

Report of *Novius fumidus* Mulsant (Coccinellidae: Coleoptera); A potential Predator of Egyptian Cottony Cushion Scale (*Icerya aegyptiaca* Douglas) Infesting *Casuarina equisetifolia* in Gujarat, India

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ABSTRACT: During *kharif* season of the year 2022, survey was carried to document the activity of bio-agents under biodiversity research trial of All India Co-ordinated Research Project on Biological Control of Crop Pests (AICRP-BC), Anand Agricultural University, Anand (Gujarat). During the survey *Novius fumidus* Mulsant was observed as a potential coccinellid predator of Egyptian cottony cushion scale (*Icerya aegyptiaca* Douglas) infesting *Casuarina equisetifolia*. The collected specimens were morphologically described (length 4.08-4.56 mm and width 3.36-3.66 mm). Body of the predator was semi-spherical, robust, elongate oval, narrowed towards apex in posterior half, dorsal side covered with dense short hair. Larva was robust, ellipsoidal in outline and white in colour. Pupa was dark reddish brown. Therefore, the present study is the first ever report of *N. fumidus* as a predator of Egyptian cottony cushion scale (*I. aegyptiaca*) infesting *C. equisetifolia* in Gujarat, India.

Keywords: *Novius fumidus*, Coccinellids, Predator, Egyptian cottony cushion scale, *Casuarina equisetifolia*.

INTRODUCTION

An evergreen tree native to Australia that can be found in South-East Asia and on Pacific island chains is called *Casuarina equisetifolia*. In the nineteenth century, it was introduced to India (Warrier *et al.*, 2014). This plant has gained significant importance in the forestation of coastal areas, degraded and eroded sites, where soil nutrients are low, due to its numerous uses and resilience to varied eco-climatic and edaphic zones of the country. It is also preferred as an agro-forestry crop and mainly grown for its fuel wood purpose. Tree bark has astringent and antioxidant characteristics and is used to treat diabetes, ulcers, toothaches, headaches, fever, dysentery, and diarrhoea (Prajapati, 2003). Despite being regarded as a robust woody tree, India has documented 70 types of insects infesting this tree (Sasidharan, 2004). *Icerya aegyptiaca* Douglas (Hemiptera : Monophlebidae) is commonly known as Egyptian cottony cushion scale or Egyptian fluted scale or breadfruit mealybug. *I. aegyptiaca* is highly polyphagous sucking insect pests known to feed on about 123 species of plants belonging to 49 plant families (Ben-Dov *et al.*, 2009).

Coccinellids, also referred to as ladybird beetles, are members of the family Coccinellidae in the order Coleoptera. Ladybird beetles are widespread in many Asian nations, including India, and are well-known around the world as insect predators. (Singh and Brar 2004). They come in sizes ranging from a few millimetres to about an inch square, and they have

stunning, appealing colours. Due to their predation on soft-bodied phytophagous insects, coccinellids have a high economic significance and are advantageous to farmers. *Novius* species have a semi-spherical body, covered with densely short hairs. They are reddish-purple, with or without black spots. Adults of *Novius* species feeding on scale insects, aphids and small mites, which makes them good as biological control agent (Anon, 2021). As a predator of Egyptian cottony cushion scale (*Icerya aegyptiaca* Douglas) on *C. equisetifolia* from Gujarat, India, the *Novius fumidus* has not been documented. It was formerly placed in the genus *Rodolia*, but that genus was synonymized under the genus *Novius* in 2020 (Pang *et al.*, 2020). In India, *Rodolia fumida* was recorded from Karnataka, Madhya Pradesh, Tamil Nadu, Uttar Pradesh, Assam, Bihar, Delhi, Himachal Pradesh, Maharashtra, Meghalaya, Punjab, West Bengal and Gujarat (Jadhav and Sharma 2012; Pathan *et al.*, 2018).

MATERIALS AND METHODS

Under the framework of the All India Co-ordinated Research Project on Biological Control of Crop Pests, a biodiversity research trial is being conducted. During *kharif* 2022, regular surveys were conducted to document the activity of various natural enemies in different crop ecosystems. During the survey, a coccinellid predator was found feeding on Egyptian cottony cushion scale (*I. aegyptiaca*) infesting *C. equisetifolia*. Coccinellids were collected and preserved

in 70 per cent ethyl alcohol. Specimens were sent to ICAR-National Research Centre on Banana, Trichy, India for identification.

