Table 1 *Development of pearl millet ergot in detached earheads.*

Treatment	Incubation* period (days)	Ergot* incidence (%)
High RH during day alternating with low RH during night	7.26	41.66
High RH during night alternating with low RH during day	5 73	66.66
Continuous high RH	—	0
Continuous low RH	—	0
Control (uninoculated)[a]	—	0

* Mean of three replications; [a] maintained separately with each of the four treatments

It is evident from table 1 that the disease was successfully reproduced in detached earheads. Incubation period was lower and incidence was higher when inoculated earheads were subjected to high RH during night alternating with low RH during day as compared to the reverse treatment. The disease failed to develop in the remaining two treatments. Earheads kept under continuous high RH were covered with growth of some saprophytic fungi while those kept under continuous low RH dried up within 2 to 3 days. The disease did not develop in control earheads.

This is the first report of detached earhead culture of *Claviceps fusiformis*. The technique may help in a better understanding of various factors affecting infection and development of pearl millet ergot.

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MANGIFERIN—A PHENOLIC GROWTH INHIBITOR

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PHENOLIC compounds are important secondary plant metabolites. Substances belonging to various groups of phenolics like simple phenols, phenolic acids, cinnamic acids, coumarins and flavonoids have been shown to act as growth-regulating compounds. The literature concerning this aspect was reviewed by several workers[1-4].

Xanthones are an important group of phenolics and are structurally related to flavonoids, but are restricted in distribution[4]. Mangiferin (2-C-glucoside of 1, 3, 6, 7-tetrahydroxyxanthone) is a unique xanthone in having a much wider natural occurrence[4]. In the present study the effect of mangiferin on the growth of a duckweed *Lemna paucicostata* Hegelm, was investigated.

L. paucicostata stock cultures maintained on modified Bonner and Devirian medium[5] were used for the present investigation. The medium (100 ml without sucrose) was poured into 250 ml Erlenmeyer flasks and autoclaved. Mangiferin was dissolved in a small quantity of ehtyl alcohol and was added to flasks to obtain concentrations of 0.01, 0.05, 0.1, 0.5 and 1.0 ppm (care was taken to equalize the amount of alcohol to 0.02 ml for all treatments including the control). Ten *Lemna* plants were introduced into each flask. Cultures were maintained at a light intensity of 5000 lux and 25 ± 1°C temperature. Growth was estimated at the end of 10 days in terms of fresh weight and number of plants.

Table 1 *Effect of mangiferin on the growth of L. paucicostata*

Growth criterion	Concentration in ppm					
	0 0	0.01	0.05	0 1	0.5	1.0
Fresh weight in mg/flask	589	568	501	433	342	257
No of plants/ flask	327	316	271	234	197	143

F and C. D. values of the data (for which the means of 5 replicates are given above) are as follows:

	F	C. D.
Fresh wt	397 18*	19 06
No. of plants	154.06*	16 66

* Value is significant at 1% level of significance.

Mangiferin markedly inhibited the growth of *Lemna* (table 1). With the increase in the concentration, the inhibition was more pronounced. The present study adds mangiferin, a xanthone, to the list of phenolic growth inhibitors.

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OBSERVATIONS ON THE HOST PREFERENCES OF *CLETUS BIPUNCTATUS* WESTE. (HETEROPTERA: COREIDAE) ON SOME AMARANTACEOUS HOST PLANTS

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BIOLOGICAL aspects of coreids feeding on Amarantaceous plants are not on record, but *Cletus bipunctatus* Weste. has been observed feeding and breeding on the immature seeds and flowers of *Amarantus spinosus* Linn., *Amarantus viridis* Linn. and *Gomphrena decumbens* Facq.

Adult of *C. bipunctatus* was seen to mate 5–7 days after emergence, the pairs remaining in copula for a period of 2–3 hr and repeated mating occurred before oviposition. The preoviposition period was 3–5 days and the eggs were laid singly on the inflorescence as well as on the adaxial and abaxial surface of the leaves. Each female laid about 83–117 eggs during its average life time of 31 days.

The time taken for the development of immature stages varied with the host plants. It was 21.19, 22.48 and 23.96 days and fecundity 117, 102 and 83 when *C. bipunctatus* fed on *G. decumbens*, *A. spinosus* and *A. viridis* respectively (table 1).

Growth studies of *C. bipunctatus* on the three host plants were made using Huxley's[1] formula, $Y = bx^k$, where 'Y' represents the total length of the body, 'x' the length of the body parts, 'b' the initial growth index and 'k' the growth ratio. With all the three host plants, the growth pattern of different organs conformed to the simple law of allometry and the growth ratios were greater for the females than for the males. The growth rate in terms of the total body length of the adult revealed a maximum body length for individuals that fed on *G. decumbens* followed by *A. spinosus* and *A. viridis*.

Variation in the growth and reproductive rates on different host plants appears to be due to physiological conditions of the host plant which provide food of variable nutritional quality. Therefore host plant preferences in terms of biochemical parameters were studied with particular reference to protein[2], carbohydrate[3], phenol[4], and nitrogen[5] contents of the inflorescence of the three host plants. The importance of organic nitrogen[6], sugars and proteins[7], and phenol[8] in host plant selection by phytophagous insects is very well known. Biochemical analysis revealed maximum nitrogen, carbohydrate and phenols in *A. viridis* followed by *A. spinosus* and *G. decumbens* (table 1). Van Emden[9] stated that increased nitrogen content increased the fecundity and survival of aphids. Post-embryonic studies indicated that the growth rate and fecundity were greater when reared on *G. decumbens* than on *A. spinosus* and *A. viridis*. Even though *A. viridis* contained a greater amount of proteins and nitrogen, the fecundity and growth rate were low due to high amounts of sugars and phenols. Therefore, the preference of *C. bipunctatus* to *G. decumbens* may be presumed to be due to low levels of sugars and phenols, even though it had lesser amounts of nitrogen and proteins.

The author wishes to express his deep sense of

Table 1 *Duration of development, fecundity of Cletus bipunctatus and chemical analysis of host plants*

Host plant	Duration of development in days	Fecundity	Proteins (mg/g)	Phenol (mg/g)	Carbohydrate (mg/g)	Nitrogen (%)	Carbohydrate/ Protein ratio
Amarantus viridis	23.96	83	52 46	212.26	916.26	5.75	17 47
Amarantus spinosus	22.48	102	44.16	160.00	895.67	3.25	20.29
Gomphrena decumbens	21.19	117	42.33	141.67	816 67	1.75	19 29