

New alternative weed hosts and comparative biology of the rice blue beetle *Leptispa pygmaea* Baly

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ABSTRACT

Studies made on weed plants commonly seen growing in the rice fields at the Regional Agricultural Research Station, Pattambi, Kerala Agricultural University, indicated that *Leptispa pygmaea* Baly fed on five weed plants belonging to the family Poaceae, two from the family of Limnocharitaceae, one each from Cyperaceae, Pontederiaceae and Lythraceae. But oviposition of the beetle was observed only on two alternative hosts viz., *Panicum repens* and *Isachne miliacea* of Poaceae. The beetle was found to lay 12-15 eggs on *P. repens* and 5-8 eggs on *I. miliacea* but there was no egg hatching on *I. miliacea* and the beetle completed its life cycle on *P. repens*. Biological study of *L. pygmaea* on *P. repens* showed a shorter life cycle of 11.5 days from egg to adult in the weed host as against 14.8 days on the rice variety Jyothi. *P. repens* males lived longer (38.4 days) than females with a longevity of 23.7 days. *Panicum repens* is a new record as an important alternative host for rice blue beetle.

Key words: *Leptispa pygmaea*, rice alternative *Panicum repens*, *Isachne miliacea*

The blue beetle, *Leptispa pygmaea* Baly (Coleoptera: Chrysomelidae) hitherto reported as a minor pest of rice (Patel and Patel, 1970; David and Kumaraswami, 1975; Dale, 1994), has recently assumed a serious status as an emerging problem by causing much concern to the rice cultivation in Kerala particularly in Palakkad, Kannur, Kasaragod and Trivandrum districts. Severe outbreaks of this pest inflicting extensive damage in the early stages of crop growth have been reported by farmers in both wet and dry seasons. The identification of alternative hosts of rice blue beetle in rice ecosystem is of much importance in the management of the pest. Diverse weed flora present in rice fields act as potent source of pest infestations. No attempt has been reported to screen out the alternative hosts of rice blue beetle under Kerala conditions. Hence, a study was undertaken to identify the alternative weed hosts of *L. pygmaea* in the rice ecosystem and work out the biology of rice blue beetle on different hosts plants.

A survey was conducted on the weed flora present in the rice fields of Regional Agricultural Research Station, Pattambi, Kerala Agricultural University during 2005 in order to identify the weeds

that served as alternative host plants of *L. pygmaea*. Ten major weed plants commonly seen in the rice fields and on the bunds were collected and grown in separate pots in the net house. Freshly emerged five pairs of adult beetles were released on the identified weeds and covered with polyester cages of size 49 x 18 cm and observed for their feeding and oviposition. Based on the fecundity and egg hatchability the most preferred weed host was selected. The biology of *L. pygmaea* on the most preferred weed plant was studied in the net house at the prevailing conditions of maximum temperature ($30.1^{\circ}\text{C} \pm 1.40^{\circ}\text{C}$), minimum temperature ($23.1^{\circ}\text{C} \pm 0.69^{\circ}\text{C}$) and relative humidity ($94.33\% \pm 2.11\%$) during June to October, 2005. Simultaneously, the life cycle of *L. pygmaea* was worked out on two preferred rice varieties viz. Jyothi (short duration) and Aiswarya (medium duration) in order to make a study on the comparative biology of rice blue beetle.

L. pygmaea was reported for the first time on ten weed plants viz. *Fimbristylis miliacea*, *Panicum repens*, *Isachne miliacea*, *Oryza rufipogon*, *Monochoria vaginalis*, *Sacciolepis interrupta*, *Limnocarid flava*, *Eichornia crassipes*, *Echiochloa*

colona and *Ammania baccifera* grown in rice fields (Table 1). Half of the identified weed hosts belonged to the family Poaceae, two from the family Limnocharitaceae, and one each from Cyperceae, Pontederiaceae and Lythraceae. But rigorous feeding and oviposition of *L. pygmaea* were observed only on *Panicum repens* and *Isachne miliacea* (Fig. 1) of the family Poaceae, earlier known as Graminae. The adult beetle laid 12-15 eggs on *P. repens* and 5-8 eggs *I. miliacea*. All the eggs laid on *P. repens* hatched out while there was no hatch of eggs on *I. miliacea*.

The emerging fed by scrapping the green matter of leaves similar to that of rice (Fig.1). A comparative study of the biology of *L. pygmaea* on Jyothi, Aiswarya and *P.anicum repens* (Table 2) indicated that the life cycle of rice blue beetle larvae was shortest with 11.5 days on *P. repens* followed by Aiswarya (13.8 days) and Jyothi (14.8 days). The pupation of the larvae took place on the weed host (Plate 1). Fecundity was also lowest on the weed as compared to rice. The adults were found to feed on the weed host besides the rice plant in the field (Plate 1). The longevity of female beetle was 23.7 days on *P.*

