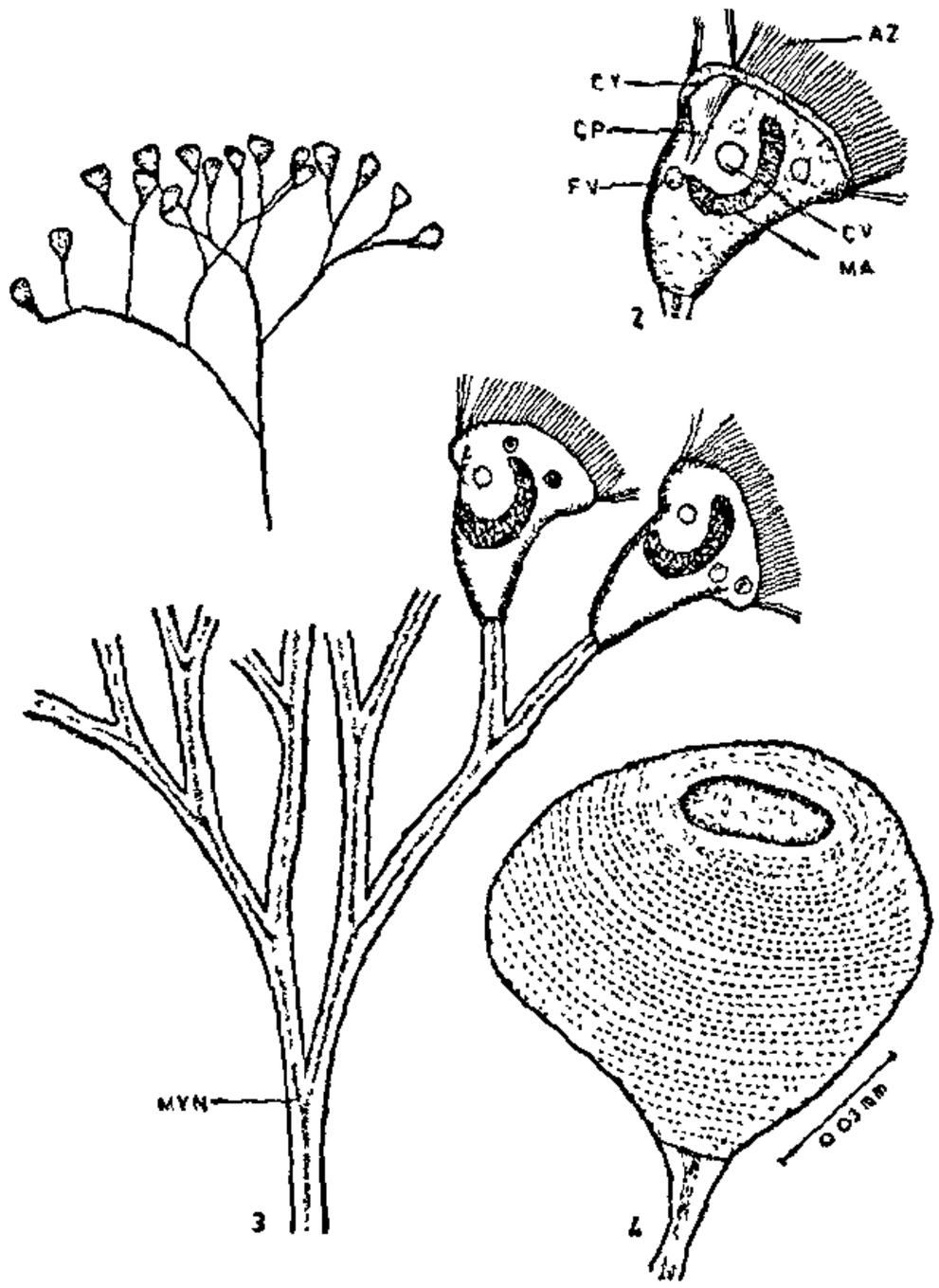
OBSERVATIONS ON A RARE CILIATE *ZOOTHAMNIUM DICHOTOMUM* WRIGHT-KENT 1882, ATTACHED TO *INDOPLANORBIS EXUSTUS*, FROM INDIA

