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AGE-RELATED LIPID STUDIES IN BRUCHIDS

THE lipids comprise 38·2% and 45·7% in females and males of *Zabrotes subfasciatus*; 32·3% and 36·9% in females and males of *Callosobruchus maculatus* respectively. Although there is a decrease in the lipid content with advancing age of bruchids, but no qualitative changes were observed. Relative high lipid content may be regarded as an adaptation to their non-feeding habit after emergence.

During the process of embryogenesis, post-embryonic development, metamorphosis and aging, lipids serve as an important source of energy[1,2], as the energy liberated by lipid molecules is more than that liberated by other macromolecules such as carbohydrates and proteins. Stored lipids are convenient reservoirs of metabolic energy. Analysis of lipids will suggest their role in aging bruchids.

Zabrotes subfasciatus Boh. and *Callosobruchus maculatus* Fabr. (Coleoptera: Bruchidae) were cultured[3] at 30° ± 1° C. For the present studies only fertile forms of *C. maculatus* were used. Triplicate samples of 100 bruchids, males and females separately, were taken at 24 hr intervals throughout the adult life, *i.e.*, from one day after emergence till sixth day. Lipids were extracted with petroleum ether (60°–80° C) in a Soxhlet for 24 hr. For qualitative lipid analysis and to study age-related changes in lipid classes, thin layer chromatography (TLC) was used. Plates (0·5 mm thick) were made of silica gel G. Solvent system used for TLC of neutral lipids comprised of petroleum ether (60°–80° C), solvent ether and acetic acid (90 : 10 : 1); for phospho- and brain-lipids, it comprised of chloroform, methanol and ammonia (75 : 25 : 4)[4]. The spots were developed with iodine, and were characterized using standards, which were run along with the samples.

Fast[5] recorded less than 10% lipids in three quarters of insects studied, but in *Z. subfasciatus* the lipids comprise 38·2% in females and 45·7% in males; and in *C. maculatus* 32·3% in females and 36·9% in males (Fig. 1) on the first day after emergence. Relatively high lipid content of bruchids may be regarded as an adaptation to their non-feeding habit after emergence. The non-feeding adults of *Lymantria dispar* contain even 55% lipids[6].

