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'reliminary observations on the biology of three species of blister eetle genus *Mylabris*

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Abstract: **The biology of blister beetle species, *Mylabris pustulata* Thunb, *Mylabris thunbergii* Billberg and *Mylabris* sp. was studied at National Pulses Research Centre. Vamban, Tamil Nadu, India. Female *M. pustulata* laid eggs in the soil at a mean depth of 30-50 mm and the mean number of eggs laid ranged from 92.6 to 97.1 respectively. The eggs were yellow (2.43 x 0.92 mm) and hatched in 29.6 days. The neonate triangulins were black and less active than other two species with a mean length and width of 4.90 and 0.96 mm respectively. Adults lived 20.1 days in rainy to 24.7 days in post-rainy seasons. The elytra on the adults has four black and red coloured bands. Female *Mylabris* sp. laid eggs in the soil at a mean depth of 20-30 mm. The mean number of eggs laid ranged from 121.3 to 128.0. Eggs were pure white (2.0 x 0.41 mm) with a mean incubation periof of 23.4 to 32.6 days. The triangulins were very active and yellowish white in colour with a size of 3.60 x 0.50 mm. The mean adult period lasted for 21.3 days in post-rainy to 23.0 days in rainy seasons and the adults have black, white and orange coloured bands on the elytra. *M. thunbergii* was observed only during post-rainy season. Female *M. thunbergii* laid eggs in soil at a depth of 15-25 mm and the mean number of eggs laid were 81.3. The eggs were yellowish white with a size of 1.92 x 0.52 mm with an average egg period of 30.4 days. The triangulins were very active and were yellowish white with a size of 4.00 x 0.50 mm. The adults were with a black colour band in between two red colour bands on the elytra and the longevity period was 21.2 days. All the three species laid their eggs as single mass. The above observations are reported for the first time in India.**

Key Words: Blister beetle, Mylabris genus, Biological observations.

Introduction

Pigeonpea (*Cajanus cajan* (L.) Millsp.) is one of the important pulse crops being grown in India. Pigeonpea is also an important crop in Asia, Africa and Latin America and is being grown in more than 23 countries throughout the world. In Asia, which accounts for approximately 90 per cent of world population, pigeonpea is the third most important pulse crop, where India, Myanmar and Nepal are the largest producers (Nene and Sheila, 1990). Among the pests infesting this crop, the pod borer complex is the major one as the attack is directly on the reproductive parts and cause's severe yield loss. In Tamil Nadu, after the introduction of short duration pigeonpea, the flower feeding beetle *Mylabris* sp. (Coleoptera: Meloidae) once considered to be the minor pest, assumed major pest status and causes severe yield loss. This beetle has been reported as pest of various agricultural crops feeding gregariously (Anand, 1978). In North India, it caused severe damage in early maturing varieties of pigeonpea (Yadava *et al.* 1988). The severity of the damage was noticed in the hilly areas of Himachal Pradesh also (Garg, 1985; Kashyap *et al.* 1990).

Different species of blister beetle are known to cause damage to pulses in Africa, South East Asia, Bangladesh and in Sri Lanka (Anon, 1981). In Tamil Nadu, three species of blister beetle *M. pustulata, M. thunbergii* and *Mylabris* sp. have been found to feed on pulse crops. When host plants were available, this pest was present throughout the year (Durairaj and Ganapathy, 1996). The different species of *Mylabris* were found to feed more than 75 plant species which includes both cultivated and non cultivated plants (Durairaj, 1998). In North India, *Mylabris phalerata* Pall, *M. pustulata* and *M. macilenta* Marshall caused considerable

Table 1. Biological observations on three species of Blister beetle genus *Mylabris*

