ± 0.24 days) was four days more than on untreated thrips. The longevity of male and female predatory bugs fed on treated thrips was less than that of untreated thrips. The hatching percentage of bugs consuming fungal-treated thrips (83.32 ± 2.68) showed no difference compared to those fed on untreated thrips (86.47 ± 3.01). Fecundity was found to be reduced in bugs that fed on fungal-treated thrips. However, no adverse effects were observed in the first filial (F1) generation derived from these predators. An adult bug consumed an average of 13.88 ± 0.23 untreated thrips per day compared to 10.24 ± 0.49 treated thrips. When offered both treated and untreated thrips, various instars and adults of *D. primarius* consistently showed a preference for the untreated thrips. The results indicated no such detrimental effect on the survival of the predatory bug and the F1 generation. Moreover, in the choice test, bugs preferred untreated thrips, indicating that in the presence of *L. fusisporum* in the vicinity, bugs can avoid feeding on infected prey.**

Keywords: Biology, compatibility, entomopathogenic fungi, IPM strategy, mirid bug, natural enemy.

belonging to 35 families. The pest not only causes direct damage to plants by feeding on them, but is also a vector of Tospovirus[4,5].

Some natural enemies like mites, *Orius* spp. and spiders were recorded as effective against *F. schultzei* [6,7]. Establishment of *Orius insidiosus* in strawberry indicated its potential against *F. schultzei* [8]. *Dortus primarius* is a generalist mirid predatory bug which was observed feeding on *F. schultzei* in the laboratory[9]. Besides predatory insects, several entomopathogenic fungi (EPF) have been found effective against thrips[10–12]. It is required to assess the compatibility of biocontrol agents for utilisation in pest management[13]. EPF can cause infection in the bodies of insect pests, resulting in their control. Early stages, like eggs and newly hatched stages, are susceptible to EPF due to their unhardened cuticle[14]. *Lecanicillium* spp. is used as a biocontrol agent against aphids, thrips, whiteflies, mealybugs, etc[15]. *Lecanicillium fusisporum* (NBAIR strain) has been found effective against sucking pests, viz., thrips, aphids and leafhopper. However, exploring natural enemies (both macrobials and microbials) and evaluating their compatibility against serious pests like thrips is important. However, before deploying more than one natural enemy against pests, it is essential to study the effect of the fungus and its safety to the insect's natural enemies. Therefore, the present study has been conducted to test the effect of a novel fungus strain *L. fusisporum* (NBAIR strain), on the biology and prey preference of *D. primarius* for the possibility of association of both these bioagents against *F. schultzei* for its management.

Materials and methods

EPF culture

L. fusisporum NBAIR strain was initially cultured on Sabouraud dextrose yeast agar (SDYA) medium and incubated at 25 ± 1°C for 8 to 10 days to promote optimal