

## The structure of the middle ear in the small Indian mongoose

The small Indian mongoose (*Herpestes javanicus*) is native to the Middle East, Iran and much of southern Asia. The aim of the present study is a brief discussion of the various anatomic particularities of the middle ear based on a combination of existing data and the results of the authors' study in the small Indian mongoose. For this study the middle ears of a total of 6 adult small Indian mongooses, both fresh and museum samples were explored by using dissection and plain radiography.



Fig. 1. Plain radiography of the head in slightly lateral oblique view. The star shows the bullar cavity and the asterisk (\*) depicts the tympanic cavity. The white arrow shows the septum bulla.

The 2 fresh specimens in terminal stages of disease and near death were admitted from the Park Zoo in Shiraz to our centre (Department of Anatomy and Embryology, Shiraz University, Iran). All specimens were dissected under a binocular stereomicroscope (Carl Zeiss, Made in Germany) and the bony tympanic bullae carefully opened. Two sections of the tympanic membrane (TM) were routinely determined, the smaller dorsal pars flaccida forming the upper quadrant of the TM and the larger pars tensa. In the small Indian mongoose, the pars flaccida resemble the cat and most dogs was flat. As described for all other felids, the middle ear space partitions by a complete bony septum into two separate compartments: the dorsolateral tympanic cavity and the ventromedial bullar cavity. The larger compartment, i.e., bullar cavity is lying ventral, medial and caudal to the smaller one (Fig. 1). The connection between the two regions is possible only through a narrow foramen between the septum and the petrous bone. Two foramens, i.e., the cochlear (round) window and vestibular (oval) window are located on the caudolateral portion and on the dorsolateral surface of the promontory, respectively. The opening of a bony tunnel is rostral and slightly ventral to the oval window from which the tensor tympani muscle projects to the tympanic cavity and inserts on a muscular process of the manubrium. The other ostium is related to the caudal extremity of the auditory tube that is at the rostral portion of the tympanic cavity. In the small

Indian mongoose such as all mammals there are 3 ossicles of the middle ear, named respectively the malleus, incus, and stapes. The malleus is the largest bone of the auditory ossicles with the average length 2.85 mm. It is attached to the TM via the stria mallearis, the ectotympanic via the spine (the distal tip) of the tympanic plate of the rostral process, and the incus by the head. In contrast to the well-developed head, the osseous lamina is very delicate.

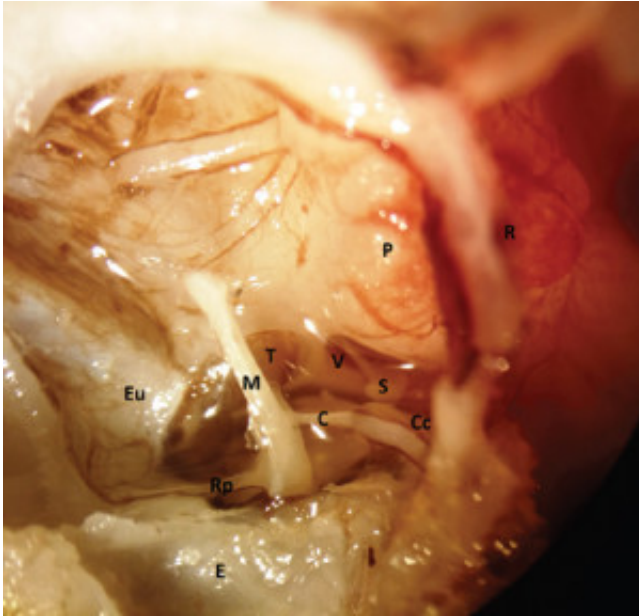


Fig. 2. Ventrolateral view of the right tympanic cavity depicting; E: ear canal; Eu: Eustachian tube; M: manubrium; Rp: rostral process; C: chorda tympani; Cc: conical cartilage; T: tensor tympani; P: promontory; R: round window; V: oval window; S: stapes.

From the anteroventral termination of the osseous lamina a thickened ventral margin projects as the rostral process; also, the tympanic plate as a pendent from the latter process is flattened onto the overlying squamosal and mediolaterally expanded. The muscular process does not arise from the neck close to the base of the manubrium as in the other carnivores, but from the inner edge of the manubrium itself. One of the outstanding features in the malleus is existence of a transverse bony channel slightly above the root of the muscular process through which the chorda tympani traverses. Our findings at least based on macroscopic observation show that the lenticular process is a distinct and separate ossicle. The conical cartilage is a structure that compressed dorsoventrally with its base situated on the dorsocaudal portion of the tympanic bone close to the TM and its apex extended toward the muscular process of the malleus (Fig. 2).

## Publication

[The architecture of the middle ear in the small Indian mongoose \(\*Herpestes Javanicus\*\).](#)

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