

## SHORT COMMUNICATION

### PLASMA MONOAMINE OXIDASE LEVELS IN MAMMALS

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**Summary:** Plasma monoamine oxidase (MAO) levels in ruminants and non-ruminants including man are reported. The mean MAO levels in units are, goat  $6699.7 \pm 367.4$ ; cattle  $6272.9 \pm 9.257.4$ ; camel  $5166.0 \pm 666.8$ ; sheep  $4831.4 \pm 543.8$ ; buffalo  $4045.8 \pm 387.3$ ; rabbit  $837.0 \pm 19.3$ ; dog  $441.8 \pm 55.5$  and man  $20.0 \pm 2.8$  respectively.

**Key words:** plasma monoamine oxidase animals man

### INTRODUCTION

The intramitochondrial role of monoamine oxidase (MAO) in metabolic degradation of catecholamines and serotonin in sympathetic nerve ending (1,2,3) adrenal medulla and various brain regions (3,11) is well established. Presence of this enzyme has also been detected in the serum of a few domestic animals including man (2,3,4,5,7,8,9). Serum MAO is said to be different from mitochondrial MAO as it does not metabolise catecholamines and serotonin (5).

Recently type A and type B forms of MAO have been identified due to their substrate specificity (10,12). For human serum MAO, specific substrate is shown to be benzylamine.

The present study was designed to quantitate the levels of MAO in plasma of various species of ruminants and non-ruminants including man, using benzyalamine as substrate.

### MATERIALS AND METHODS

125 mammals of either sex (30 cattle, 10 buffaloes, 45 camels, 10 sheep, 10 goats, 5 dogs, 5 rabbits and 10 human beings) were screened for MAO levels.

Heparinised blood samples were collected and analysed within 3 hours of collection. Few samples were also kept at room temperature for 24-48 hours before being analysed to study the deterioration rate. MAO levels did not decrease upto 48 hours when kept at room temperature. Estimation of MAO was done by the technique of McEwen and Cohen (5) using benzyalamine as the substrate in phosphate buffer 0.01 M pH 7.2 using Beckman DU-Spectrophotometer.

Assay tubes containing benzyalamine substrate were incubated for one hour instead of 3 hours because of very high activity of this enzyme in ruminants. Results however, were computed as suggested by McEwen and Cohen (5) after applying necessary corrections.

## RESULTS AND DISCUSSION

The mean MAO units obtained in group I, which comprised of ruminants are 10-12 folds higher than non-ruminants in group II except human being where the activity is almost 300 fold less and the values are presented in Tables I and II.

TABLE I: Plasma MAO levels in ruminants.

No.	Ruminants	Mean values in units
1.	Goat	6699.7±367.4
2.	Cattle	6272.9±257.4
3.	Camel	5166.0±666.8
4.	Sheep	4831.4±543.8
5.	Buffaloe	4045.8±387.3

TABLE II: Plasma MAO levels in non-ruminants.

No.	Non-ruminants	Mean values in units
1.	Rabbit	837.0±19.3
2.	Dog	441.8±55.5
3.	Man	20.0± 2.8

One clinical unit = 0.01 OD at 242 m $\mu$ /3 hours at (37°C). For each assay suitable blanks were run concurrently and the suitable blank deductions were made.

The mean values of MAO in human-being found in the present study corresponds with the earlier reports (3,5,7). There is no appreciable loss of activity on storage for 24 hours at room temperature and similar observations were recorded earlier (3).

The significance of high MAO levels in large animals especially ruminants is not yet clear. However, recent reports of Robinson *et al.* (8) and Robinson (9) made a definite positive correlation of levels of this enzyme with age of individual and patients suffering from depressive disorders. Elevated levels of this enzyme has also been reported by Nilssons *et al.* (7) in diseases like diabetes mellitus, thyrotoxicosis and congestive heart-failure.

Probably very high levels of MAO in the blood of ruminants may be related to deaminating processes and also maintaining the voluminous gastro-intestinal motility.

Further planned study is needed in ruminants to answer its role.

## ACKNOWLEDGEMENTS

The authors are grateful to the Dean, Dr. Mohan Singh, College of Veterinary and Animal Science, Bikaner for providing the facilities.

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