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Record of parasitoid, *Cowperia indica* (Kerrich) (Encyrtidae) on *Cryptolaemus montrouzieri* Mulsant associated with mealybugs from Karnataka

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ABSTRACT: Surveys were conducted to collect coccinellid predators associated with the mealybug species in different districts of Karnataka. However, there is a great diversity of coccinellid parasitoid species that are less studied. During the survey it was noticed that a pupae of coccinellid predator, *Cryptolaemus montrouzieri* (Coleoptera) were found parasitized by a hymenopteran parasitoid, *Cowperia indica* belonging to the family Encyrtidae which were associated with mealybug species *viz.*, *Ferrsia virgata, Planococcus citri* and *Planococcus lilacinus*.

Keywords: Mealybug, coccinellid, encyrtidae, parasitoid, predator, pupae.

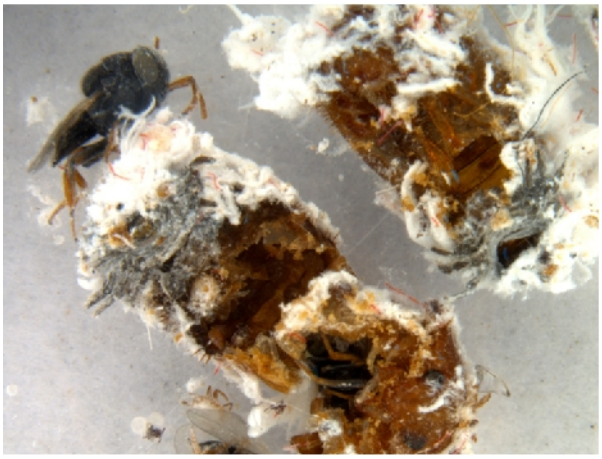
INTRODUCTION

Mealybugs are the major pests of crops in India due to elimination of natural biocontrol agents or due to indiscriminate application of pesticides. Coccinellids are the most studied groups of predators primarily focused on their role as natural enemies of soft-bodied insect pests (Riddick *et al*., 2009). *Cryptolaemus montrouzieri* is one of the most important coccinellid predators used for biocontrol of the mealybug pests since its larvae and adult life stages both feed on the prey (Poorani, 2002). Several pathogens and parasitoids were known to attack different coccinellid predators. A number of hymenopteran parasitoids act as larval or larval or pupal parasitoids of predatory coccinellids (Gautam, 1994; Kranti *et al*., 2008). Although knowledge of naturally occurring hymenopteran parasitoids associated with *C. montrouzieri* was limited. Therefore, present study has been taken to investigate parasitoids emerging from coccinellids associated with different mealybug species from various ecosystem.

MATERIAL AND METHODS

Surveys were conducted to collect coccinellid predators associated with mealybug species in different districts of Karnataka. Mealybugs infested plant parts along with predatory larval coccinellid, *Cryptolaemus montrouzieri* were collected and reared on different stages of mealybug until adulthood. During rearing, the emergence of parasitoids was noticed from the pupae of coccinellid predator, *C. montrouzieri*. The emerged parasitoids were collected and preserved in 70 % ethanol with proper labels for taxonomic identification from experts. The adults of the encyrtid parasitoid, *Cowperia indica* emerging from parasitized pupae of *C. montrouzieri* is shown in Plate 1.

A) Male B) Female



C) *Cowperia indica* emerging from pupa of *Cryptolaemus montrouzieri*

Plate 1. Hymenopteran parasitoid, *Cowperia indica*

RESULTS AND DISCUSSION

A parasitoid, *Cowperia indica* (Kerrich) (Encyrtidae) was found parasitizing the pupa of a coccinellid predator, *Cryptolaemus montrouzieri* (Coleoptera) predating on mealybugs *viz*., *Ferrsia virgata*, *Planococcus citri* and *Planococcus lilacinus* on different hosts *viz*., guava, neem and cocoa, respectively during the study period. Similarly, Kazmi and Kumar (2012) recorded *C. indica* emerging from pupae of *C. montronzieri.* Several species of the genus *Homalotylus* have also been recorded as parasitoids of coccinellid larvae in the subfamilies Coccinellinae, Chilocorinae and Scymninae (Ceryngier and Hodek, 1996). Parasitization of coccinellid predator, *Cheilomenes sexmaculata* by encyrtid parasitoid, *Homalotylus* sp. was reported by Megha *et al*. (2015). The parasitoid, *C. indica* may limit populations of *C. montrouzieri* which is a potential predator of mealybug pest in different ecosystem. Further studies need to be carried out to determine the ability of coccinellid predators to defend themselves against attack from various parasitoids.

CONCLUSION

Most reports of parasitoids present only a host record with little data about the impact on populations of entomophagous species. During the present study, we have reported parasitoid, *C. indica* parasitizing the pupae of coccinellid, *C. montrouzieri.* Hence, further studies on parasitization of coccinellids in different species needs to be taken up as they are potential predators of many insect pest species in different ecosystem.

FUTURE SCOPE

A wide variety of parasitoids are found attacking different life stages of coccinellids in spite of their varied defense mechanisms. Further, studies on per cent parasitization of hymenopteran species in regulating the population dynamics of coccinellid predators needs to be addressed.

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Conflict of Interest. None.

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