

Survival capacity of *Ceutorhynchus portulacae* Marshall during non-availability of food

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ABSTRACT: Forty-five days old adults of *Ceutorhynchus portulacae* Marshall could survive up to 55 days, hiding in cracks and crevices in soil which reflects their survival capacity in the absence of food when *Portulaca oleracea* was completely removed by mechanical or chemical means and can be a probable candidate for the biological control of this deadly weed.

KEY WORDS: *Ceutorhynchus portulacae*, *Portulaca oleracea*, survival, unfavourable periods

Purslane a plant of Central American origin is considered as the ninth World's weed, infesting about 45 crops in 81 countries of the world (Holms, *et al.*, 1977). In the tropical countries, it is of considerable importance in many upland crops including vegetables, maize, cotton, groundnut, sorghum, sugarcane, sunflower and rice (Waterhouse, 1994). In India, it ranks as a serious problematic weed of vegetables, vineyards and banana orchards, especially during the rainy seasons (Mandal, 1990; Chadha *et al.*, 1995). The curculionid weevil, *Ceuthorhynchus portulacae* was identified as a natural enemy that could be used for biological control of the weed. (Ganga Visalakshy and Jayanth, 1997).

Purslane being a serious crop weed is periodically subjected to cultural, manual and chemical removal, resulting in sudden loss of habitat for the weevils feeding on it. However, under field conditions the adult weevils were found to reappear on the weed indicating that they are capable of

surviving such adverse periods. A laboratory study was carried out to determine the survival capacity of *C. portulacae* adults during non-availability of food periods.

Ceutorhynchus portulacae adults of 0, 15, 30, 45 and 60 days old were enclosed in plastic jar (25x10 cm) separately with an aerated lid. The jar was filled with sterilized soil up to 5cm from the base. The top soil was covered with plant debris and sprinkled with few drops of water (1 ml) once in a day to provide moist conditions while the other set was kept without sprinkling any water. Observations were made at weekly intervals on the number of adults surviving, till all the adults were dead. The experiment was carried out with 50 adults per treatment, where each adult was taken as a replicate.

Ceutorhynchus portulacae adults were found to survive up to 55 days without food, moist soil when the soil was kept moist. Most of the adults

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could be seen hiding in the soil between the cracks, crevices and among the plant debris. The survival capacity was found directly related to the age of

The above results indicate that *C. portulacae* adults were able to survive without food for a prolonged period of 55 days. During this period,

Table 1. Survival capacity of *Ceutorhynchus portulacae* adults without food

Adult age	Per cent survival after days – when sprinkled with water									
	10	15	20	25	30	35	40	50	55	60
0 days	0	0	0	0	0	0	0	0	0	0
15 days	100	100	44	36	28	16	0	0	0	0
30 days	100	92	92	88	72	58	32	18	0	0
45 days	100	100	100	96	86	56	48	28	4	0
Per cent survival after days – when not sprinkled with water										
Adult age	10	15	20	25	30	35	40	50	55	60
Newly emerged	0	0	0	0	0	0	0	0	0	0
15 days	0	0	0	0	0	0	0	0	0	0
30 days	13	0	0	0	0	0	0	0	0	0
45 days	19	2	0	0	0	0	0	0	0	0

the adult released. The duration of survival was found to decrease with the increase in period of exposure time (Table 1).

Newly emerged adults, which have not fed sufficiently on *P. oleracea* were found not capable of surviving for a longer period on non-availability of food. Cent percent mortality was recorded within a week. Similarly, moisture was found to enhance the survival capacity of the insects during unfavorable periods. For when *C. portulacae* adults were released into jars where the soil was not moistened, all the exposed adults died within 15 days.

When 15 days old adults were kept without food, 44 per cent was alive up to 20th day, which decreased to 36, 28 and 16 and 0 percent by 25th, 30th, 35th and 40th day, respectively (Table 1). In adults of 30 days old resulted in 88 per cent survival up to 25th day that reduced to 72, 58, 32, 18 and 0 per cent by 30th, 35th, 40th, 50th and 55th day, respectively. The survival for 45 days old adults was 86 per cent for 30 days, which reduced to 56, 48, 28, 4 and 0 % for 35th, 40th, 50th, 55th and 60th day, respectively.

they remain hidden in places such as cracks and crevices in the soil or underneath the stones and migrate to the field with the infestation of the weed. This explains for the reappearance of adults on the weed in a short period.

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