



Research Note

Aenasius arizonensis girault (Hymenoptera: Encyrtidae): A potential biocontrol agent of cotton Mealybug, *Phenacoccus solenopsis* Tinsley

S. THANGAVEL^{1*} and N. GANAPATHY²

¹Department of Agricultural Entomology, B A College of Agriculture, Anand Agricultural University, Anand – 388 110, Gujarat, India

²Department of Entomology, Controllerate of Examinations, Tamil Nadu Agricultural University, Coimbatore – 641003, Tamil Nadu, India

*Corresponding author E-mail: entothanga@gmail.com

ABSTRACT: The parasitization potential of three parasitoids viz., a parasitoid, *Aenasius arizonensis*, and two predators, *Cheilomenes sexmaculata* and *Cryptolaemus montrouzieri*. was studied on *Phenacoccus solenopsis* under laboratory conditions. Among them *A. arizonensis* alone recorded parasitization to an extent of 40.91%.

KEY WORDS: *Aenasius Arizonensis*, Mass Culturing, *Phenococcus solenopsis*, Parasitization

(Article chronicle: Received: 14.06.2017; Revised: 22.09.2017; Accepted: 10.12.2017)

INTRODUCTION.

Cotton (*Gossypium hirsutum* L.), the “King of Fiber” popularly known as “White Gold”, is an important cash crop in India. About 200 insect pests are reported to attack cotton crop in India (Anonymous, 1992). Among them, *Phenacoccus solenopsis* Tinsley is a destructive pest of cotton, which originated from USA and co-evolved with numerous food plants. The devastating outbreak of *P. solenopsis* is reported to have caused nearly 30-60% yield losses from India and Pakistan during 2005-2009. Since then the pest has received worldwide attention as an invasive species of quarantine importance. *Aenasius arizonensis* (Girault) (= *Aenasius bambawalei* Hayat) (Hymenoptera: Encyrtidae), a solitary endoparasitoid has been recorded as an effective natural enemy of *P. solenopsis*.

An experimental trial with cotton (MCU 5) was conducted by sowing in the month of August 2016 in an area of 70 cents. Observations on mealybug and its natural enemies were recorded on weekly interval from September to November. The crop was kept free from pesticide application. Number of mealybug and its natural enemies per plant were recorded from five randomly selected plants. Ladybird bee-

flies were recorded *in situ*. In the case of *A. arizonensis*, the mealybug samples on which adults of the parasitoids were observed in field were brought to lab and maintained for adult emergence. From this *A. arizonensis* parasitoids were enumerated. The data obtained were subjected to Regression and Correlation analysis. The significance of differences was tested by adopting F-tests, while the significance of difference between the treatment mean values was compared by LSD at 5 per cent probability (Gomes and Gomes, 1984).

In the present study, three natural enemies were recorded viz., a parasitoid, *Aenasius arizonensis*, and two predators, *Cheilomenes sexmaculata* and *Cryptolaemus montrouzieri*. The parasitization potential of parasitoids was studied on *P. solenopsis* under laboratory conditions. Among them *A. arizonensis* alone recorded parasitization to an extent of 40.91% (Table 1). Results from the regression ($R^2 = 0.94$) indicated that there was strong significant positive correlation of parasitoids and coccinellid predators with mealybug population. The findings of present study were in accordance with Aga *et al.*, (2016) who reported maximum percentage (90%) of parasitization in adult stage of mealybug. The results of the

Table 1. Monitoring of mealybug and its natural enemies population in cotton ecosystem during 2016

Months	Weeks	Mean number/ plant				
		Mealybug	<i>Aenasius</i> sp.	<i>Cheilomenes</i> sp.	<i>Cryptolaemus</i> sp.	Total per cent parasitization
September	I	7.00	2.20	3.00	2.80	23.91
September	II	12.40	7.00	5.60	1.20	36.08
September	III	16.80	5.60	4.40	3.40	25.00
September	IV	14.20	8.00	2.60	2.00	36.04
October	I	22.60	12.40	7.00	3.60	35.43
October	II	8.80	3.60	6.80	1.20	29.03
October	III	13.40	8.00	5.00	2.40	37.38
October	IV	23.20	14.20	8.40	4.80	37.97
November	I	15.60	10.80	6.80	3.20	40.91
November	II	26.20	18.00	3.20	2.60	40.72
November	III	18.80	11.20	4.00	5.00	37.33
November	IV	41.00	23.00	11.60	3.60	35.94

study was also in line with Pala Ram and Saini (2010) who reported that, the activity of *Aenasius arizonensis* on *P. solenopsis* increased with significant decrease in the pest population and the incidence was confined only to 18% of the fields and 1.6% of the plants.

ACKNOWLEDGEMENT

The authors were thankful to Department of Agricultural Entomology, TNAU for providing facility for conducting research and Dr. S. Sridharan, Professor (Agricultural Entomology), TNAU, Coimbatore for the identification of parasitoids.

REFERENCES

Aga TM, Tambe VJ, Nagrare VS, and Bhausahab Naikwadi. 2016. Parasitoid, *Aenasius arizonensis* (Girault)

(Hymenoptera: Encyrtidae): it's Biology, morphometrics, host stage preference and use in biological control. *J Biol control*. **30**(2): 91–98.

Anonymous 1992. Agricultural Situation in India. May 1994. pp 110.

Gomez KA and Gomez AA. 1984. *Statistical procedures for Agricultural Research*. Second Edition. Wiley. 704pp.

Pala Ram and Saini RK. 2010. Biological control of Solenopsis mealybug, *Phenacoccus solenopsis* Tinsley on Cotton: A Typical Example of fortuitous Biological Control. *J Biol control*. **24**(2).