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On the Brain Pattern of *Heptranchias perlo*

Hideo MASAI

(Department of Anatomy, Yokohama University School of Medicine)

Heptranchias perlo has seven gill slits, differing from recent sharks in possessing five gill slits and is regarded to be an archaic shark, as is the case with *Chlamydoselachus anguineus* which has six gill slits. This author has already reported that the external form of the brain of *Chlamydoselachus*, a living fossil, is less developed than that of a recent shark, such as *Scoliodon* (MASAI, 1961). The purpose of this paper is to describe the brain pattern of *Heptranchias perlo*, comparing it with that of *Chlamydoselachus*.

Material: The materials used were three species, one measuring about 80 cm. and the other two measuring about 20 cm. in body length. These were fished from Japanese waters and preserved in formalin and in a refrigerating chamber. This author wishes to express his thanks to Dr. T. ABE and Dr. T. KAMOHARA.

Observation: (figs. 1-6) The brain of *Heptranchias perlo* is flattened in general, and there is a large space filled with connective tissue between the brain and cranium. The depressed olfactory bulb is located close to the nasal sac. The olfactory tract is slender in the species of 80 cm. in body length and extremely short in the one of 20 cm. in body length. The terminal nerve was taken out in preparation. The lateral lobes of the telencephalon on both sides are distinctly separated from each other and the recessus neuroporicus is much more deepened than that of *Chlamydoselachus*. The lamina supraneuroporica and infraneuroporica become flattened, and telencephalon medium is relatively long in the species of 80 cm. in body length, while the lateral lobes are seen swollen, and the telencephalon medium is short in the species of 20 cm. in body length.

The diencephalon possesses the intensely developed hypothalamus, hypophysis and saccus vasculosus. The habenular nucleus is visible on the dorsal surface. The optic nerves cross at acute angles. The tectum opticum is elongate ovoid and flattened, compared with that of *Chlamydoselachus*.

The corpus cerebelli is symmetrical and rhomboid in shape in the dorsal view, shows no furrows and does not cover the tectum opticum. The auricle is developed out of proportion to the dimensions of the corpus cerebelli.

The medulla oblongata is flat and more slender, compared with that of *Chlamydoselachus*. The crista cerebellaris extends toward a rostral quarter of the oblongata.

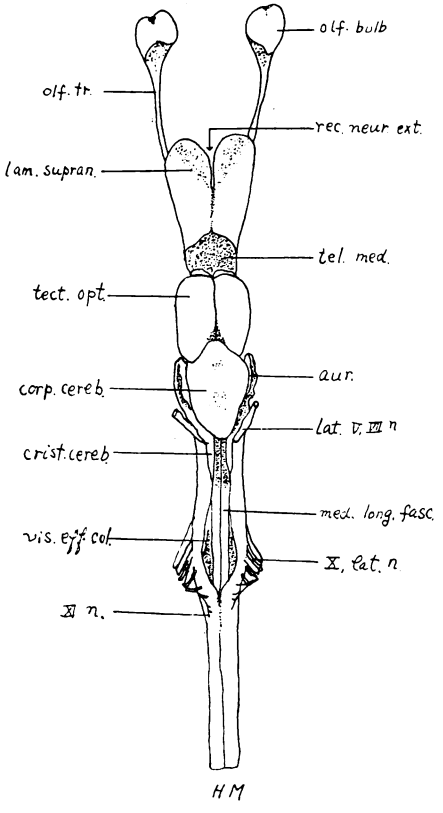

Fig. 1. Dorsal view (body length 80 cm.) (×1)

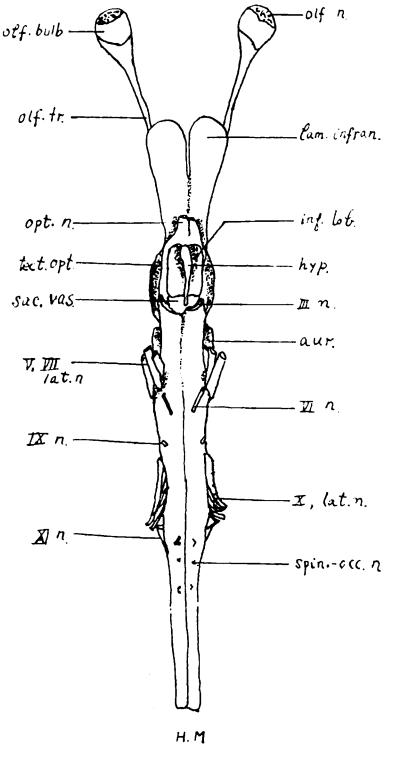

Fig. 2. Ventral view (body length 80 cm.) (×1)

