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STUDY ON THE MORPHOLOGY OF FEMALE GENITAL TRACT OF BATS ROUSETTUS LESCHENAULTI, MEGADERMA LYRA LYRA AND HIPPOSIDEROS SPEORIS

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Abstract

The variations in female reproductive tract among the most of the orders of bats are found in India and in all over the world. The variations in respect with the development and structure of Ovaries, fallopian tube, the development of external and internal features of uterus, fusion of uterine cornua, expansion of the common uterine body, elaboration of cervical region. The present study showing the comparison of female reproductive tract among the three species of bats Rousettus leschenaulti, Megaderma lyra lyra and Hipposideros speoris. The differences are found in uterine horn, uterine body cervical region and vagina in respect with length and thickness. No differences found in ovaries and fallopian tubes in all the three species of bats. This study providing a phylogenetic framework to evaluate critically structural and functional data sets in the evolution of bat families.

Introduction

Investigations on the various aspects of reproduction of several species of Indian bats belongings to diverse families and exhibiting different types of breeding behavior have been reviewed by (Gopalakrishna and Sapkal,1986). Bats represent about 20% of all classified mammals species worldwide, with about 1116 bat species divided into two suborders the less specialized and largely fruit eating megachiroptera, flying foxes and the more history specialized and ecolocating microchiroptera. About 70% of bats are insectivores, rest are frugivores i.e. fruit eater and very few species are the vampire bats. (Simmons, 2005).

Many workers have reviewed the reproductive behaviour of chiroptera and observed that bat have no uniformity in reproductive behaviour. Even they closely allied species exhibits different breeding habits. (Gopalakrishna, 1955), (Ramakrishna,1961), (Oxberry and Jerret,1979) reviewed the anatomical and functional asymmetries of the female reproductive organs in bat. (Thakur, 1972) studied the reproductive tract of Pipistrellus mimus mimus and observed the ovaries are more or less ellipsoidal in shape enclosed in ovarian capsule. The fallopian tube bends along the lateral border of capsule and opens to uterine cornua. The two cornua giving 'Y' shape appearance with the vagina. The vagina forming the median limb of the 'Y' . A common cervical canal opens in to the vagina.

Materials and Methods

Female specimens of *Rousettus leschenaulti*, Magaderma lyra lyra and Hipposideros speoris used for the present study were obtained from Ballarshah, Chandrapur and Kandri mines, near Nagpur, India. The bat were collected from underground delapidated dark rooms and mines. The bats were collected with the help of a butterfly net. The Animals were brought alive to the laboratory with minimum stress. Wet gunny bags rapped to the plastic cage were used to provide lowered temperature and set darkness. Their body weight were taken with the help of a spring balance Immediately after anaesthetized them with chloroform and fixed in alcoholic Bouin's fixative, 10% formalin and Neutral formalin for 24 hours. The female reproductive system was dissected out.

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Observations

Morphology of the Female Reproductive System of *Rousettus leschenaulti*

The uterus is bicarnuate and the two uterine cornua are morphologically symmetrical. The uterine horns are 6 to 8 mm long and 1 mm thick. The ovaries are slightly dorsoventrally flattened and ellipsoidal in shape. The ovary is enclosed in a complete ovarian bursa, which has, on its postero-mesial side, a small opening by which the cavity of the bursa is in communication with the peritoneal cavity. The fimbricated funnel of the fallopian is situated near the opening of the ovarian bursa.

Although the two cornu meet externally, their lumen remain separate throughout the length, and open into the vagina through independent cervical canals. The cervix protrudes as a hemispherical bulb into the cranial part of the vaginal lumen. The cranial half of the vagina is slightly bulged because of the presence of the bulbous cervix. The vagina is about 10 mm long and opens by a transverse slit like opening. (Fig - 1).

