The tooth, an upper molar with characteristic simple and low crown, two linear, antero-posteriorly placed and closely adherent connate roots (Owen[3]), shows that it belongs to a specimen of the Grey Seal. Its occurrence in Mound F indicates that it is chronologically the oldest, among the various exhibits and remains studied so far, from the site and is more than 5000 years old.

The typical habitat of this seal and its restricted distribution within the temperature and arctic seas suggest it to be exotic, but its appearance in the site is inexplici. It is conceivable that one or a few preserved specimens or portions of the skeleton were either imported by traders or that the Harappan people came as immigrants from some coastal areas of Europe or U.S.S.R. and brought with them a few preserved specimens of the seal, for some use in ritual, as a talisman in occult operation. Of course it is also not very unlikely that the people of Harappa used to extract fat from the blubber of such animals to use as a fuel to illuminate their lamps.

Whatever be the reason behind, this finding constitutes the first record of this kind, from the pre-historic sites in India and adjoining countries, unearthed so far.

Zoological Survey of India, Calcutta, *July* 20, 1977.

M. GHOSH.
U. SAHA.

1. Prashad, B., *Mem. Archael Surv. India*, Delhi, 1936, 51.
2. Ellerman, J. R. and Morrison-Scott, T. C. S., *Checklist of Palaearctic and Indian Mammals*, London., 1951.
3. Owen, R., *Odontography.*, Hipply Ailliere, Publisher, London., 1845, Vol. 1.

ACID AND ALKALINE PHOSPHATASE AND AMYLASE CONCENTRATION IN THE SEMEN OF MALABARI BUCKS

VARIATIONS in the enzymic activity in the semen has been reported in different species in past. Increased alkaline and lower acid phosphatase activity has been reported in bull and ram semen by Mann *et al.*[4]. Amylase enzyme has been found in mammalian spermatozoa by Hultin and Lundbald[2] and in the prostatic secretions by Povoa[5]. As there was no literature available on enzymes of goat semen, this study was taken up.

Material and Methods

A group of seven Malabari bucks of 1–4½ years of age maintained at the Goat Farm, Kerala Veterinary College, Trichur, was used for this study. Animals of sound health, good serving capacity and normal sexual behaviour were selected for the study. They were reared under identical conditions and were fed with concentrates and jack leaves as per the normal feeding schedule. The semen samples were collected using artificial vagina from each buck with an average interval of four days in between two collections. The biochemical analysis was carried out immediately after collection.

Acid phosphatase, alkaline phosphatase and amylase activity were assessed by King and Wootton[8] method, and acid and alkaline phosphatase activities were expressed in K.A.U. per 100 ml and amylase activity in Somogyi units per 100 ml.

Results

The observed results have been given in tabular form (Table I).

TABLE I

Showing enzymic concentration in the semen of Malabari bucks

Sl. No.	Alkaline Phosphatase in K.A.U.	Acid Phosphatase in K.A.U.	Amylase in Somogyi units
1.	62·50	0·25	96·00
2.	247·50	3·60	98·30
3.	82·50	Nil	128·00
4.	200·00	Nil	109·90
5.	100·00	Nil	133·33
6.	30·00	Nil	100·00
7.	37·50	Nil	147·20
Mean	107·14	Nil	116·40
S.E.	31·84	Nil	7·58

Discussion

Phosphatase activity varies with feed (Reid *et al.*[6]), and species (Mann *et al.*[4] and Epen *et al.*[1]). There are no values of these enzymes available for comparison in ram and buck semen. The acid phosphatase activity was low and insignificant. The results obtained in the present study confirm the earlier reports that, concentration of alkaline phosphatase is more than that of the acid phosphatase in the semen of domestic animals. The amylase activity of goat semen in the present study was found to vary from 96·00 to 147·20 with a mean of 116·10 ± 7·58 Somogyi units.

The presence of enzymes, namely, acid phosphatase, alkaline phosphatase and amylase in buck semen were studied in the present investigation. Acid phosphatase activity was found to be insignificant. Alkaline phosphatase activity varied from 30·00 to 247·50 K.A.U. with a mean of 107·14 ± 31·84 K.A.U. Marked amylase action was detected with a mean unitage of 116·10 ± 7·58 Somogyi units.

