

Influence of Various Diets on the Longevity and Emergence of Adults of *Dirhinus anthracia* Walk. (Hymenoptera : Chalcididae) and *Trichopria* sp. (Hymenoptera : Diapriidae) Parasites of *Exorista sorbillans* Weidemann (Diptera : Tachinidae)

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ABSTRACT

The longevity and emergence of male and female adults of *Dirhinus anthracia* and *Trichopria* sp. from uzifly pupae, fed on various diets such as water, 10% glucose, 10% sucrose, 10% jaggery, 10% honey, 10% yeast and 100% honey used for control were investigated. The life span of males and females of *D. anthracia* was highest when fed with 100% honey and least on water. The longevity of males and females of *Trichopria* sp. was better on 10% honey compared to other diets. But the survival rate of males and females of *Trichopria* sp. was least in control batches (100% honey). The emergence of male and female adults of *D. anthracia* was very high in control batches when compared to other diets. But it was least on water in females and on yeast in males. The emergence of males and females of *Trichopria* sp. was more on sucrose and very poor on 100% honey.

KEY WORDS : *Dirhinus anthracia*, *Trichopria* sp., Parasites, *Exorista sorbillans*, diet, influence

Exorista sorbillans Weid., is an endoparasite of the silkworm, *Bombyx mori* L. causing 15 to 20% damage to sericulture industry. This parasite was accidentally introduced into the previously unaffected sericultural tract of South India in 1980 from West Bengal (Jolly, 1981). Since then, this parasite has become a major problem in mulberry silkworm growing. Several hyper parasites of this parasite like *Nesolynx thymus* Girault, *Exoristobia philippinensis* Ashmead, *Trichopria* sp., and *Dirhinus anthracia* Walker were reported earlier (Pradip Kumar *et al.*, 1986; Veeranna *et al.*, 1987 a, b; Veeranna and Jyothi, 1989).

A knowledge of dietary requirements is necessary for efficient rearing of insects for research, mass production of beneficial insects for use in the pest management (Gingrich, 1972), and attracting the natural enemies and sustaining their fecundity by providing food in the field (Hagen *et al.*, 1971). The results of the present investigation revealed the influence of

different sugars, protein and water on the longevity and emergence of adults of *D. anthracia* and *Trichopria* sp.

MATERIALS AND METHODS

Dirhinus anthracia and *Trichopria* sp. cultured in the laboratory were used for the present investigation. Three replications of five each of male and female *D. anthracia* and *Trichopria* sp. were taken separately into 250 ml glass beakers to study the longevity and emergence of adults from the uzifly pupae parasitised by these females fed on various diets such as water, 10% glucose, 10% sucrose, 10% jaggery, 10% honey and 10% yeast. Pure honey (100%) was fed to the control batches, since it has very little effect on oviposition (Finney, 1948; Hagen, 1950). Four-day old uzifly pupae were exposed for parasitisation to the females of *D. anthracia* and *Trichopria* sp. which were fed on various diets soaked in sterilised cotton pads placed

on the top of glass beakers covered with muslin cloth. The longevity of males and females and emergence of adults from uzifly pupae infested by the females maintained on above diets were also recorded. The temperature and relative humidity recorded in the laboratory during the experiment ranged from 24° to 30°C and 52 to 92 per cent respectively. The data were analysed statistically using multiple variance test (ANOVA) at 5% significance level.

RESULTS AND DISCUSSION

The longevity of male and female adults of *D. anthracia* was highest when fed with 100% honey, whereas it was least on water in case of males and yeast in females (Table 1) and similar findings were reported in *Anastatus semiflavus* (Barnes, 1944), *Aptesis basizonia*

(Finlayson and Thelma, 1957), *Encarsia formosa* (Van Lenteren *et al.*, 1987), *Anagrus incarnatus* (Chantarasa *et al.*, 1984), *Exoristobia philippinensis* and females of *Nesolynx thymus* (Veeranna and Nirmala, 1989).