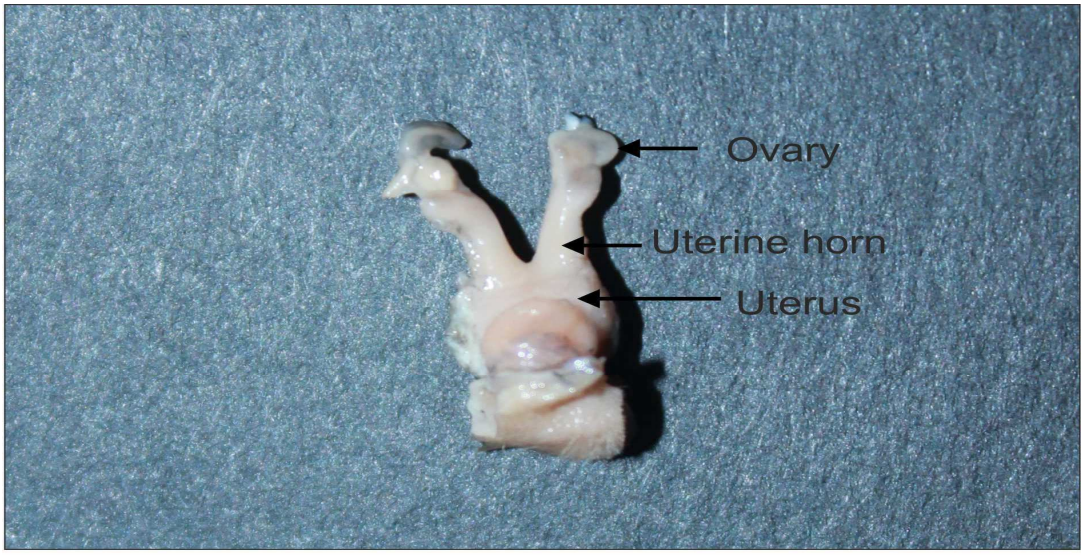

Figure-1 The reproductive tract of Rousettus leschenaulti showing Ovary, Uterine horn and Uterus. The uterus is bicarnuate and the two uterine cornua are morphologically symmetrical. The ovaries are slightly dorsoventrally flattened and ellipsoidal in shape (x100).

Morphology of the Female Reproductive System of *Megaderma lyra lyra*

The ovaries are ellipsoidal in shape and its completely enclosed in an ovarian capsule. The fallopian tube arises from the median side of the ovarian capsule takes a circuitous course around the dorsal part of capsule, bends caudally and open into the respective uterine cornu. The uterus is bicarnuate and the two cornua are morphologically symmetrical and meet posteriorly at an acute angle forming a 'Y' shaped structure. The uterine horns are 4 to 6 mm long and 1 mm thick. Both uterine canals open into a single cervical canal i.e. cervix, which in turn opens into the long tube, the vagina which open to outside by the small slit like transverse opening the urinogenital aperture. The vagina is about 10 mm long (Fig - 2).

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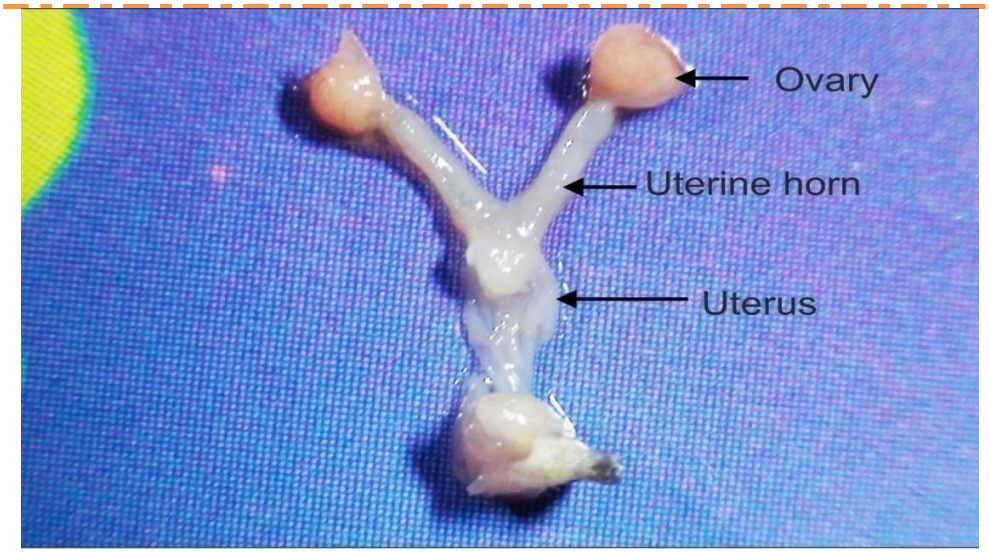

Figure-2 The reproductive tract of Megaderma lyra lyra showing Ovary, Uterine horn and Uterus(x100). The ovaries are elipsoidal in shape and its completely enclosed in an ovarian capsule. The uterus is bicarnuate and the two cornua are morphologically symmetrical and meet posteriorly at an acute angle forming a 'Y' shaped structure

Morphology of the Female Reproductive System of *Hipposideros speoris*

The ovary *of Hipposideros speoris* is more and less ellipsoidal in shape. The ovary is enclosed in a distinct ovarian capsule which has a slit like opening on its ventral surfaces by which the periovarial space is in communication with the peritonial cavity. The two cornua meet caudally of an acute angle giving the genitalia a 'Y' shaped appearance, with the vagina forming the median limb of the 'Y'. The uterine horns are 4 to 4.5 mm long and 0.75 mm thick. A common cervical canal opens into the vagina. The vagina is about 7 mm long, It opens to the exterior by a broad transverse vulval opening (Fig – 3).