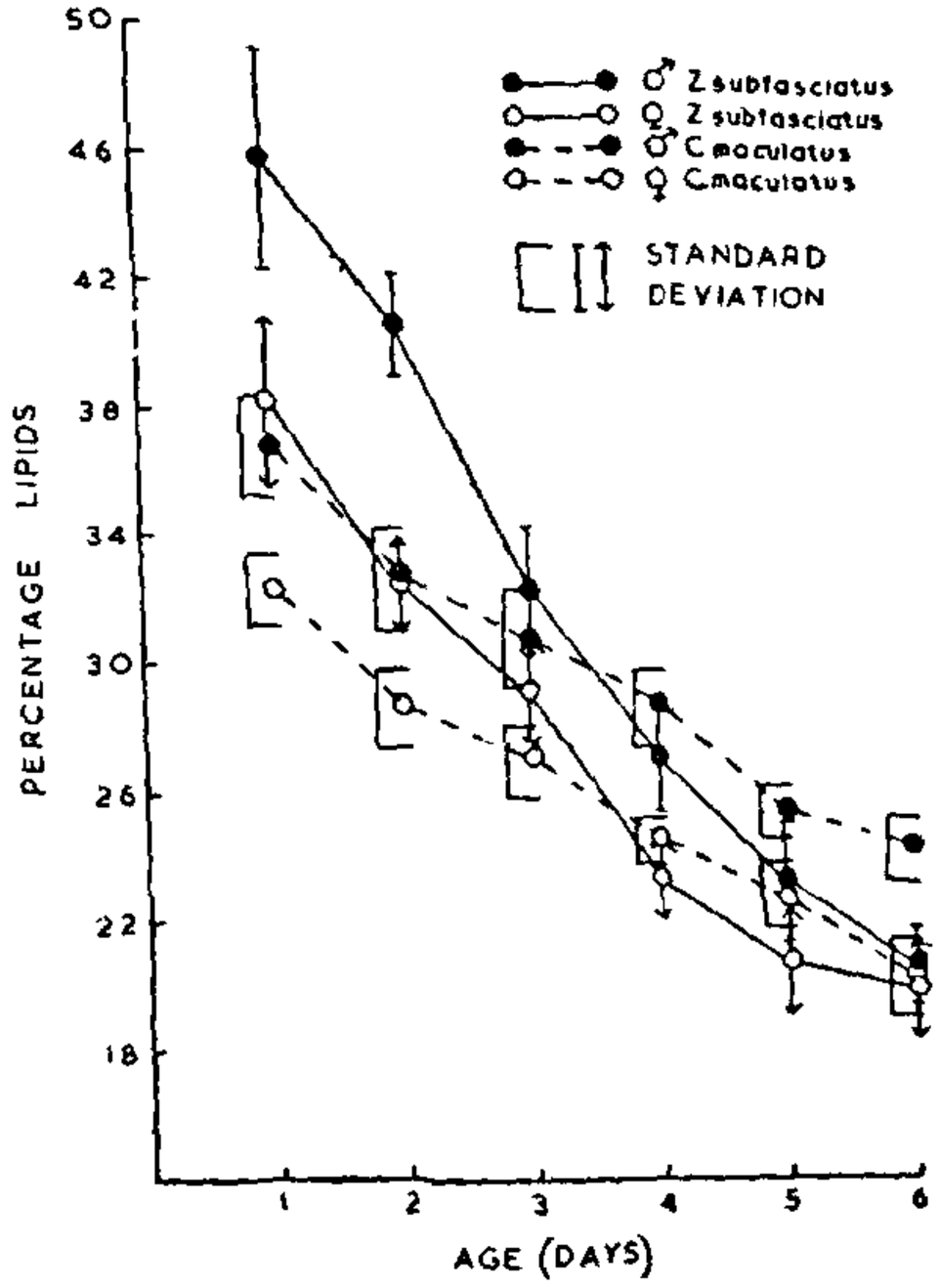

FIG. 1. Age-related changes in percentage lipid content of bruchids.

There is decrease in lipid content of bruchids with age. Similar observations have been made for *Lymantria dispar*[6] and *Sarcophaga tibialis*[7]. Males of the bruchids utilize more lipids than females. Higher energy needs for males than for females have been observed in *Aedes aegypti*[8]. Such a possibility may be envisaged in the present case also.

Neutral lipids of these bruchids comprise monoglyceride, 1,2-, 1,3-diglycerides, triglycerides, fatty acids, cholesterol and cholesterol esters. Among the phospholipids, lecithin and phosphatidyl ethanolamine are present. In addition, cerebrosides were also detected. There is no qualitative difference between the lipids of either the two types of bruchids or between the male and female of each species.

Besides serving as fuel for the aging organism, lipids play a role in the aging process by yielding free-radicals on oxidation[9]. These free radicles bring about the crosslinkage of macromolecules, making them non-

functional and thus promote the aging of organisms[10]. No qualitative changes in lipids with advancing age of the bruchids were observed and the present study shows that lipids are used to provide energy to the bruchids during aging.

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SEASONAL VARIATION IN THE AIR-BORNE ALGAE OVER A RURAL AND AN URBAN AREA

THE incidence of pollen and fungal spores in the air and their importance in allergic disorders is now well recognised. Both aquatic and terrestrial algae were recorded in the airspora[1,2] and their magnitude seems to vary from place to place. The allergenicity of these air-borne algae is also established[3,4]. Gregory and Sreeramulu[5] reported a very high concentration of *Gloeocapsa* over an estuary of Thorney Island in U.K., whereas Gregory *et al.*,[6] found fewer colonies in an interior land site at Harpenden and London. In India, there are very few studies on algal aerobiology eventhough the climate is favourable for algal spores and fragments to be air-borne[1,2,7]. This comparative study deals with seasonal variation in the air-borne algae at two different sites, 10 km apart; Mydanahalli village, typical representative of rural area and Manasagangotri, Mysore, representative of an urban area.

Vertical cylinders were used as spore traps[8] 4 m above the ground level at Mydanahalli village and 8·2 m at Manasangangotri. The data were obtained by microscopic examination of samples under low power objective.

The algal groups were identified as chlorophycean and cyanophycean members. The chlorophyceae are mainly represented by coccoid genera *Protococcus* and *Chlorella* and filamentous forms *Spirogyra* and *Ulothrix*. The cyanophycean group was represented by coccoid cells of *Gloeocapsa* and filaments of *Lyngbya* and *Oscillatoria*. The data presented in Table I

TABLE I

Occurrence of air-borne algae at two different sites in Mysore during 1977 *and* 1978 (*Expressed in No./cm²*)

Months	Mydanahalli village				Manasagangotri campus			
	1977		1978		1977		1978	
	Chloro-phyceae	Cyano-phyceae	Chloro-phyceae	Cyano-phyceae	Chloro-phyceae	Cyano-phyceae	Chloro-phyceae	Cyano-phyceae
January	4	30	44	9	..	..	..	..
February	89	4	3	35	4	57	64	..
March	65	55	6	36	..	..	..	..
April	97	4	102	42	..	..	..	3
May	157	..	6	6	..	..	..	6
June	185	..	96	10	..	..	3	..
July	82	4	30	7	..	..	..	..
August	51	4	119	4	4	..	..	..
September	19	4	..	21	4	..	..	..
October	46	121	..	..	..	..	..	..
November	44	..	40	36	..	..	..	..
December	150	30	21	12	..	..	..	..
Total	993	256	467	218	12	57	67	9
Number of days with catches	42	26	33	25	3	2	2	2