

# 北京大學論文集

(青魚胸及消化器觀察)

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## 青魚腦及消化器之觀察

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Notes on the Brain and Digestive Organs  
of *Ctenopharyngodon idellus*

T. L. Tchang and Y. C. Ching

This species, *Ctenopharyngodon idellus*, is a common food fish in the fresh-water of China, but its internal anatomy has not been well studied. We have the opportunity to dissect several specimens for the study of its brain and digestive organs. The following description is the result of our observations.

The Brain.....The brain is relatively small. It fills only a part of the cavity of the cranium. There is a considerable space which is filled with a fatty fluid mass. This space is much less in young specimen than in adult. The olfactory lobes are oval and large, lie a far distance from the cerebrum. They are removed to juxtaposition with the olfactory capsule, with a concomitant prolongation of their crura. The crura are flattened and enormously elongate, about 10 times the length of the olfactory lobe. Each crus contains two distinct tracts, the radix mesalis and radix lateralis. The former is smaller and situated in the inner and the latter larger and situated in the outer side. The cerebrum is much smaller than the optic lobes or the cerebellum. There are two hemispheres well separated but

uniting in the lower portion. Each lobe of the cerebrum is nearly oval. There are the frontal and occipital fissures on the dorsal surface of each lobe. The twist-brain is entirely hidden from the dorsal aspect by the large optic lobes. The epiphysis or pineal body lies between the cerebrum and a pore dorsally. There is no parietal organ. On the ventral aspect the hypophysis or pituitary body and hypoaria or lobi inferiores are more prominent. The hypoarium is a pear-shaped body with the smaller end directed cephalad. At its antero-dorsal side there is a flattened body, the cinereum which is about half as long as the hypoaria. The hypophysis is slightly oval and is attached to the infundibulum between the anterior ends of the hypoaria. The saccus vasculosus is inconspicuous. In front of the hypophysis there are two optic nerves which simply cross after leaving the brain and do not form a chiasma. The mid-brain presents the two optic lobes dorsally. Each lobe is oval. It is the largest part of the brain in small fish but it is smaller than or equal to the cerebellum in large specimen. The ventral surface of the mid-brain is entirely occupied by the hypoaria and hypophysis. The cerebellum is single and well developed, much larger than the cerebrum and a little smaller than the optic lobe. The anterior part is closely appressed to the subjacent optic lobes. The posterior part is free and directed obliquely dorso-caudal, and is flattened somewhat. As view from above, the cerebellum is nearly round with anterior border broader than posterior one. The entire extent

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on the fourth ventricle is exposed. There is a vertical groove on the posterior end. The medulla oblongata closely resembles the spinal cord but much wider and higher. It is nearly triangular in outline, the dorsal parts of its side walls being wedged apart. There are two prominences on each side. The fourth ventricle lies between them and its membranous roof extends from the mesal surface of the side to that of the other. The ventricle is closely behind the vagus nerve which is the caudal limit of the medulla oblongata. The lobe of vagus is not developed.

The digestive organs.....The mouth is large and has no teeth in it. On the floor of the mouth there is the tongue which forms a flat, slight elevation. It is provided with papillae on its posterior region and supported by the second or hyoid arch. Four vertically elongated gill-slits are present on each side of the pharynx. There are two series of pharyngeal teeth. Each is comb-shaped at the apex and has a series of grooves on both sides. Behind the pharynx is the oesophagus. It is a short and wide tube hardly if at all marked off from the stomach. The pneumatic duct sends off from the dorsal aspect of the oesophagus to the air-bladder. The stomach is slightly dilated. It consists of a broader cardiac and a narrower pyloric portions. There are no pyloric caeca on the pylorus. The intestine is convoluted and without spinal valves. It is longer than the body of the fish and opens to the exterior by the anus which is anterior to the urinary and generative apertures. The cloa-

ca is absent. The mesenteries are present along the intestine. The liver is large and grayish brown in colour. Three lobes may be distinguished but they are not conspicuously distinct from each other. It lies immediately behind the pericardial membrane and extends backward, further on the right than on the left side. The right lobe is longer, broader and thicker at anterior part, slender in the middle. Its posterior part forms a triangular mass with the point cranial. The median lobe is broad and flat connected by three stripes of the liver mass of the right lobe. The gall-bladder is large and long situated on the middle part of the median lobe of the liver and the dorsal part of the intestine. It is green in colour and like a long necked flask. There are three slender short hepatic ducts of the liver and a larger cystic duct of the gall-bladder. They unite to form a short duct, the ductus communis choledochus which opens into the junction of the stomach and the intestine. The left lobe narrower at base and connected to the median lobe by a transverse lobule. The spleen, which is substantially a lymphatic gland of dark-red colour, is attached to the left and median lobes of the liver. The pancreas is inconspicuous.

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張春霖 荆玉成

腦較小，僅佔腦腔之一小部，餘部滿充油體。嗅葉橢圓形而型大，距大腦甚遠，腦脚（Crura）細長扁平，長約十倍於嗅葉，每腦脚具一中絲及一側絲，前者位於內而形小，後者位於外而大，二者緊貼並行。大腦較視葉或小腦為小，分為兩半球，其下相連。大腦之每葉近橢圓形，上有前額骨溝（Frontal fissure）及後頭骨溝（Occipital fissure）。間腦完全被視葉蓋藏，腦上腺位於大腦視葉之間，為袋狀，具褶皺之壁，背面開一小孔。無顛頂器官（Parietal organ）。腹面有顯明之腦下腺（Hypophysis）及下葉（Hypopharynx）下葉為梨狀體。腦下腺近橢圓形，附着於漏斗體及下葉前端之間。血脈囊（Saccus vasculosus）不顯明。在腦下腺前有二視神經由腦伸出，但不形成交叉（Chiasma）。中腦背面有二視葉，每葉為卵形，為腦之最大部分，腹面完全為下葉及腦下腺所佔。小腦甚發達，大於大腦而小於視葉，前部密接於視葉下面，後部扁平，前部略寬於後部，第四腦腔完全露出。後端具垂直之深溝，延髓似脊髓，然較寬，外廓略似三角形，迷走神經為其與脊髓之界線，迷走神經根不如鯉魚者之膨大。

口大無齒，口內有扁平微凸之舌，有四個長而垂直之鰓裂開口於咽喉兩側，有兩列喉齒。咽喉後為短而寬之食道，與胃無顯着之界限，氣管（Pneumatic duct）由食道之背面生出下通於鰓。胃略膨大，賁門闊而幽門窄，幽門無盲腸，腸迂曲而較身體為長，內無螺旋瓣，肛門位於生殖孔之前。肝臟為灰褐色，可分三葉，彼此相連，無顯着分明之界限，位於圍心膜之後，走向左右兩側，右葉前部較寬而厚，中部較細，後部成三角形，中葉扁平，有三條與右葉相連。膽囊位於腸之背面肝中葉之中部，為綠色長頸之囊，三條細肝管（Hepatic duct）與粗長之胆管（Cystic duct）相合而成通於胃之普通胆管（Ductus communis choledochus），左葉基部較窄與中葉相連。脾臟為紫紅色，在肝中葉及左葉上。胰臟不顯明。



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