sensilla basiconica, as in some Diptera, Lepidoptera, Hymenoptera and Coleoptera[7].

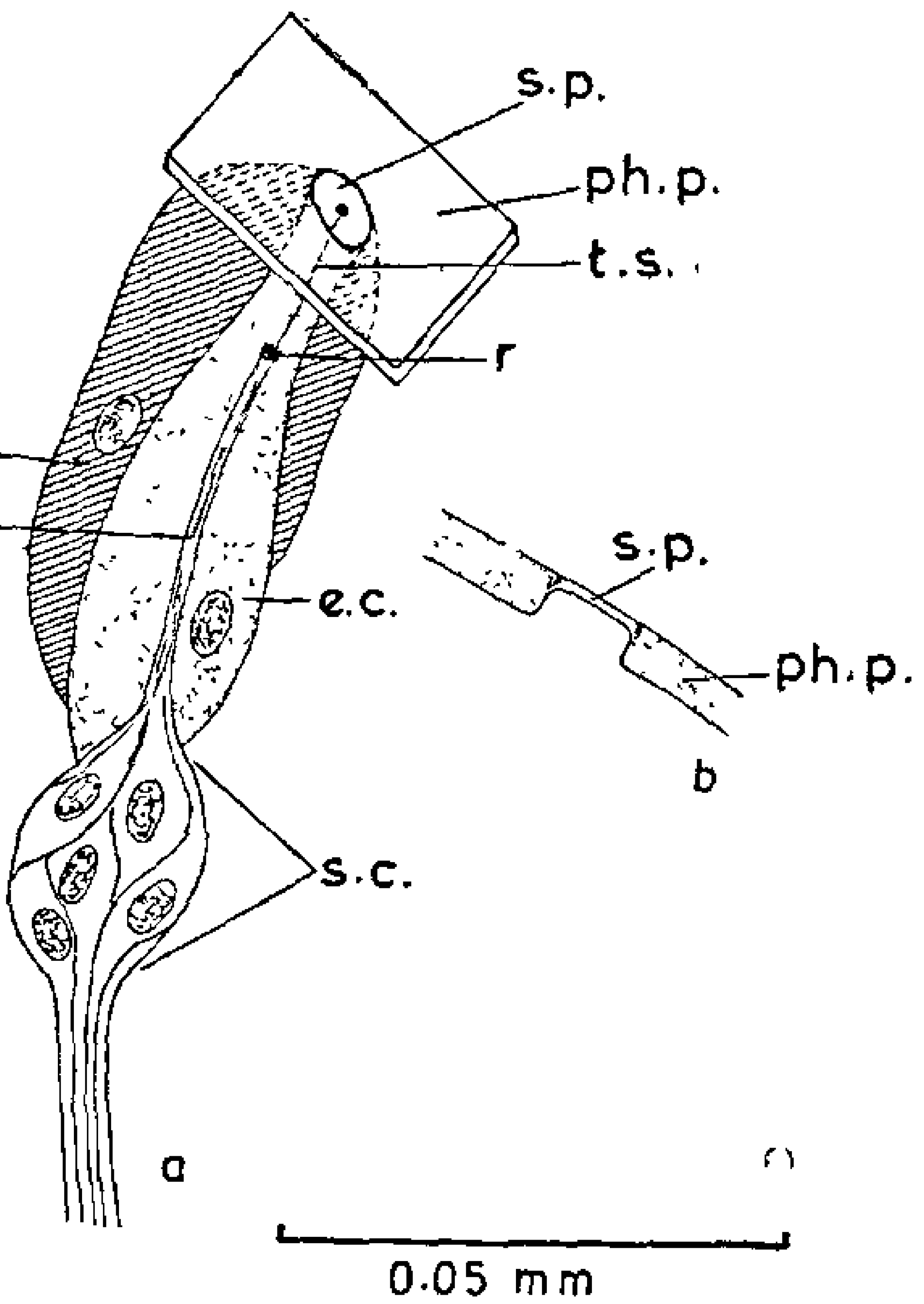

FIG. 3 *a*, *b*. Diagrammatic sketch of sensillum placodeum and the sense plate.

The pharyngeal sense organs are present in most hymenopterans, but in ants these appear to be more deep-seated. In ants, the food is first received in the infra-buccal pouch (Fig. 1, *i.b.p.*) and then passes to the pharynx *via* a long food meatus. Other hymenopterans have a relatively shorter food meatus. The pharyngeal sense organs in those cases might serve only for taste. However, the deeper location of pharyngeal sense organs in *C. compressus* suggests that these may have an additional role to play. In ants, the food collected by a worker is shared with the other nestmates including males, females and also the larvae. The regurgitative feeding behaviour in adult ants can be initiated or terminated by either the donor or the acceptor. The antennae and forelegs are used in the correct orientation of the ants and in regurgitation[8].