repens while it was 24.9 days on rice cv.Jyothi. Male life span was highest (40.9 days) on Jyothi followed by *P. repens* (38.4) and Aiswarya (36.7). Males lived longer than females on both rice and weeds. The suitability of *P. repens* as an efficient alternative host for blue beetle is thus indicated from its shortest life cycle and other biological parameters on *P. repens*. The identification of *P. repens* as a good alternative host for *L. pygmaea* is reported for the first time and thus adds to the list of earlier reported alternative hosts viz. *Arundinella metzii*, *Ischaemum travancorence*, *Paspalum scropiculatum*, *Pennisetum purpureotyphoides*, *Arundinella sp.*, *Panicum maximum*, *Dichanthium aristatum* and *Brachiaria mutica* (Dalvi *et al.*, 1985). Although the adult beetles were observed feeding on these host plants during the off season, no egg laying was observed on such plants. The present finding is also in conformity with Khanvilakar *et al.* (1983) who observed that the rice blue beetle feed mainly on host plants belonging to family Poaceae (Graminae) including vetiver, volunteer rice plants, ratoon rice and even on sugarcane planted near by infested area. They found that the adult beetle

Table 1. Suitability of weeds as alternative hosts of *L. pygmaea*

Local name	Common name	Botanical name	Family	No. of eggs laid	Hatching of eggs (%)
Inchipullu	Torpedo grass	<i>Panicum repens</i>	Poaceae	12-15	100
Varinellu	Wild rice	<i>Oryza rufipogon</i>	Poaceae	-	-
Naringa	Not known	<i>Isachne miliacea</i>	Poaceae	5-8	Nil
Polla	-do-	<i>Sacciolepis interrupta</i>	Poaceae	-	-
Kavada	Jungle rice /Awnless barnyard grass	<i>Echinochloa colona</i>	Poaceae	-	-
Mungu	Globe finger rush	<i>Fimbristylis miliacea</i>	Cyperceae	-	-
Neelolppalam	Pickerel weed	<i>Monochoria vaginalis</i>	Pontederiaceae	-	-
Nagappola	not known	<i>Limnocharis flava</i>	Limnocharitaceae	-	-
Kulavazha	Water hyacinth/ Lilac devil	<i>Eicchornia crassipes</i>	Limnocharitaceae	-	-
Nellicheera	Blistering ammania	<i>Ammania baccifera</i>	Lythraceae	-	-

Table 2. Comparative biology of *L. pygmaea* on Jyothi, Aiswarya and *Panicum repens*

Host	Fecundity	Inculation period	Larva period (days)	Pupa period (days)	Total life cycle (days)	Longevity(days)	
						Male	Female
Jyothi	16.8	3.4	8.2	3.2	14.8	40.9	24.9
Aiswarya	14.3	3.4	8.2	2.9	13.8	36.7	24.7
<i>Panicum repens</i>	13.5	2.3	6.4	2.8	11.5	38.4	23.7

* Each value is a mean of 10 replications

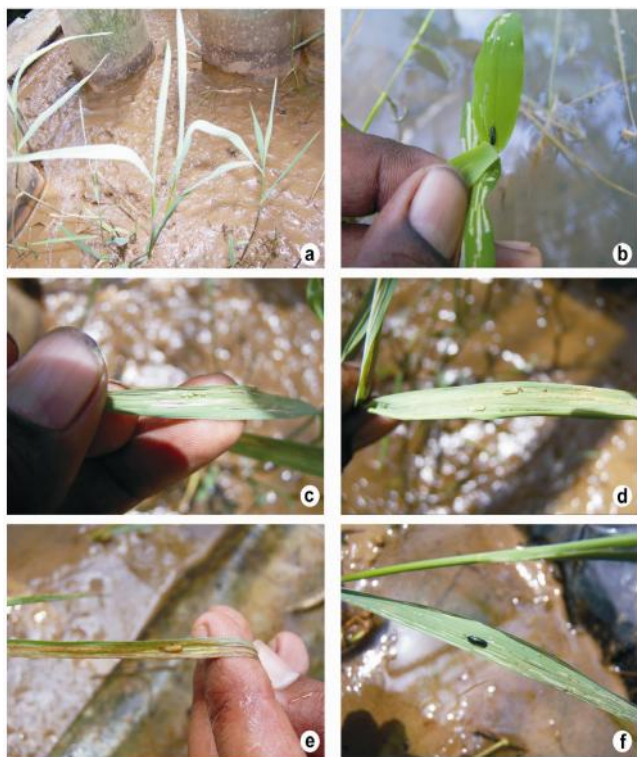


Fig. a: *Panicum ripens*, b: *Isachne miliacea*, c: Egg laying by blue beetle on *P. ripens* d: Larval feeding on *P. ripens*, e: Pupation on *P. ripens*, f: Adult feeding on *P. ripens*

survived on these host plants for 55-70 days during the off-season while in the present study, the adults were observed to survive for 24-38 days on *P. repens*. *Oryza rufipogon* and *P. repens* were also earlier reported as alternative hosts of *Dicladispa armigera* (Dutta and Hazarika, 1995) another chrysomelid pest attacking rice.

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