

ANALYSIS OF BIOCHEMICAL COMPONENTS OF WALL LIZARD'S EPIDIDYMIS : EFFECT OF ENERGY SUBSTRATES ON SPERM MOTILITY

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(Received 4 July 2022, Revised 31 August 2021, Accepted 12 September 2021)

ABSTRACT : The functional significance of anterior, middle and posterior segments of wall lizard's epididymis, which were found histologically comparable to caput, corpus and cauda of mammals though morphologically not differentiated as in mammals, is studied in the present investigation. Further, the effects of energy substrates on motility of spermatozoa are also studied. The testicular or epididymal fluid from any segments did not contain glucose or fructose while GPC, Sialic acid, Lactic and pyruvic acid was found to be secreted by both testis and all segments of epididymis in lizards of breeding phase. The level of GPC and pyruvic acid decreased remarkably ($P < 0.01$) from anterior to posterior regions whereas sialic acid increased from anterior to posterior part. However, lactic acid exhibited little variation in its level throughout the epididymis. In response to testosterone treatment in castrated lizards, except pyruvic acid, the marked presence of GPC, sialic acid and lactic acid was noted in the epididymal fluid of all the segments. Among the energy substrates, only Na-pyruvate could initiate/stimulate the motility of non-motile testicular spermatozoa as well as highly motile epididymal spermatozoa. IBMX and di cAMP elevated the % motility of only epididymal spermatozoa in a dose-dependent manner.

Key words : Epididymis, energy substrates, sperm motility.

How to cite : B. K. Nirmal and U. Rai (2022) Analysis of biochemical components of Wall lizard's epididymis : Effect of energy substrates on sperm motility. *J. Exp. Zool. India* **25**, 2199-2203. DocID: <https://connectjournals.com/03895.2022.25.2199>

INTRODUCTION

Barring few reports, which question the importance of epididymis in sperm maturation in human (Silber, 1988), the changes in luminal contents of different segments of epididymis and their influence in development of forward progressive motility of spermatozoa, which is sign of maturation, has been convincingly demonstrated in mammals. The epididymis of reptiles is not morphologically differentiated like caput, corpus and cauda of mammals. But histologically, the anterior, middle and posterior segments have been reported comparable to caput, corpus and cauda of mammals, respectively in *Hemidactylus flaviviridis* (Haider and Rai, 1987) and *Lacerta vivipara* (Depeiges and Dacheux, 1985). Further, like mammals, the immotile testicular spermatozoa of reptiles develop potential for active movement in epididymis. The increase in percent motility, change in motility pattern, i.e., from circular, zig-zag to wavy or curvilinear and increase in the potency of epididymal fluid, from anterior to posterior segments in initiating the motility of non-motile testicular spermatozoa have been reported

in lizards *H. flaviviridis* (Nirmal and Rai, 1997) and *L. vivipara* (Depeiges and Dacheux, 1985). However, the nature of luminal contents of the epididymis pertaining to motility of spermatozoa and changes in their level from testis to epididymis has not been studied in reptiles. Hence, the present study was designed to investigate the composition of epididymal luminal milieu in different segments of epididymis and also their androgenic control in *H. flaviviridis*. Additionally, the influence of energy substrates on motility of spermatozoa was also carried out.

MATERIALS AND METHODS

Glucose, fructose, glycerylphosphorylcholine (GPC), sialic acid, pyruvic and lactic acids were estimated in the fluids of testis and anterior, middle and posterior segments of epididymis of wall lizards during breeding phase. (February-March). To observe the influence of androgen on the secretion of aforesaid biochemical constituents from the epididymis, the same were estimated in different segments of epididymis in castrated-testosterone treated lizards during non-breeding phase (July-August).

wall lizard is either regulated by some other androgen than testosterone or presence of spermatozoa in the epididymis may be required for that secretion in response to the androgen.

ACKNOWLEDGEMENT

The authors are thankful to the University Grants Commission, New Delhi, India for the financial support.

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