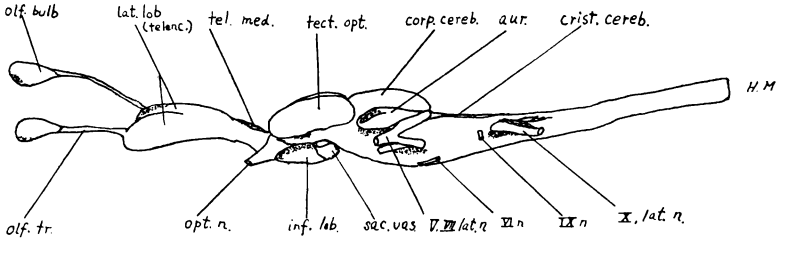

Fig. 3. Lateral view (body length 80 cm.) (×1)

In the floor of the rhomboid fossa, each column is limited by deep sulci. The lobulation does not appear in the afferent visceral column. The accessory nerve appears distinctly, as it does in *Chlamydoselachus*.

In brief, the brain pattern of *Heptranchias perlo* resembles that of *Chlamydoselachus* in many aspects and is primitive, compared with recent sharks.

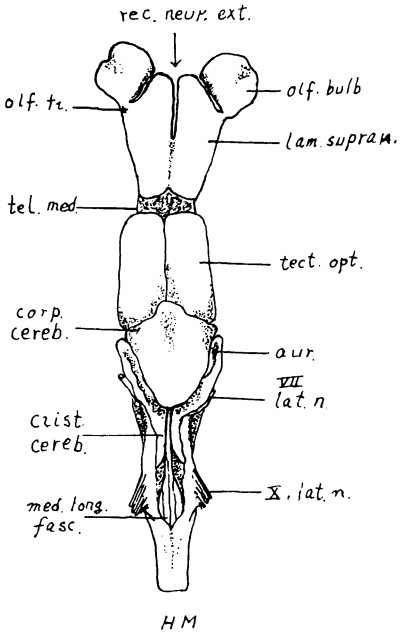

Fig. 4. Dorsal view (body length 20 cm.) (×7/3)

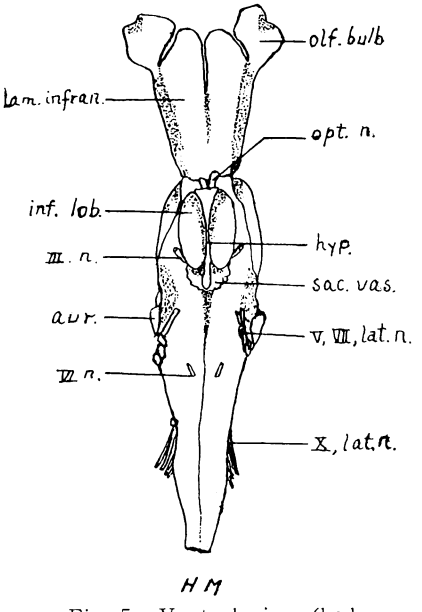

Fig. 5. Ventral view (body length 20 cm.) (×7/3)

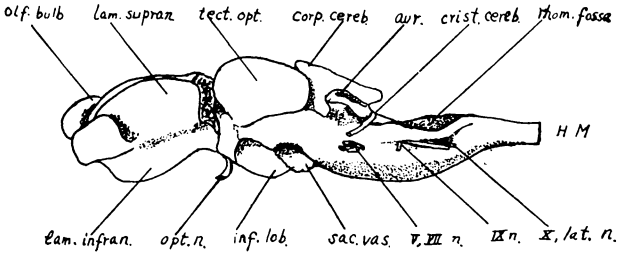

Fig. 6. Lateral view (body length 20 cm.) (×7/3)

References

MASAI, H. 1961. On the brain pattern of *Chlamydoselachus anguineus*. Yokohama Med. Bull., xii, 231-238.