Longevity of male and female adults of *Trichopria* sp. was higher when fed with 10% honey than 100% honey. But it did not differ significantly when glucose was compared with sucrose, yeast and 10% honey in males. In females, significant difference was observed when water was compared with 10% and 100% honey and when 100% honey was compared with sucrose and 10% honey (Table 2). Syme (1975) reported that sugar solution increased the longevity of *Hyssopus thymus* but significant difference was not found when the same sugar solution was fed to *Echium vulgare*. He also reported that the

Table 1. Longevity and emergence of *Dirhinus anthracia* on various diets

Diets	Longevity in days		Emergence of adults	
	Males	Females	Males	Females
Water	8.73 ± 3.87	13.80 ± 1.19	2.80 ± 0.57	1.46 ± 0.06
10% Glucose	23.13 ± 2.31	26.26 ± 1.72	1.40 ± 0.12	4.60 ± 0.35
10% Sucrose	29.93 ± 1.66	34.33 ± 1.25	8.86 ± 0.56	8.40 ± 0.35
10% Jaggery	34.80 ± 0.77	35.60 ± 1.15	4.80 ± 0.37	7.46 ± 0.29
10% Yeast	11.40 ± 0.69	12.40 ± 0.65	1.36 ± 0.06	4.66 ± 0.33
10% Honey	34.26 ± 1.70	41.80 ± 1.13	3.80 ± 0.12	6.40 ± 0.31
100% Honey (control)	49.93 ± 0.46	51.26 ± 0.54	25.33 ± 2.40	74.66 ± 2.46
LSD (P=0.05)	3.81	5.96	2.78	2.95

Table 2. Longevity and emergence of *Trichopria* sp. on various diets

Diets	Longevity in days		Emergence of adults	
	Males	Females	Males	Females
Water	5.66 ± 0.46	5.46 ± 0.56	53.00 ± 4.20	17.40 ± 3.30
10% Glucose	6.20 ± 0.45	5.53 ± 0.45	43.26 ± 1.67	13.66 ± 0.55
10% Sucrose	7.20 ± 0.50	6.86 ± 0.89	95.90 ± 1.01	68.83 ± 1.69
10% Jaggery	5.13 ± 0.21	5.20 ± 0.20	79.46 ± 3.64	24.60 ± 3.58
10% Yeast	6.00 ± 0.45	6.66 ± 0.42	40.60 ± 3.06	28.60 ± 5.42
10% Honey	7.40 ± 0.55	7.73 ± 0.53	63.40 ± 4.10	22.60 ± 5.60
100% Honey (control)	2.86 ± 0.20	3.26 ± 0.23	14.20 ± 2.00	10.60 ± 1.50
LSD (P=0.05)	2.12	2.75	9.97	11.26

addition of sugars to *Chrysanthemum leucanthemum*, *Epilobium angustifolium* and *Fagopyrum esculentum* increased the longevity of *H. thymus* to a level significantly different from that of control and with *C. leucanthemum* it significantly increased the longevity over that obtained in water.

The fecundity of *Chrysopa carnea* was increased when the artificial diet contained the hydrolyzate of yeast in addition to honey (Sundby, 1967). Tauber and Tauber (1974) reported that five predaceous insects viz., *C. nigricarnis*, *C. quadripunctata*, *C. dowensi*, *C. lanata* and *Symphorobius amicus* depended on a diet other than sugar and water for sustaining high fecundity. The present study revealed that the emergence of males and females of *D. anthracia* was highest on 100% honey compared to other diets. In males, significant difference was observed when water was compared with glucose, jaggery, yeast and 10% honey. It was also found that significant difference did not exist when glucose was compared with jaggery, yeast and 10% honey (Table 1). The emergence of male and female adults of *Trichopria* sp. was highest on sucrose when compared to other diets. However, it was very low on 100% honey (control) in both the sexes (Table 2).

It is evident from the results of the present investigation that the life span and emergence of males and females of *D. anthracia* can be enhanced by feeding 100% honey. The males and females of *Trichopria* sp. however, required 10% honey and sucrose respectively, for survival and multiplication.

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