TABLE I

Plasma potassium and ATPase activity in red cell stroma of hypoxic rats

(Data represent mean ± SEM. Figures in parentheses denote number of rats)

Group	RBC counts million/cmm	Potassium meq/litre	ATPase-pi literated in μg/hr/mg protein at 40°C	
			Basal	Na^+ K^+ activated
Control	5·6±0·2 (10)	6·4±0·1 (10)	1·7±0·16 (10)	2·1±0·2 (10)
Experimental	7·4±0·1 (10) $p < 0·001$	8·6±0·1 (10) $p < 0·001$	3·1±0·3 (6) $p < 0·01$	3·5±0·2 (6) $p < 0·01$

published report[13]. The observed increase in red cell membrane ATPase activity is probably responsible at least in part for the enhanced influx of ^{86}Rb in erythrocytes of acute hypoxic rats.

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OCCURRENCE OF NSUTITE (GAMMA-MnO_2) IN THE MANGANESE ORES OF SANGUEM DISTRICT, GOA, INDIA

THE area around Sanguem (15° 00′ 00″ and 15° 21′ 16″ N and 74° 04′ 00″ and 74° 15′ 00″ E) District of Goa is one of the important manganese mining areas of India. Fermor[2] (1909) and Dunn[1] (1942) were the earliest workers to study the area. A summary of their work is given by Pascoe[4] (1965). Majumdar[3] (1965) studied the mineralogy of the iron and manganese ores and has reported the presence of pyrolusite, cryptomelane, braunite and manganite from these ores. The present note reports the occurrence of nsutite, which has hitherto not been reported from this area.

Detailed field investigations of the manganese ores of Sanguem area have shown that the deposits are entirely restricted to the phyllites of the Dharwar Supergroup (Archaean). The ore is found as boulders and concretions or as pockets and lenses of varying dimensions in the lateritised phyllites, below which the phyllite is seen altered to lithomarge. The zone of lithomarge is followed downwards by a zone of wad of varying thicknesses and this, at depth, usually grades into a zone of powdery ore. This sequence constitutes the secondary deposits, in which nsutite is found. Rarely below the zone of powdery ore a parent rock rich in manganese is seen.

The manganese ore samples collected from different mines were subjected to ore microscopic examination, gravimetric thermal analysis, differential thermal analysis and X-ray analysis. These studies reveal the presence of braunite and jacobsite which are the primary minerals and pyrolusite, manganite, psilomelan and nsutite as the secondary minerals.

Under the ore microscope, nsutite is white to creamish in colour and consists of fine dusty looking aggregates or felted masses of fine delicate needles. The dusty aggregates appear nearly isotropic. Such aggregates sometimes show shrinkage cracks due to dehydration. The needle-like crystals show distinct anisoropism from grey to dark grey without development of colour and with more or less undulose extinction. Although no confirmatory etch test could be made due to its very fine grained nature, the mineral has been conclusively identified as nsutite by X-ray diffraction studies. It occurs as fine needles replacing psilomelane filling the interspaces of crushed fragments of pyrolusite (Fig. 1) or quartz or rock

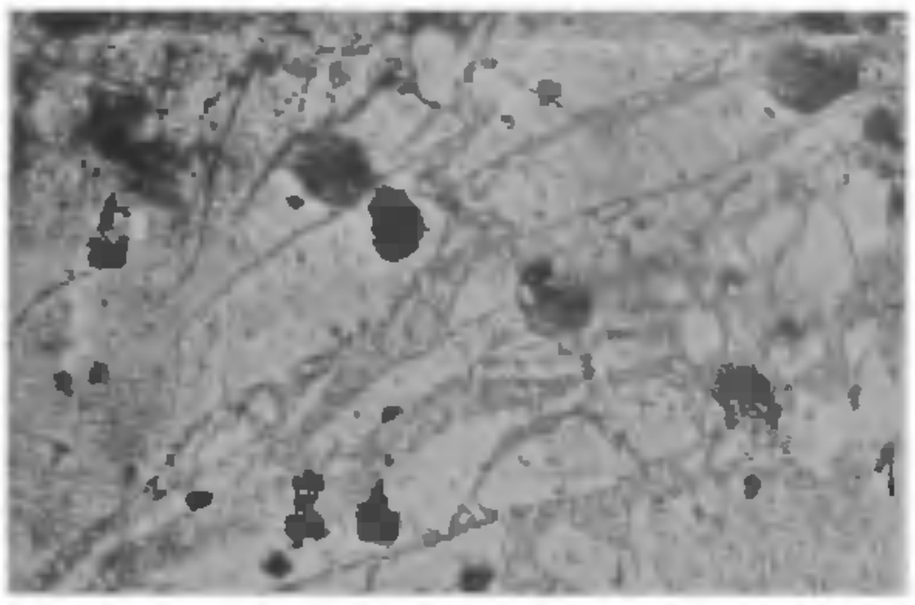

FIG. 1. Pyrolusite is light grey in colour and fractured. The fractures are filled with nsutite (× 30).

gangue. It also occurs forming the outermost layers on colloform psilomelane replacing it along the banding or grain boundaries or even irregularly. Sometimes, veins of nsutite are found to traverse rock fragments, which are enclosed in the base of nsutite. Presence of nsutite in secondary deposits forming outermost layers on colloform bands indicates that it has been formed from colloidal sols.

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CHANGES IN THE ALKALINE PHOSPHATASE ACTIVITY OF OVARIES DURING OVULATION INDUCED BY PITUITARIES IN THE FROG, *RANA CYANOPHLYCTIS* SCHNEIDER

DURING the course of our investigations on the annual variations in certain bio-chemical constituents of ovaries in the frog, *Rana hexadactyla*, a marked increase in the alkaline phosphatase activity was found to correlate with the vitellogenic processes occurring in the oocytes during the breeding season. As the oocytes became gravid the activity decreased significantly. This reduction in the enzyme activity was, also, found to correlate with a similar depletion in the ascorbic acid content of ovaries. It was, therefore, suggested[1] that the changes in the alkaline phosphatase activity of ovaries might be due to the release of gonadotrophins from the pituitary. However, experimental evidence in support of this presumption was inadequate. The ovaries in *R. hexadactyla* would regress soon after the breeding was over towards the end of the south–west monsoon months (June–September). Hence this investigation was undertaken in a related species namely *Rana cyanophlyctis*, which would maintain the gravidity of ovaries round the year[2], as an attempt to study the gonadotrophin action on ovaries at a time when the synthesis and/or release of these hormones were considered to be at their minimum such as the post-breeding season[3].

The breeding season of *R. cyanophlyctis* would commence by June and extend upto the end of September[2]. Adult females weighing 30–38 g were collected from the vicinity of Mysore city (India) during October and maintained separately in aerated aquaria at 25° ± 1° C. They were induced to ovulate with homoplastic pituitaries which were collected from females of similar weight range. The pituitaries were homogenized in distilled water in the proportion of five glands per ml and one ml of this homogenate was administered intra-peritoneally into the treated ones[2]. Frogs receiving an equal volume of distilled water served as the controls. The autopsy was carried out at intervals after the treatment, as shown in Table I. Appropriate amounts of the ovarian tissue were weighed and used for the estimation of the enzyme activity. The procedures employed were those of Kind and Macchi[4] for the extraction and Fiske and Subba Rao as cited by Hawk *et al.*[5] for the estimations. Ovaries from a group of non-gravid females were also included for a comparison. The readings were taken from Klett-Summerson photo-electric colorimeter.