RESULTS

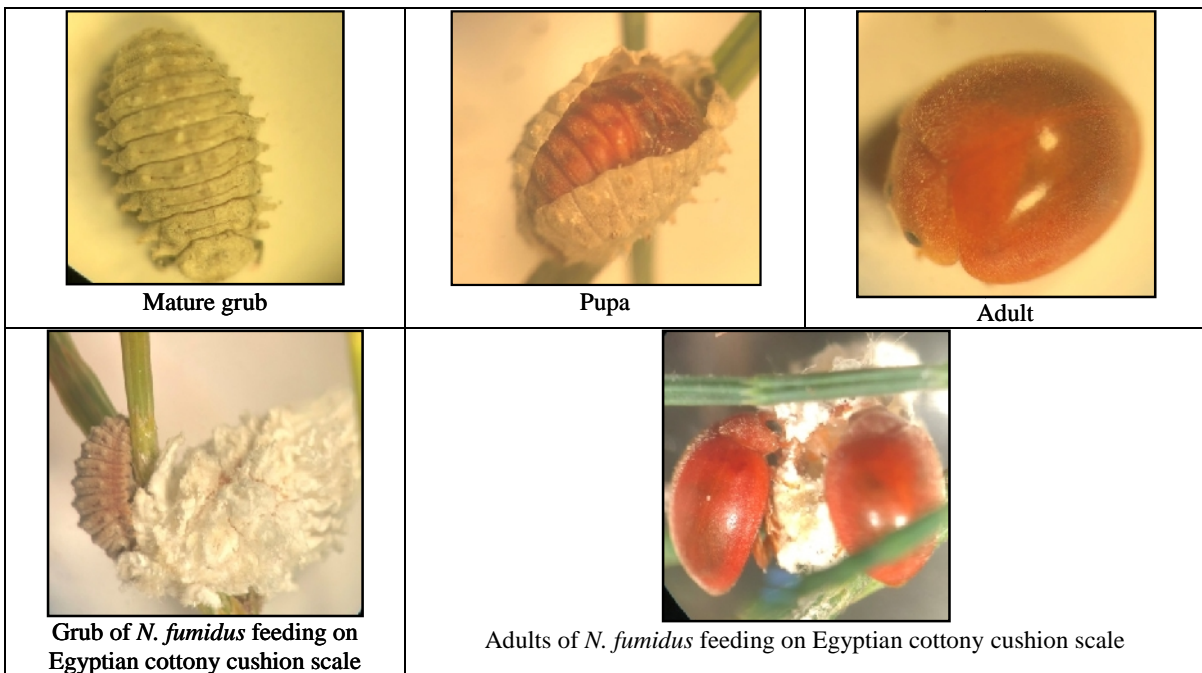
In the present study, infestation of *I. aegyptiaca* was observed on *C. equisetifolia* in the month of May-June 2022. Simultaneously, the occurrence of coccinellid predator was recorded during the month of June-July 2022. The coccinellids collected were identified as *N. fumidus*. Both the grubs as well as adult of *N. fumidus* were predatory in habit on Egyptian cottony cushion scale (*I. aegyptiaca*). This observation appears to be the first documenting the infestation of *I. aegyptiaca* feeding on *C. equisetifolia* tree in Gujarat.

Morphological characters. Early in star grubs were black to brown in colour later on, changed to white. Grub was robust, ellipsoidal in outline and white colour. Pupa was dark reddish brown in colour. Adult has semi-spherical body, length 4.08-4.56 mm, width 3.36-3.66mm. Form robust, elongate oval, narrowed towards apex in posterior half. Dorsal side more or less uniformly reddish-brown and covered with dense short hair, elytra sometimes with ill-defined darker patches. Antenna short and eight-segmented.

Feeding potential. It was found that a grub of *N. fumidus* can feed one Egyptian cottony cushion scale insect/day. Adult also feeds on this pest. However, the feeding potential of adult was found low as compared to the grub stage.

DISCUSSION

During the investigation, *N. fumidus* was recorded on Egyptian cottony cushion scale (*I. aegyptiaca*) infesting *C. equisetifolia*. It is the first report from Gujarat because there has been no information on this predator that preys on *I. aegyptiaca*. *Rodolia fumida* was reported as a predator of *Aphis craccivora* (Megha *et al.*, 2015) *Drosicha stebbingi* Green (Omkar and Ahmad 2004), *I. purchase* and *Phenacoccus solenopsis* (CABI, 2018). *R. fumida* recorded as bio-control agent of *Perisopneumon ferox* newstead and its activity was observed during the months of June and July (Pathan *et al.*, 2018). *Aleurodicus dispersus* Russell, *Drosicha mangiferae* Green, *Drosicha stebbingi* (Green), *Icerya* spp., *Perisopneumon ferox* newstead, *Perisopneumon tamarindus* (Green), *Perisopneumon* sp. collected on sugarcane, mango, citrus, guava, erythrina, tamarind, palmyra palm, and ornamental plants such as *Acalypha* sp (Anon, 2013).



CONCLUSION

The present study highlights the report of *I. aegyptiaca* infesting *C. equisetifolia* in fields of Anand Agricultural University, Anand, Gujarat (India). Further, it also emphasized the occurrence of coccinellid predator *N. fumidus* Mulsant on Egyptian cottony cushion scale (*I. aegyptiaca*) infesting *C. equisetifolia*.

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Conflict of Interest. None.

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