DURING the systematic survey of protozoans in a stream 6 kms north of Waltair, Andhra Pradesh (India) it has been observed that the *Zoothamnium dichotomum* colonies lie attached to the gastropod *Indoplanorbis exustus* Desbaye. The usual location of the *Z. dichotomum* hitherto reported is floating vegetation. In the present study generally 4 to 8 colonies have been noticed on each gastropod. This association could be commensalism (ecto-commensalism). This has been observed more frequently during the months of July, August and September than in other months. Another interesting feature which we have observed is that 80% of the snails associated with *Z. dichotomum* colonies carried cercarial infections. *Z. dichotomum* (Figs, 1, 2, 3 and 4) is a rare and beautiful peritrichous ciliate. This is the first report of the ciliate from the Indian sub-continent. Body campanulate or elongate-conical, peristomial border well dilated but not eversible. Cuticular surface smooth or feebly striated transversely. Colony with dichotomus branching (Fig. 1). Ciliary disc moderately elevated. Contractile vacuole single. Macronucleus band-like curved, short transversely disposed with a small rounded micronucleus placed close to it. Myonemes (Fig. 2) of all the stalks of a colony are continuous with one another, so that the entire colony can contract or expand simultaneously.



FIGS. 1–4. Fig 1. Diagrammatic representation of the entire colony of *Zoothamnium dichotomum* showing dichotomus branching. Fig. 2. Live animal under phase contrast microscope: AZ—adoral zone, CY—cytostome, CP—cytopharynx, FV—food vacuole, CV—contractile vacuole, MA—macronucleus, Fig. 3. Arrangement of myonemes in the stalks. Fig. 4. Infraciliature of the zooid (after Klein's. Dry silver method).

The silver line system (Fig. 4) of the individual zooid is as shown in the figure (after Klein's Dry silver method[1]). Kent[2] made a report on this species, there has been no other report. However, Kahl[3] redescribed it.

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P. RAMA MOHANA RAO.
K. HANUMANTHA RAO.
K. SHYAMASUNDARI.

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EFFECT OF RESERPINE ON ACID AND ALKALINE PHOSPHATASE ACTIVITIES OF RAT BRAIN

LEVELS of acid and alkaline phosphatases have been estimated in the different parts of rat brain after reserpine administration for various durations. Significant lowering of enzyme activities occurred in the mid brain after 6 days of drug administration. Reserpine administration for longer duration (upto 18 days) showed an enhancement of the acid phosphatase and depletion of alkaline phosphatase activity in all parts of the brain.

Brain is a heterogeneous tissue both anatomically and histologically. This heterogeneity is of great importance in the evaluation and interpretation of biochemical findings[1]. Acid and alkaline phosphatases are well known to be involved in various secretary and transport processes[2,3] but their precise role still remains obscure. The sedative property of reserpine is responsible for changes in the brain levels of 5-hydroxy tryptamine and catecholamines[4]. The process of synthesis and release of these neuro-transmitters involves a number of metabolites and enzymes of which phosphatases are important[5]. Therefore in the present investigation the effect of reserpine on the acid and alkaline phosphatases in the rat brain was studied.

TABLE I

Effect of reserpine on the acid and alkaline phosphatase activities in various regions of rat brain

(Values are mean ± S. E. and expressed as μg p/100 mg/h.)

Nature of Animals	No. of Animals	Period of treatment in days	Compartments of the brain							
			Cerebrum		Midbrain		Cerebellum		Medulla Oblongata	
			ACP	ALP	ACP	ALP	ACP	ALP	ACP	ALP
Control	10	..	85·93± 9·33	153·12± 8·26	109·37± 6·50	185·93± 8·60	53·12± 9·71	89·06± 6·92	76·56±7·81	126·56± 6·44
	4	1–6	98·43±13·59	228·12±14·54	56·25±13·50	135·93± 7·38	56·25± 7·65	140·62±6·50	78·12± 6·50	164·06± 4·68
Reserpine treated	4	1–12	129·68± 6·92	164·06 ±4·68	98·43± 6·92	129·68± 6·92	93·75± 9·19	132·81± 4·68	90·62±11·55	140·62± 6·50
	4	1–18	160·93± 6·92	120·31± 6·92	106·25± 7·65	78·12± 6·50	137·50± 7·65	70·31± 4·68	153·12±5·98	68·75± 5·70

ACP = Acid phosphatase.
ALP = Alkaline phosphatase.

