MORPHOLOGY ON THE NASAL MEATUSES OF MITHUN
(BOS FRONTALIS) IN COMPARISON WITH
THAT OF ZEBU (BOS INDICUS)

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ABSTRACT

The gross structural peculiarities of nasal meatuses were studied in mithun and zebu. The dorsal
nasal meatus was found to be narrow and longest in mithun, while it was reduced in length in zebu. The
middle nasal meatus was smallest and bifurcated at the level of the 1st cheek tooth and communicated
with the frontal sinuses. The ventral meatus was narrow and longest, which communicated with the
frontal and sphenoidal sinuses in both the species. The common nasal meatus was longer and roomy
ventrally in mithun, while it was relatively more elongated in zebu.

INTRODUCTION

Various authors have observed the
gross-morphological observations in domestic
animals (Sisson and Grossman, 1953;
Raghavan, 1964 and Hare, 1975) in buffalo
(Dhingra and Kumar, 1978) and in small
ruminants (Nickel et al., 1979 and Gupta
et al., 1992). However, literatures on
morphological studies of the various nasal
meatuses in mithuns are still meagre.
Therefore, an attempt has been made to
elucidate the same.

MATERIAL AND METHODS

Six (6) number apparently healthy
adult animals (three number of each family) had
been procured. The mithuns were collected
from Arunachal Pradesh, while zebu were
collected locally. The animals were
exsanguinated and fixed in 10% formalin (Luna,
1968). The heads were dissected out
longitudinally to observe the gross anatomical
structures of nasal meatuses. The height and
width of the nasal meatuses had been recorded
at the level of the 3rd and 1st cheek tooth. The
biometrical measurement of the meatuses were
carried out by the Centimeter Scale (Nickel
et al.; 1979) and Vernier Calliper 500-351,
Japan.

RESULTS AND DISCUSSION

The dorsal nasal meatus was narrow
and longer in mithun (Fig. 1) and extended from
the cribriform plate to the vestibular part of
the anterior nasal cavity. Thereafter, it
confluenced immediately with the common
nasal meatus. A similar observation was also
made by Dhingra and Kumar (1978) in buffalo
and Gupta et al. (1992) in goat. The dorsal
nasal meatus of zebu (Fig. 2) extended from
the level of the root of the nasal cavity and the
dorsal concha of the cribriform plate to the
dorsal commissure of the nostril and it
confluenced medially with the common nasal
meatus as was found in other ruminants (Hare,
1975). The dorsal nasal meatus communicated
dorso-caudally with the ethmoidal meatus and
frontal sinuses.

The middle nasal meatus was the
smallest in mithun which bifurcated at the level of the 1st molar tooth (Fig. 1). The middle nasal
meatus communicated with the frontal sinuses.
A similar observation was also made by Dhingra
and Kumar (1978) in buffalo. The middle nasal
meatus lay between the dorsal and the ventral
concha. The ventral deviation of the middle
nasal meatus was not recorded in the present
studies, as recorded by Sisson and Grossman
(1953) in ox and Bordoloi and Kalita (1996)
in rhinoceros.

The ventral nasal meatus was found to be the longest in zebu which extended upto the vestibule of nostril (Fig. 2). The ventral nasal meatus communicated with the common nasal meatus medially in mithun, as reported by Nickel et al. (1979) in ruminants. However, the findings were contrary to the findings of Bordoloi and Kalita (1996) in rhinoceros. These ventral nasal meatus in mithun and zebu
extended from the naso pharyngeal-meatus to the nostril in between the ventral nasal concha and the floor of the nasal cavity, as reported by Raghavan (1964) in ox, Hare (1975) in ruminants and Gupta et al. (1992) in goat.

The ethmoidal meatuses of mithun presented a narrow passage which lay in between the bony scrolls of ethmoturbinates as reported in ruminants (Nickel et al., 1979). Further, the ethmoidal meatuses of zebu connected with the opening of the frontal sinuses and sphenoidal sinuses. A similar observation was also made by Hare (1975) in small ruminants.

The common nasal meatus was longer in mithun (Fig. 1), while it was relatively more elongated in zebu. The ventral portion of the common nasal concha of mithun was wider and roomy in comparison to that of zebu. It indicated the greater passage of oxygen consumption to these high altitude animals.

The height and width of the common nasal meatus in mithun was 9.00±0.06 cm and 1.00±0.06 cm, while it was found less 8.00±0.06 cm and 0.80±0.06 cm in zebu at the level of 3rd cheek tooth. The width of the ventral nasal meatus was found to be more in both the species. The height and width of the ventral nasal meatus in mithun was 1.00±0.12 cm and 5.80±0.06 cm and was 0.80±0.06 cm and 5.20±0.06 cm, respectively, in zebu. The height was reduced in the middle nasal meatus in comparison to that of its width, at the level of 1st cheek tooth. The height and width were 0.30±0.06 cm and 1.60±0.06 cm in mithun and was 0.20±0.06 cm and 1.60±0.06 cm, respectively at the level of 1st cheek tooth in zebu.

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