Observations*	*Mylabris pustulata*		*Mylabris* sp.		*Mylabris thunbergii*	
	Range	Mean	Range	Mean	Range	Mean
Egg laying depth (mm)**	30-50	40.2	20-30	26.0	15-25	18.5
Number of eggs**laid female**	58-133	97.1 ± 26.5	89-196	121.3 ± 24.6		
Number of eggs laid/female***	60-136	92.6 ± 22.7	98-167	128.0 ± 19.1	63-106	81.3 ± 13.4
Egg colour	Yellow		White		Yellowish white	
Egg length (mm)	2.2-2.7	2.43 ± 0.14	1.72-2.3	2.0 ± 0.17	1.8-2.0	1.92 ± 0.08
Egg width (mm)	0.8-1.2	0.92 ± 0.13	0.3-0.5	0.41 ± 0.09	0.4-0.7	0.52 ± 0.09
Egg period (days) **	22-38	29.6 ± 4.3	19-27	23.4 ± 2.36		
Egg period (days)***	26-34	28.8 ± 2.6	27-42	32.6 ± 4.8	27-39	30.4 ± 3.54
Triangulins colour	Black		Yellowish white		Yellowish white	
Triangulins length (mm)	4.5-5.5	4.90 ± 0.28	3.5-4.0	3.60 ± 0.28	3.5-4.0	4.00 ± 0.11
Triangulins width (mm)	0.9-1.0	0.96 ± 0.01	0.4-0.5	0.50 ± 0.01	0.4-0.6	0.50 ± 0.01
Adult length (mm)	240-310	267 ± 24	160-210	168 ± 29	140-190	166 ± 15
Adult width (mm)	50-90	76 ± 15	42-70	55 ± 8	42-70	55 ± 10
Adult longevity (days)**	8-33	20.1 ± 8.6	6-36	22.0 ± 8.9		
Adult longevity (days)***	6-39	24.7 ± 10.5	8-35	21.3 ± 8.1	8-45	21.2 ± 13.8
Adult colour	Four bands of alternated, black and red colour in the elytra		Black, white & orange colour bands on the elytra		A black colour band in between two red colour bands on the elytra	

* Mean of 15 observations
** Rainy season
*** Post rainy season

lamage to pigeonpea (Garg, 1985; Dutta and ingh, 1989; Kashyap *et al.* 1990). In recent ears, blister beetle attained major pest status n pulse growing areas especially in pigeonpea. As published information on the biology of his pest is meagre, an attempt was made to tudy the biology in pigeonpea.

Materials and Methods

The egg laying potential of three species of *Mylabris* was studied by confining the adults of each species. Fifteen pairs of beetles of each species were collected from the field on nating. Each pair was kept separately in a ransparent plastic container (16 x 8 cm dia.) with moist loose soil for 10 cm and fed with fresh pigeonpea flowers each day. The egg aying site, number of eggs laid, colour, length nd width (at middle) of the eggs of each pecies were recorded. These observations were nade in the rainy (June-September) and post-ainy (October-February) seasons of 1997 for *M. pustulata* and *Mylabris* sp. and during post-rainy season of 1997 for *M. thunbergii*. The egg developmental period was assessed by observing the day of egg laying and the day of egg hatch. Observations were also made on the neonate triangulins (grubs) for colour and size.

Adult longevity was studied using field collected beetles. As field population of these beetles consist of different age groups, every day 15 beetles were collected and confined in a plastic container with pigeonpea flowers as food source. Every day fresh flowers were placed by replacing old one. Beetles were collected over a period of 15 days. When there was mortality of the beetles, the longevity of adults was recorded for each species.

