

## GROSS ANATOMICAL AND HISTOMORPHOLOGICAL STUDY OF RABBIT HIPPOCAMPUS (*ORYTOLAGUSCUNICULUS*)

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Received 22-5-2013 Accepted 12-7-2013

**ABSTRACT** : Gross Anatomical and Histomorphological study of Rabbit Hippocampus (*Orytolagusuniculus*) was carried out.

**KEY WORDS** : Gross Anatomy, Histomorphology, Hippocampus, Rabbit.

**INTRODUCTION** : Hippocampus is considered as an important component of the limbic system. The limbic system is responsible for emotional behavior of an animal. The cell inclusion bodies of the neurons of this structure are also considered for diagnosis of some viral diseases like rabies. Therefore, knowledge on the localization of these cells is important. Present investigation was undertaken to reveal the gross anatomical and histological observation of hippocampus in rabbit for the specific knowledge on the structural components of hippocampus.

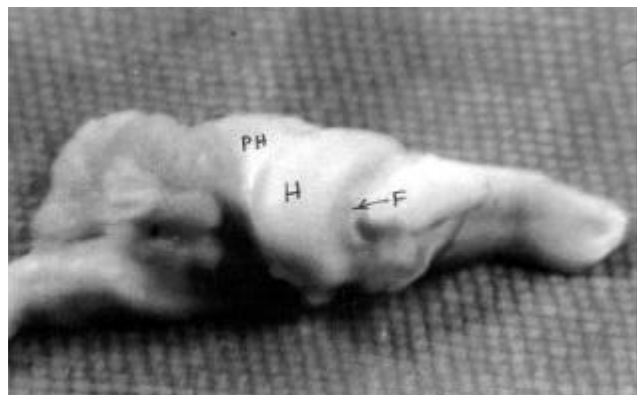
### MATERIALS AND METHODS

Brain samples were collected from 10 adult rabbits (Newzealand white) which were purchased from local market of Kolkata. The freshly collected samples were subjected to gross anatomical and gross morphometric study without tissue lapse after collection. The cranial cavity was exposed from the fronto-dorsal aspect of the head. The brain was separated from the spinal cord with the help of a knife at the level of foramen magnum. Subsequently, exposed the hippocampus and measure the length of each horn with vernier caliper.

For histomorphological study 10% neutral buffered formalin was used for tissue fixation. Thin 5-6  $\mu\text{m}$  section were cut with the help of rotary microtome and stained with Harris Haematoxylin and Eosin (Luna 1968). The micromorphometry was done with the help of ocular micrometer.

### RESULT AND DISCUSSION

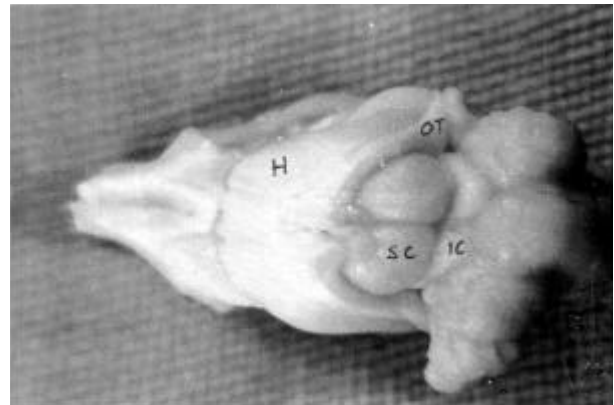
The anterior ends of each horn of hippocampus were blunt. Each horn diverged caudally and ventrally and finally terminated in a blunt, pointed and curled manner within the pyriform lobe of the corresponding cerebral hemisphere. (Photo 1) Similar Statement was made by Stephen,(1983). The posterior border of each horn was continuous with the parahippocampalgyrus and occipitotemporalgyrus, superior colliculus of the corpora quadrigemina, which was found to be very well developed in this species. (Photo 2).The ventral surface of each horn of hippocampus was highly concave but not the typical sea horse appearance in transverse section. The name hippocampus stemmed from its resemblance of the profile of Sea-horse has



