



## Anatomy of Male Reproductive System of leaf-nosed Bat, *Hipposideros speoris* (Schneider): Chiroptera

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### Abstract:

The male reproductive system of *Hipposideros speoris* fixed in 10% Formalin and used for anatomical study. The testes are ellipsoidal, post-abdominal and enclosed in a thick muscular sac (pubic capsule). The pubic capsule is large thick blackish pink in appearance and loose with external wrinkles. The epididymis closely abuts the testes on its dorsomedial aspect and is recognized into distinct caput, corpus and cauda epididymis. The male accessory reproductive organs comprise of a paired ampullae of Henle, a prostate, paired Cowper's glands and urethral glands. The penis increases in thickness with the tip directed cranially. The present study is based on the anatomical study of male reproductive system of *Hipposideros speoris* collected from Chandrapur, Maharashtra, India.

### Keywords: -

Accessory glands, Anatomy, Bat, Epididymis, *Hipposideros speoris*, Reproduction, Testis.

### Introduction:

The Order-Chiroptera comprises of two Suborders-Megachiroptera and Microchiroptera; Family-Rhinolophidae comprises two subfamilies-Rhinolophinae and Hipposiderinae. Racey (1975) in his review on the prolonged survival of spermatozoa in bats observed that reproductive tracts of several species of vespertilionid and rhinolophid bats store sperms in the uterus or oviducts of females and in the cauda epididymides and ductus deferens of males.

In Chiroptera, five types of tubules have been described in the caput epididymis of two vespertilionid bats, *Pipistrellus mimusmimus* and *Pipistrellus ceylonicus chrysothrix* and one type of tubule in corpus and cauda epididymis (Gopalakrishna et al., 1974). In the Indian fruit bat, *Rousettus leschenaulti*, seven (Sapkal and Sahasrabudhe, 1986) types of tubules in caput; one type in corpus and two types in cauda epididymis have been described. The tubules of epididymis show variation in the diameter, height of the epithelium, cell types and number of spermatozoa (Sapkal and Sahasrabudhe, 1986).

Krishna and Dominic (1984) studying the reproductive cycle in the male fruit bat, *Cynopterus sphinx* and reported active spermatogenesis in October - November and mid-January- April. In *Rhinolophu scapensis*, spermatogenesis occurred between October and May (spring to autumn) and the sperm being released to the cauda epididymis in April and May (Bernard 1985). While male bat, *Rhinopoma hardwickei hardwickei* showed annual reproductive cycle and the testes were permanently abdominal (Banerjee and Karim 1986). Singh (1997) described the seasonal chronological events of the reproductive cycle and changes in structure and function of accessory sex organs of *Taphozous longimanus* at Varanasi.

### Material and methods:

The preserved specimens are used for the present work. This report is based on the study of *Hipposideros speoris* male bats which were collected from underground dark places nearby Chandrapur, India, throughout the year. The collections were made once a month during the breeding activity of the male. The male reproductive systems of bats are photographed and display the anatomy of the testes, epididymis and accessory reproductive organs.

### Observations and discussion:

The testis is ellipsoidal in shape and post-abdominal in position. The testes are enclosed in a thick muscular sac - the pubic capsule. The pubic capsule is large thick blackish pink in appearance and loose with external wrinkles. The reproductive patterns and breeding habits in emballonurid bats, *Taphozous melanopogon* (Sapkal and Khambare, 1983), *Taphozous kachhensis* (Sapkal and Deshmukh, 1985) and *Taphozous georgianus* (Kitchener, 1973; Jolly, 1990) reported a sharply restricted annual sexual cycle.

The epididymis closely abuts the testis on its dorsomedial aspect and is recognized into distinct caput and cauda regions and a thin inconspicuous corpus epididymis. The ductus deferens which emerges from the cauda epididymis is short in length and it enters the abdominal cavity along with the components of the spermatic cord. Grossly, the epididymis in most of the species of mammals can be divided into three regions- head, body and tail (Bishop, 1961); although further subdivisions have been described in virtually all species (Reid and Cleland, 1957; Glover and Nicander, 1971; Hamilton, 1975). The epididymis of bat, *Vesperugo savi* and *Vesperugo piccolo* is divided into three regions: head, body and tail (Azzali et al., 1983).

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In the abdominal cavity, the ductus deferens leaves the other components of the spermatic cord (internal spermatic nerve, spermatic artery and spermatic vein), passes mesially and loops dorsal to the ureter and joins the ampullae of Henle of the respective side. The male accessory reproductive organs comprise of a paired ampullae of Henle, a prostate, paired Cowper's glands and urethral glands. Similar observations was reported by Barone (2001) where the bulbourethral glands form a paired organ, localized on the dorsal surface of the pelvic urethra, in the region of the pelvic arch and penile root. Their consistence was denser than that of the prostate gland, their surface is irregular and structure lobular. These glands were located in the connective tissue of the urogenital part of the perineum. The bulbourethral glands of the rabbit were a compact structure, surrounded by a fibrous capsule and bulboglandularis. The glands are cubic in shape and extend along the dorsal urethral wall. Rabbit bulbourethral glands are connected to the prostate gland by connective tissue (Vasquez and Del Sol, 2001).

The rat prostate is a large gland, which surrounds the urethra and is composed of several distinct lobes: the ventral, lateral, dorsal, and anterior lobes (Coagulating gland) (Coffey, 1974). The accessory reproductive organs are all distinctly cyclic varying in gross size, weight, histology and secretory activity (Pal, 1977; Bhatia, 1980). The penis is long and thick with the tip directed cranially. The accessory reproductive glands were investigated anatomically in the an adult squirrel, wild mice, and the Mongolian gerbil (Pinheiro et al., 2003; Cakir and Karatas, 2004; Mollineau et al., 2006).

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