Results and Discussion

Females of different species laid their eggs at various depths in the soil. *Mylabris pustulata* deposited eggs in 30-50 mm deep. *Mylabris* sp. laid their eggs at a depth of 20-30 mm and the *M. thunbergii* egg laying depth was about 15-25 mm. The eggs were laid as single mass by all the three species studied. There were marked variation in the size and colour of the eggs among the species. Eggs were yellow, yellowish white and pure white for *M. pustulata*, *M. thunbergii* and *Mylabris* sp. respectively. The size was comparatively larger for *M. pustulata* (2.43 ± 0.14 x 0.92 ± 0.13 mm), followed by *M. thunbergii* (1.92 ± 0.08 x 0.52 ± 0.09 mm) and *Mylabris* sp. (2.0 ± 0.17 x 0.41 ± 0.09 mm). *M.pustulata* laid 58-133 eggs during rainy and 60-136 eggs during post-rainy seasons with a mean of 97.1 ± 26.5 and 92.6 ± 22.7 respectively. *Mylabris* sp. laid 89-196 eggs during rainy with a mean of 121.3 ± 24.6 and 98-167 eggs during post-rainy seaons with a mean of 128.0 ± 19.1 eggs. Minimum number of eggs (81.3 ± 13.4 eggs/mass) laid by *M. thunbergii* (Table 1). The incubation period was more or less similar for *M.pustulata* and *M. thunbergii* which was around 29-30 days. But this period varied from 23.4 in rainy to 32.6 days in post-rainy seasons for *Mylabris* sp. During the process of rearing, it was observed that the triangulins of *M. pustulata* were blackish, while *M. thunbergii* and *Mylabris* sp. triangulins were yellowish white. The triangulins of *Mylabris* sp. were very active, while the triangulins of other two species were less active. Length and breadth of triangulins of *M. pustulata*, *Mylabris* sp. and *M. thunbergii* were 4.0 and 0.96, 3.60 and 0.50 and 4.00 and 0.50 mm respectively.

The adults of *M. pustulata* were larger in size (267 ± 24 x 76 ± 15 mm) with four alternated black and red colour bands on the elytra. The *Mylabris* sp. and *M. thunbergii* were smaller in size (168 ± 29 x 55 ± 8 mm and 166 ± 15 x 55 ± 10 mm respectively) (Table 1). Adult *Mylabris* sp. had black, white and orange coloured bands on the elytra, while the adults of *M. thunbergii* had a black colour band in between two red colour bands. The adult longevity period for *M. pustulata* was comparatively high with a mean period of 20.1 ± 8.6 days during rainy and 24.7 ± 10.5 days during post-rainy seasons. The adult period for *Mylabris* sp. was 22.0 ± 8.9 days during rainy and 21.3 ± 8.1 days during post-rainy, sensons while it was 21.2 ± 13.8 days during post-rainy season for *M.thunbergii*.

Observations on the various stages of biological development of three species of *Mylabris* showed greater variation. Though all the three species laid their eggs in soil, the egg laying depth, number of eggs per mass and the size

of the eggs varied with species *M. pustulata* laid eggs deeper than the other two species. But the range of depth of all three species overlap. *M. pustulata* and *Mylabris* sp. were found throughout the year, while *M. thunbergii* was noticed only during post rainy season. This species may diapause during one of the life stages. The incubation period for *M. pustulata* and *M. thunbergii* was the same in the rainy and post-rainy seasons but for *Mylabris* sp. almost 10 days variation was observed between the seasons. More egg period during post-rainy season which is having cooler months might forced the eggs to tide over the winter effect.

The triangulins are reported to be predatory, feeding on the eggs of orthopteran and some soil insects (Anon, 1981). But for want of orthopteran eggs, an attempt was made to rear the triangulins by providing cowpea aphids *Aphis craccivora*. Though some amount of feeding by the triangulins was noticed during the rearing process, it was possible only to extend the life span of the young ones and not able to complete the life cycle. In none of the earlier references, there was any mention about the specific host for triangulins, their feeding potential and other related informations. Hence detailed studied are to be carried out for the successful rearing of blister beetle. Only on the successful rearing, it will be possible to understand the immature stages and adult longevity of the beetle species. Very few references are available with regard to the biological observations of this beetle. Earlier Patnaik *et al.* (1993) observed that eggs of *M. pustulata* were laid in soil at a depth of 1-5 cm with 67 to 330 eggs. The length and breadth of eggs were 2.5 and 1.0 mm respectively. The egg period during summer was 25 days, while it was 178 days during winter. It was also reported that more than 10000 eggs were laid by a female beetle in soil (Anon, 1981).

The present study gives some basic informations on the biology to proceed further. The informations on the biology for *M. thunbergii* and *Mylabris* sp. is reported for the first time in India.

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