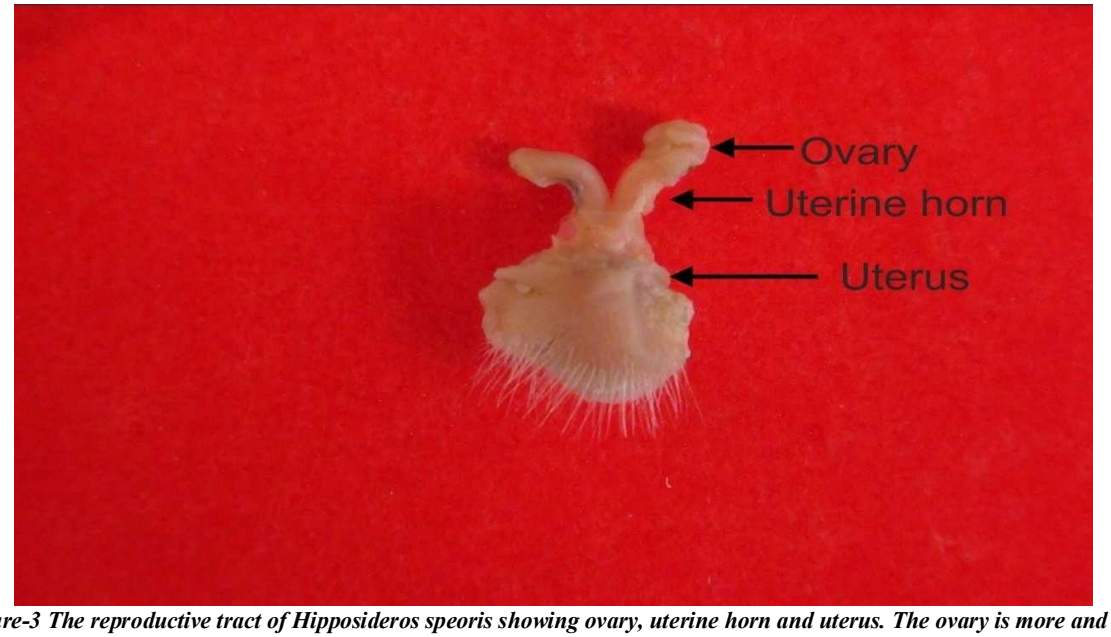

Figure-3 The reproductive tract of Hipposideros speoris showing ovary, uterine horn and uterus. The ovary is more and less ellipsoidal in shape (x100).

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Discussion

(Gopalkrishana and Choudhari,1975) and (Karim,1975) described the morphology of the female reprodutive organ in Rousettus leschenaulti in which the uterus is bicornuate. the ovaries are ellipsoidal in shape, slightly flattened dorsoventrally. The fallopian tube on each side arises on the medial aspect of the ovarian bursa curves towards the lateral sides and opens near the cranial end of the uterus. Although the two uterine cornua meet externally their lumina remain separate and open into the vagina through independent cervical canals. The cranial half of the vaginal canal is broad, and the cervix protrudes as a hemispherical bulb into this cavity. The lumen of the vagina is narrow in the caudal half. (Thakur, 1972) have studied the morphology of female genital tract of Pipistrellus mimus mimus and described that, the ovaries are ellipsoidal in shape enclosed in ovarian capsule. The fallopian tube arises from antero-median side of ovarian capsule, by taking sharp double bend open in to uterine cornu. The two cornua meet caudally giving the genitalia a Y shape. The common cervical canal open in to vagina. (Hood, 1989)found the variations in the female reproductive tract of Pteropodidae family of Bats. The variations are found in the development of fallopian tube and uterus, fusion of uterine cornua, expansion and elaboration of uterine body and cervical region. (Orbach et.al, 2016) Studied the female reproductive tract of Bottlenose Dolphin *Tursiops truncates* and described the oval shape of ovary, the small dimeter of uterine horn with internal longitudinal bands in immature female. In Mature,uterine horns were greater in diameter and not banded internally. Distal end of cervix uneven and serrated. (Santos et.al, 2014) studied the morphology of female genitalia of Rodent Galea spixii (Caviidae, Caviinae) and described the shape of ovaries, thickness of uterus and uterine horns, the morphological development of cervix and vagina.