Colony-bred Swiss albino rats (150 ± 10 gm) were divided into four groups. They were maintained under uniform husbandry conditions throughout the experimental period. First, second and third groups of rats were administered subcutaneously 100 μg/100 gm body weight 'Serpasil' (Ciba) daily for 6, 12 and 18 days respectively. Fourth group was injected with the vehicle (distilled water) only and treated as control. Animals were killed by decapitation after 48 h of last injection. Brain was divided into four parts, *i.e.*, cerebrum, midbrain, cerebellum and medulla oblongata. Method of Fiske and Subba Row[6] (Cited by Hawk *et al.*,[7]) was adopted for the estimation of acid and alkaline phosphatases. The results were statistically analysed using student '*t*' test.

The levels of acid and alkaline phosphatases in the control and treated rats are shown in Table I. In control group the amount of phosphatases is highest in the midbrain and lowest in the cerebellum, however, other parts of the brain also exhibit appreciable amounts of these enzymes. Administration of reserpine for short duration (1–6 days) results in a significant depletion of phosphatases activity in the midbrain ($P < 0.01$, $P < 0.001$) while in other parts of the brain the enzyme activity especially alkaline phosphatase increases significantly ($P < 0.001$). It is also observed that by increasing the duration of the drug (1–12 and 1–18 days) the acid phosphatase activity in all the parts of the brain increases while alkaline phosphatase activity decreases.

Brodie and Shore[5] studied the action of reserpine on the release of 5-hydroxy tryptamine in free form from depot in the brain and also considered it to be a possible central parasympathetic transmitter. Pletscher *et al.*[8], observed that reserpine caused a severe loss of 5-HT from the hypothalamus. Plummer *et al.*[9], suggested that reserpine inhibit certain hypothalamic centres and therefore, might have wide spread actions mediated through the endocrine system. It may be for this reason that the acid and alkaline phosphatases which are hormonal dependent are greatly influenced[10]. The restoration of phosphatase activity after prolonged administration of the drug reflects upon the adaptibility of the nervous tissue.

School of Studies in Zoology, Jiwaji University, Gwalior 474 002, India,
B. L. Yadav.
R. B. Gupta.
R. Mathur.

June 14, 1979.

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A PERFUSION FLUID FOR THE FRESHWATER CRAB, *BARYTELPHUSA GUERINI* MILEN EDWARDS

Physiological salines with necessary ionic concentration and osmotic pressure are widely used for allowing the cells to survive in them without damage[1]. A number of physiological salines or 'Ringer' solutions are available for different animals including crustaceans[2,3]. However, such perfusion fluids are not available for many freshwater crustaceans. It is assumed that either Van Harreveld's[4] or Prosser's[5] saline for *Cambarus* would prove satisfactory for most freshwater crustaceans if the total concentration is adjusted to isotonicity with the blood of the experimental species[2].

During the course of studies on the freshwater crab, *Barytelphusa guerini*, it was found that both Van Harreveld's and Prosser's salines were not satisfactory for this animal as the heart beat in *in situ* preparations stopped within 30–45 min and preparation of a new perfusion fluid suitable for this crab was necessary. The concentration of individual ions in the blood determined earlier[6,7] was as follows (mM/litre) = sodium—406·30, potassium—5·59; calcium—3·07; magnesium—0·84, chloride—200·14; sulphate—10·74, phosphate—0·22 and pH—7·70. A perfusion fluid of the following composition was prepared based on this blood composition,

Sodium chloride	..	16·09 g
Potassium chloride	..	0·4157 g
Calcium chloride	..	0·3402 g
Magnesium chloride	..	0·0803 g
Sodium sulphate	..	1·5261 g
Sodium bicarbonate	..	0·2800 g
Glucose	..	0·6000 g
Distilled water	..	1000 ml
pH	..	7·7