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MONOAMINE OXIDASE ACTIVITY IN THE PROSTATE GLAND OF *TAPHOZOUS LONGIMANUS* HARDWICKE (MICROCHIROPTERA : MAMMALIA)

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ABSTRACT

The paper describes the histochemical distribution of monoamine oxidase (MAO : E.C. : 1.4.3.4.) in the prostate gland of sexually mature *Taphozous longimanus*. Very intense activity was discerned in the acini epithelial cells and secretion; stromal cells and luminal fluid exhibited moderate to weak activity. It is suggested that MAO may have a protective role in circumventing the induction of deleterious effects of biogenic amines on the spermatozoa.

INTRODUCTION

A VARIETY of metabolic enzymes have been histochemically and biochemically demonstrated in the prostate gland of many mammalian species under normal and pathological states¹⁻⁴. It has been shown that 30% of human seminal plasma constituents originate from prostate gland⁴. These secretions are believed to meet the requirements of spermatozoa to ensure their motility and viability.

Swami and Lall⁵ were the first to report the histochemical distribution and possible role of acid phosphatases and adenosine triphosphatase in the prostate gland of sexually mature *Taphozous longimanus*.

Monoamine oxidase (MAO : E.C. 1.4.3.4) converts several biogenic amines into their acid derivatives and has been related to androgen synthesis and testicular development⁶. The occurrence of this enzyme activity has not been histochemically demonstrated in the prostate gland of mammals. The present report deals with the histochemical site and distribution of MAO in the prostate gland of sexually mature *T. longimanus*.

MATERIAL AND METHODS

Sexually mature males of *T. longimanus* (weight 23.0-25.5 gm) used in the present study were locally collected. They were maintained in batches of 2-3 in steel cages with wire nettings and had *ad libitum* access to sugared water. A total of 7 males were used. The animals were sacrificed by cervical dis-

location. Prostate glands were quickly dissected out, freed from blood and connective tissues and washed in chilled mammalian ringer (at 4° C).

Fresh frozen sections were cut at 10 μM. MAO activity was demonstrated histochemically according to Gleener *et al* method⁷ using tryptamine hydrochloride (Fluka) as substrate. The sections were incubated for 15 min at 37° C. Presence of blue formazon deposits indicated sites of MAO activity. Sections incubated in a substrate free medium served as controls.