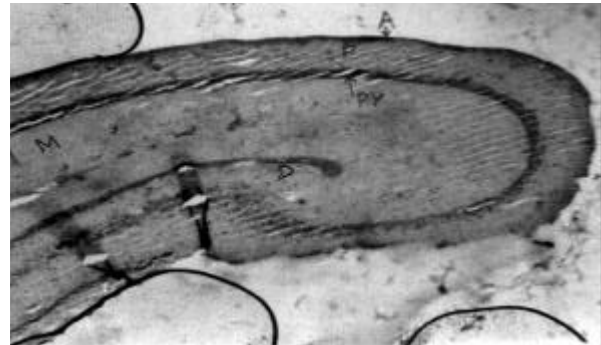
**Photo 1.** Photograph of lateral view of dissected brain of rabbit showing H-Hippocampus, PH-Parahippocampalgyrus and F- Fimbria.

also mentioned by Hamilton (1976) in rat and Amaral and Insausti(1990) in human.They appear as a “U” shaped infolded mass. The average length of each horn found to be 3.3 cm. and the width was 6.10mm.

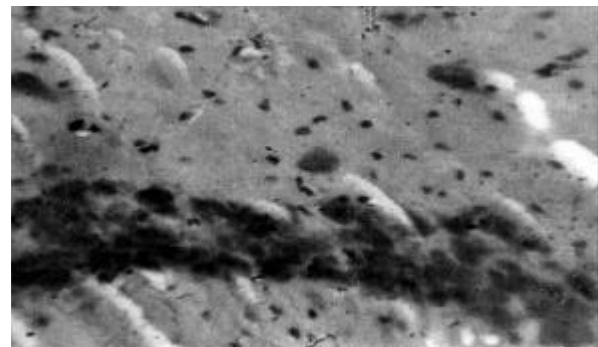
Histologically hippocampus consisted three distinct cellular layers under the cover of the outer most membrane (alveus) were identified. The alveus appear in the form of very thin membrane without any cellular component. This zone took moderately dark stain in H & E preparation (Photo 3). The alveus layer was made up of small flat neuroglial and fiber cells, in case of buffalo calf, where as in case of rabbit it was very thin and cells were very less in number.Polymorphic layer /zone was found in between the alveus and pyramidal cell layer. This was a moderately thick zone and had an average thickness of 150 $\mu$ . It accommodated plenty of small cells of different shapes and sizes. They represented neuroglial cells. The zone closed to the alveus accommodated neumerous flat neuroglial cells, which was arranged parallel to the surface. The concentration of the neuroglial cells was found to be more at the peripheral part of this polymorphic layer. A number of cells in the inner part of this zone were very less in this species (Photo 3). Amaral and Insausti (1990) mentioned that subiculum of hippocampus could be divided into three layers, a superficial molecular layer containing apical dendrites of subicular pyramidal cells. Rao (1991), who worked on histomorphological character of ovine hippocampus reported that there were four distinct layers, the stratum alveus was of variable thickness and the layer was composed of myelinated fibers (White matter), glial cells and blood vessels. Pyramidal cell layer was situated in between the polymorphic layer and molecular layer. This layer was 5-6 cells thick and accommodated loosely packed pyramidal cells. The cells at the peripheral part of this zone were observed to be larger in comparison to the cells of the inner sides. The average thickness of this zone was 45 $\mu$  and the larger variety of pyramidal cells has an average diameter of 15 $\mu$ . Average diameter of these cells ranged from 10-12 $\mu$ . The typical pyramidal shape of these cells was not found in this species. Most of large cells were oval in appearance (Photo 4). In between the pyramidal cells few neuroglial cells were also detected.Molecular layer was comparatively thick and accommodated plenty cells of different shapes and sizes. The cells were distributed uniformly throughout this zone (Photo 3).



**Photo 2.** Photograph of dorsal view of dissected brain of rabbit showing H-Hippocampus, SC-Superior colliculus, IC-Inferior Colliculus and OT-Occipitotemporalgyrus.



**Photo 3.** Photomicrograph of hippocampus of rabbit showing A-Alveus, P-Polymorphic Zone, PY-Pyramidal cell layer, M-Molecular Layer and D-Dentate gyrus.



**Photo 4.** Photomicrograph of section of pyramidal cell layer of hippocampus of rabbit.

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