Short Scientific Report
doi.org/10.25081/jpc.2018.v46.i3.2039
Journal of Plantation Crops, 2018, 46(3): 221-223

Diversity of mantids in tea plantation

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(Manuscript Received: 22-11-2017, Revised: 19-06-2018, Accepted: 21-10-2018)

Tea (*Camellia sinensis*), is an important perennial plantation crop mainly grown as monoculture in India. Among the pests that attack tea plants, tea mosquito bug (TMB), *Helopeltis theivora* Waterhouse (Hemiptera: Miridae) is an important pest and its incidence is more in young plants and bushes. Infestation by TMB leads to deforming and drying of shoots and heavy crop loss (Radhakrishnan and Srikumar, 2015). In tea fields, *H. theivora* is attacked by several natural enemies such as coccinellids, neuropterans, spiders, reduviids and syrphids (Muraleedharan and Radhakrishnan, 1986; Muraleedharan *et al*., 2001). To prevent the indiscriminate use of pesticides in tea planations, different cultural and bio-control techniques are being tested. Predators like praying mantids are possible entrant in biological control of insect pests (Vanitha *et al*., 2016) and play a major role in managing pests in tea ecosystem. The mantid fauna of India (Insecta: Mantodea) was described by Mukherjee *et al.* (2012). Being important predators, the diversity of praying mantids in tea plantations were neglected, but for scattered publications (Das *et al*., 2015) and hence, the current study.

Random survey was undertaken during the period of June 2014 to July 2017 at the UPASI Tea Research Foundation Experimental Farm and tea plantations of Anamalais, Coimbatore. Mantids were collected by hand-picking method. Collections were made from tea plantations including bush base, canopy of tea bushes and common weed plants in vicinity. Mantids were wrapped in polythene bags, and tightly closed with rubber bands, before brought to the laboratory. The identification of the collected mantids was done at Department of Zoology, Modern College, Pune.

During the survey, eight species of praying mantids belonging to seven genus and four families were recorded (Fig.1). Mantids exhibited seasonal variation in their occurrence. Most of the mantid species were recorded during monsoon and winter seasons (Table 1). Among the eight species, *Hierodula membranacea* Burmeister was dominant in mantids surveyed. Under confined condition, *H. membranacea* consumed 125.6 ± 8.4 *H. theivora* adults in a day (Fig. 2). Further in-depth studies focusing on the biological parameters, seasonality and predatory efficacy are necessary to gauge the role played by praying mantid as bio-control agent in tea plantations.

Table 1. Praying mantis species recorded in tea plantations

Family	Species (Nos.)	Months
	Acromantis insularis Giglio-Tos (2)	June
	Hierodula membranacea Burmeister (17)	June
Mantidae	*Hierodula* sp. (9)	August
	Tenodera aridifolia Stoll (1)	December
	Statilia maculate Thunberg (2)	July
Liturgusidae	*Humertiella ceylonica* Saussure (5)	April
Iridopterygidae	*Eomantis guttatipennis* Stal (3)	November
Hymenopodidae	*Euantissa pulchra* Fabricius (7)	February

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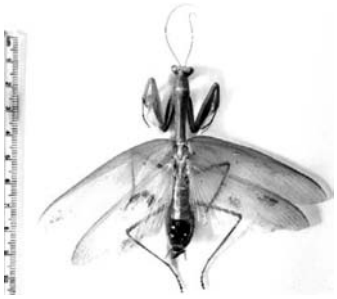
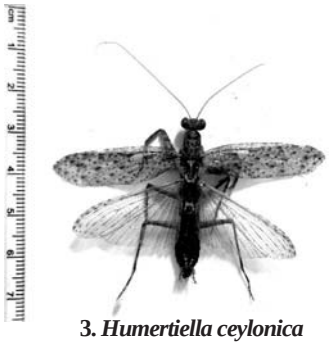


1. *Hierodula membranacea*

2. *Hierodula* sp.

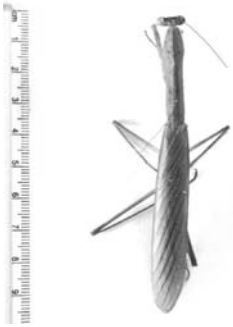


3. *Humertiella ceylonica*

4. *Statilia maculate*

5. *Eomantis guttatipennis*

6. *Euantissa pulchra*



7. *Tenodera aridifolia*

8. *Acromantis insularis*

Fig. 1. Different species of praying mantis recorded in tea plantations

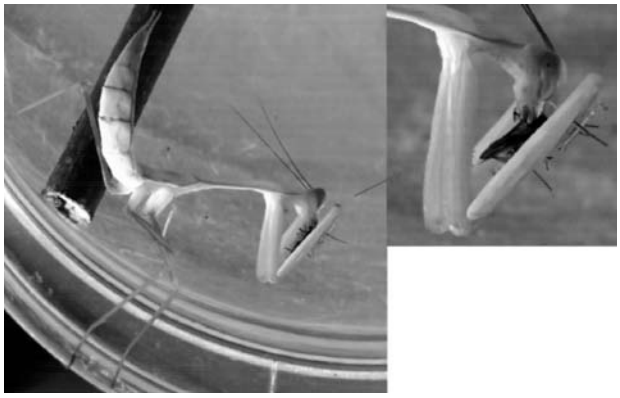


Fig. 2. *Hierodula membranacea* feeding on *Helopeltis theivora* in laboratory

Acknowledgement

The authors are obliged to Dr. H. V. Ghate, Department of Zoology, Modern College of Pune, Maharashtra for identifying the mantid species, providing literature and reviewing the manuscript.

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