In the present study, it was found that, In *Rousettus leschenaulti* the ovaries are ellipsoidal, the fallopian tubes are coiled, the uterus is bicarnuate and the two uterine cornua are morphologically symmetrical. The uterine horns are 6 to 8 mm long and 1 mm thick. The uterine body and cervical region broad. The vagina is about 10 mm long and opens by a transverse slit like opening. In *Megaderma lyra lyra*the ovaries are ellipsoidal, The fallopian tubes are less coiled and opened in uterine cornua The bicarnuate uterus and the two cornua are morphologically symmetrical and meet forming a 'Y' shaped structure. The uterine horns are 4 to 6 mm long and 1 mm thick. The uterine body and cervical region narrow. The vagina is about 10 mm long. In *Hipposiderosspeoris* ovary is more and less ellipsoidal in shape, fallopian tubes are less coiled. The uterine horns are 4 to 4.5 mm long and 0.75 mm thick. The two cornua meet caudally giving the genitalia a 'Y' shaped appearance. The vagina is about 7 mm long.

Conclusion

The present study showing the comparison of female reproductive tract among the three species of bats Rousettusleschenaulti, Megaderma lyra lyra and Hipposiderosspeoris. In all the three species of bats ovaries are ellipsoidal, the fallopian tubes are coiled, the uterus is bicarnuate and the two uterine cornua are morphologically symmetrical but difference in the thickness and length of uterine horn, uterine body cervical region and vagina. In Rousettus leschenaulti the uterine horns are 6 to 8 mm long and 1 mm thick. The uterine body and cervical region broad. The vagina is about 10 mm long and opens by a transverse slit like opening. In *Megaderma lyra lyra*the two cornua are morphologically symmetrical and meet forming a 'Y' shaped structure. The uterine horns are 4 to 6 mm long and 1 mm thick. The uterine body and cervical region narrow. The vagina is about 10 mm long. In *Hipposiderosspeoris*. The two cornua meet caudally giving the genitalia a 'Y' shaped appearance. The uterine horns are 4 to 4.5 mm long and 0.75 mm thick. The vagina is about 7 mm long. The differences are found in uterine horn, uterine body cervical region and vagina in respect with length and thickness. No differences found in ovaries and fallopian tubes in all the three species of bats. This study providing a phylogenetic framework to evaluate critically structural and functional data sets in the evolution of bat families.

References

1. Gopalakrishana A and Chaudhari P.N, Breeding habits and associated phenomena in some Indian Bats. J. Bombay Natural History society, vol. 74, no.1, 1975.
2. Gopalakrishna A and Sapkal B.M, Breeding biology of some Indian bats- A review J. Bombay nat. Hist. Soc. 83 : 78-101, 1986.
3. Hood C.S, Comparative Morphology and Evolution of the Female Reproductive Tract in Mecroglossine Bats (Mammalia, Chiroptera) Journal of Morphology, vol.199 (2) :207-221, 1989.

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4. Karim K.B, Utero-vaginal junction in the Indian fruit bat, Rousettus leschenauiti (Desmaret). Curr. Sci. 44:706-707, 1975.
5. Orbach D.N, Marshall C.D, Wursig B, Mesnick S.L, Variation in Female reproductive Tract Morphology of the Common Bottlenose Dolphin (Tursiops truncates), Reproductive Biology, https://doi.org/10.1002/ar.23318, 20 January 2016.
6. Oxberry B.A and Jerret D.P, Female reproductive patterns in hibernating bats. S. Reprod. Fert. 56: 359-36, 1979.
7. Ramakrishna P.A, Studies on reproduction in bats. Some aspects of reproduction in the oriental vampires, Lyrodema lyra lyra (Geoffroy) and Megadermaspeoris. J. Mys. Univ., 12: 107-118, 1961.
8. Santos A.C, Bertassoli B.M, Viana D.C, Vasconcelos B.G, Oliveira M.F, Miglino M.A, Assisneto A.C The morphology of female genitalia in Galea spixii (Caviidae,Caviinae), Bioscience Journal 30(6): 1793-1802, November 2014.
9. Simmons N.B, Order Chiroptera. In Wilson, DE and Reeder, DM (eds.) Mammal Species of the World, Third Edition. The Johns Hopkins University Press, Baltimore,: 312-529, 2005.
10. Thakur R.S, Reproduction in the Indian Vespertilionid Bat, Pipistrellusmimusmimus. Ph.D. Thesis, RashtrasantTukdoji Maharaj Nagpur University Nagpur University, Nagpur, 1972..