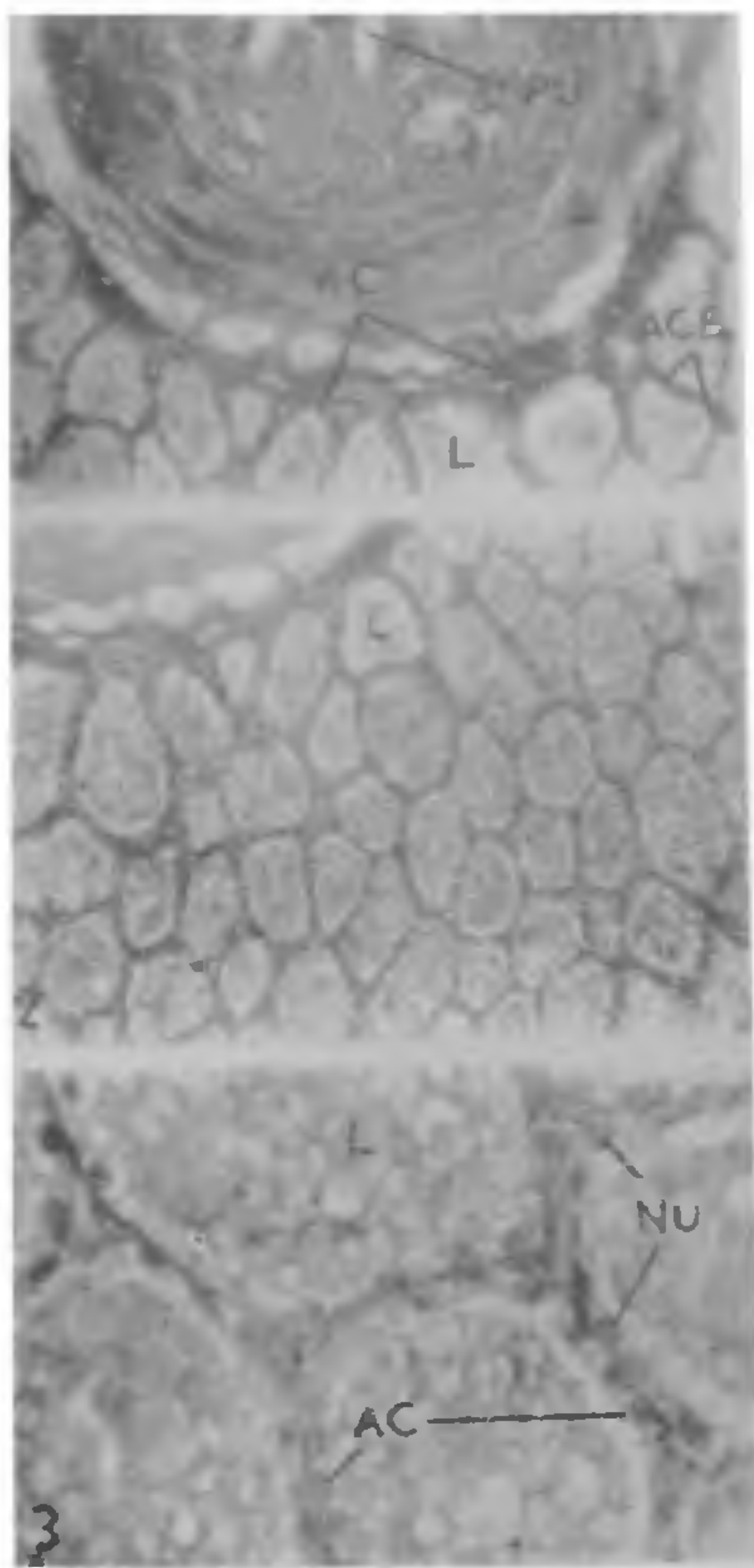
Enzyme activity was visually appraised and scored as described earlier⁵.

RESULTS

Positive MAO activity was seen in the cytoplasm of the epithelial cells. Secretion granules inside the cells and in the lumen; and stroma exhibited very intense enzyme reaction. Nuclei indicated intense MAO activity. Luminal fluid showed mild enzyme reaction (Figs. 1-3).

DISCUSSION

The present study is the first to demonstrate histochemically the distribution of MAO in the prostate gland of a chiropteran species—*T. longimanus*. The presence of MAO in the acinal epithelium and the luminal fluid of the prostate gland suggests that synthesis and elaboration of this enzyme takes place in this organ. The presence of MAO endows to the prostate the ability to degrade biogenic amines that might otherwise detrimentally affect the spermatozoa.



FIGS. 1-3. Monoamine oxidase activity in the prostate gland of *Taphozous longimanus* Hardwicke. Fig. 1. T.S. of prostate showing differential MAO

activity in the acini epithelium, stroma, luminal fluid and prostatic urethrae, (100 ×). Fig. 2. A portion of the prostate acini enlarged to show varying intensities of di-formazon granule deposition (100 ×). Fig. 3. Prostatic acini at higher magnification to show enzyme distribution in the cytoplasm, nucleus, stromal strands, and acini lumen (400 ×). PU—Prostatic urethrae; Ac—Acini; ACE—Acini epithelium; L—Lumen; NU—Nucleus.

Prostate gland dysfunctions may profoundly affect fertility of man^a. Detection of 'marker enzymes' for assessing prostatic functions may be thus of considerable significance. To us, MAO appears to be a suitable 'candidate enzyme' for assessing prostatic functions and dysfunctions.

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