

FORMATION OF STOMODAEUM AND NERVOUS SYSTEM IN THE HORSESHOE CRAB,
TACHYPLEUS TRIDENTATUS (CHELICERATA: MEROSTOMATA: XIPHOSURIDA)

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Inhibitors of DNA synthesis induce the monsters with separated embryonic areas which are separated into anterior and posterior pieces. Also in these monsters, the position of brain is abnormal. In the normal horseshoe crab, Tachypleus tridentatus the alimentary canal passes through the central nervous system. However, this crossing of alimentary canal and central nervous system is lost in some monsters (Itow, 1982, 1985).

We hoped to solve the mechanism of formation of stomodaeum and nervous system by means of the analysing the monsters. But we did not clearly know the process of formation of stomodaeum and nervous system in the normal embryos, neither. Therefore, we examined the process of the stomodaeum formation in normal embryos at first. In this report, we describe the formation of alimentary canal and central nervous system of normal embryos and larvae.

We found new following facts, concerning the formation of alimentary canal and central nervous system of T. tridentatus.

1) The stomodaeum is a tubular structure and appears in front of the first cephalothoracic appendages at stage 14 (the stage of appearance of cephalothoracic appendages).

2) The mouth migrates posteriorly at stage 18 (the stage after the 1st embryonic moulting). It becomes situated in the position between the 3rd cephalothoracic appendages and 4th ones, after the 3rd embryonic moulting (stage 20).

3) The nervous system seems to be formed after stage 11 and 12 (the

stage of active morphogenetic movement). The cell-masses of the nervous system are clearly observed after stage 16 (the stage of development of cephalothoracic appendages). After stage 19 (the stage after the 2nd embryonic moulting), the cell-masses of nervous system are easily stained by eosin.

4) Adult horseshoe crabs have 7 pairs of abdominal appendages and 10 pairs of abdominal segments. The 1st instar larvae have only 4 pairs of abdominal appendages, but have 16 pairs of ganglia (6 cephalothoracic and 10 abdominal ones). The number is the same as that of adults. That is, the 1st instar larvae already have the same number of segments as adults.

5) There was the thought that extra segments existed at the position between the prosome and opisthosome, and were thought to have no appendages. However, our detailed observation showed that there never be such a segment.

6) There is the commissure of ganglion of the 6th cephalothoracic segments in the 1st and 2nd instar larvae. Shoji (1929) said the adults do not have the commissure.

7) It has been known that all cephalothoracic appendages and the 1st abdominal appendages (chilarias) belong to the prosome. We also found the following fact. The ganglion of the 2nd abdominal segment exists in the prosome of the 1st and 2nd instar larvae.

References

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