May 4, 1977.

R. V. PATIL*.
C. K. S. V. RAJA**.

* Associate Professor, Department of Gynaecology and Obstetrics, Veterinary College, University of Agricultural Sciences, Bangalore 560 024.
** Professor of Gynaecology and Obstetrics, Kerala Veterinary College, Trichur.

1. Eapen, K. J., Srivastava, P. N. and Razanasir, M. N., *Abst. ABA.*, 1963, **32**, 2946.
2. Hultin, E., and Lundblad, G., *Exp. Cell. Res.*, 1952, 3, 427.
3. King, E. J., and Wooton, I. D. P., *Microanalysis in Medical Biochemistry*, 1959.
4. Mann, T., Lutwak, K., and Mann. C., 1951, Cited by Mann, T., 1964.
5. Povoa, H., 1963. Cited by Mann, T., 1964.
6. Reid, J. T., Ward, G. M. and Salisbury, R. L., *Abst. A.B.A.*, 1948, 16, 1397.

OBSERVATIONS ON OVARIAN ASCORBIC ACID AND CHOLESTEROL DURING INDUCED OVULATION IN THE SKIPPER FROG *RANA CYANOPHLYCTIS* SCHNEIDER

THE physiological basis of ovulation in Amphibis is complicated due to the fact that the release of gravid eggs from ovaries results from an integrated functioning of the different endocrine organs, such as adrenals[1] and thyroids[2] in addition to the pituitary[3]. However, the pituitary homogenates induce ovulation better than steroids while the latter are more efficient inducers of the oocyte maturation[4]. It may be pointed out that in all these studies the response of ovaries to ovulation induced by a variety of agents has been evaluated on a common morphoogical basis, *ie.*, by counting the number and rate of eggs released *in vivo* or *in vitro*. It is therefore essential to have information on the alterations occurring in ovary, particularly at biochemical levels, during ovulation induced by different agents at any given time and at different periods of the annual cycle and hence this investigation was undertaken.

Adult female frogs, *R. cyanaphlyctis*, weighing 30–45 g were collected during the months of June and October[5]. Ovulation was induced by administering pituitary and hormones intraperitioneally. The hormones and the doses employed[6] were methyl testosterone, progesterone and DOCA (Sigma Chemicals and Co.). They were dissolved in olive oil (0·2 ml oil contained the dose, Table I). Eltroxine tablets (Glaxo) 0·1 mg were powdered and suspended in distilled water. One ml of this was administered in combination with a single pituitary. All frogs were maintained individually in aerated aquaria under laboratory conditions (26 ± 1° C). Frogs from the breeding period (Table I) were autopsied exactly at the 8th hour after the treatment[7-8] while those

TABLE I

Response of ovary to ovulation induced by pituitaries and hormones

	Treatment		per 100 mg weight of ovary (M ± S.E.)		Response*
			Ascorbic acid (μg)	cholesterol	
1	Control dist. H_2O 1 ml	(5)	20·62±0·5	1·93±0·14	–
2	Control olive oil	(5)	19·72±1·11	1·72±0·03	–
3	Treated 1 pituitary	(5)	22·83±1·10	1·61±0·09	–
4	Treated 2 pituitaries	(5)	22·96±1·51	1·35±0·04	++
5	Treated 4 pituitaries	(5)	22·43±1·32	1·35±0·01	+++
6	Treated 1 mg progesterone	(5)	26·15±4·13	1·81±0·26	+++
7	Treated 1 mg DOCA	(5)	19·88±0·86	1·37±0·08	+++
8	Treated 2 mg methyl testosterone	(5)	21·50±5·29	2·04±0·02	+
9	Treated 0·1 mg eletroxine + 1 pituitary	(5)	24·16±3·27	1·76±0·30	++

* Response + = 1 to 10 eggs released
++ = 10 to 50 eggs released
+++ = 50 or more eggs released
Number in parenthesis is the number used.
M ± S.E. = mean in relation to standard error.

Cholesterol	
1 *vs.* 3 *t* = 2·14	$P < 0·05$
1 *vs.* 4 *t* = 3·40	$P > 0·001$
1 *vs.* 5 *t* = 3·44	$P > 0·001$
1 *vs.* 7 *t* = 3·54	$P < 0·001$