It is known that the workers lick up secretions of larvae from the body which are apodous and lack antennae. It is believed that the act of licking stimulates the workers to offer food to the larvae. At this stage it is not possible to identify the pathway which results in disgorging of the food by the workers, although a connection exists between the sense organs and the sympathetic nervous system *via* labral nerve and the frontal ganglion.

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NEUROCHEMICAL CORRELATES OF ALLOXAN-DIABETES: CHANGES IN THE AMINOTRANSFERASE ACTIVITY IN THE BRAIN STEM REGION OF FROG

INFORMATION concerning the changes in enzyme activities during alloxan-diabetes in various tissues of mammals is vast[1-6]. However, very little information is available on the activities of various enzymes in amphibians during alloxan-diabetes[7,8]. Since the brain stem showed profound changes compared to other regions of the brain in certain biochemical parameters[9,10,11] (like levels of protein, glycogen and RNA) during the course of our present investigation on neurochemical correlates of alloxan-diabetes, it was felt desirable to initiate the present study. Since alloxan-diabetes induces significant changes in protein[11] and RNA[11] levels in the frog, *Rana cyanophlictis*, it is likely that aminotransferases, which are known to link amino acid and carbohydrate metabolism[12], should also be affected. Hence, in the present investigation, the activity levels of Aspartate aminotransferase (AAT, E.C. 2.6.1.1) and Alanine aminotransferase (AlAT, E.C. 2.6.1.2) were studied in the brain stem of frog, on inducing alloxan-diabetes.

Frogs, *Rana cyanophlictis*, of medium size (22–26 g) were maintained in the laboratory (25 ± 2° C) in glass aquaria in tap water. Diabetes was induced by intramuscular injection of alloxan monohydrate as described earlier[11].

TABLE I

Aminotransferase activities in proportion to enzyme concentration in the brain stem of normal and diabetic frogs

Enzyme Concn. in mg	AAT		AlAT	
	Control	Experimental	Control	Experimental
2	0·11 ±0·002	0·14±0·016	0·135±0·03	0·155±0 015
4	0 15 ±0·003	0·19±0·005	0·17 ±0 001	0·185±0·02
6	0·175±0 01	0·23±0·02	0·21 ±0·04	0·23 ±0·06
8	0·20 ±0·025	C·26±0·04	0·255±0·007	0·27 ±0·05
10	0·24 ±0·006	0·31±0 01	0·28 ±0·01	0·315±0·08

No. of observations 5 (Mean ± S.D.)
Values are expressed as micromoles of Ketoacid formed per mg tissue per hour.
Values are significant; $P > 0 \cdot 05$.

Frogs were decapitated and the brain was removed from the ventral side. The brain stem was separated using a sterilized scalpel by keeping the brain immersed in ice-cold frog's Ringer[13]. The tissues were weighed with Ringer in an electric balance and immediately used for analysis.

The activity levels of the aminotransferases were measured following the colorimetric procedure of Reitman and Frankel as described by Bergmeyer[14]. Blood glucose was estimated by the method of Folin[15].

The blood glucose level (54·6 ± 4·8 mg/100 ml) in 48 h alloxan-diabetic frog was 73% higher than in controls (31·5 ± 2·3 mg/100 ml). It is clear from Table I that the activity level of AlAT is higher then that of AAT in both normal and diabetic conditions. Further, marked elevation in the activity levels of AAT and AlAT in the brain stem of frog on inducing diabetes was noted (Table I).

The aminotransferase activities in various tissues are known to increase under several pathological and altered physiological conditions[12,16,17]. The associated physiological conditions are enhanced gluconeogenesis, increased protein catabolism and a rise in the amino acid pool[18].

An augmentation in the activity levels of aminotransferases observed in the present study during diabetes may be due to an increase in the free amino acid pools of the different regions of the brain of frog, *R. cyanophlictis* on inducing diabetes (Nayeemunnisa and Nagaraj, unpublished observations). It is of interest in this connection to note that the glutamic acid level exhibited dramatic increase (percentage change; 100–120% increase) over controls in the different regions of the brain of frog and rat during diabetes (Jayashree and Nayeemunnisa, unpublished data). It is, therefore, possible that the observed increase in the activity levels of AAT and AlAT is due to such a change occurring in the level of brain glutamic acid during diabetes.

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