

生命科学

## 隆线蚤孤雌卵胚胎发育的形态学研究

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**摘要** 采用组织学方法较为系统地研究了隆线蚤 (*Daphnia carinata*) 孤雌卵 (夏卵) 胚胎发育的全过程。隆线蚤夏卵为中黄卵, 室温 24 °C 下, 整个胚胎发育过程需 45 h 左右。根据隆线蚤胚胎内部结构特征及外部形态学变化, 将其胚胎发育分为卵裂期、囊胚期、原肠期、前无节幼体期、后无节幼体期、复眼色素期和准备孵化期 7 个时期。卵排至孵育囊约 40 min 后开始表面卵裂。卵裂至 256 细胞时, 胚胎发育进入囊胚阶段, 在卵表形成一薄层细胞层, 囊胚腔则全被卵黄颗粒所充塞。囊胚后期, 囊胚层细胞分裂加快, 相互挤压向囊胚腔中移入形成原肠胚。随后, 胚胎外部形态开始出现变化。首先在胚胎前端出现头部的三对附肢原基 (两对触角原基及一对大颚原基), 胚胎发育进入前无节幼体期; 随后胸节分化, 胚胎发育进入后无节幼体期, 并形成胸肢、壳瓣和肠道等结构。复眼在复眼色素期的基础上, 逐渐发育形成完整的复眼结构, 同时其他各组织器官也不断发育完善。至准备孵化期的胚胎结构与幼体已基本相同。以上研究结果可为深入研究枝角类胚胎发育的机理积累基础生物学资料。

**关键词** [隆线蚤; 胚胎发育; 形态学](#)

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## Morphological study on embryonic development of the parthenogenetic egg in *Daphnia carinata*

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### Abstract

The parthenogenetic egg (PE) is centrolecithal and its embryogenesis lasts about 45 hours at 24 °C. According to the morphological and histological changes, the embryonic development of *D. carinata* could be divided into seven major stages, i.e. the cleavage stage, blastula stage, gastrula stage, egg nauplius stage, egg metanauplius stage, embryo with eye pigments, and prepare hatchling stage. The superficial cleavage of PE did not happen until approximately 40 minutes after egg laying. At the end of cleavage, the embryo consisted of 256 cells and reached the blastula stage at which a large part of the blastocoele was filled with yolk granules, accompanying by the formation of a thin sheet of divided cells. The cell division rate was accelerated and gastrulation took place by means of immigration of blastodermal cells at the end of this stage. Afterwards, the morphological changes in embryo development became remarkable. The egg nauplius stage was characterized by the appearance of the rudiments of two antennae and a mandible in the head region of the embryo, while the egg metanauplius stage characterized by the formation of the thoracic segments, thoracic limbs, carpace, and guts. At the eye pigments stage, the embryo was found presenting the eye pigmentation in the well developed compound eyes. Simultaneously, other physiologically important tissues and organs

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started to develop. During the last prepare hatching stage, the organelle structure in the embryo could be quite similar to that in the larval. The results could accumulate basic biological information for further research on embryonic development of Cladocera.

**Key words** [Daphnia carinata](#) [embryonic development](#)  
[morphology](#)

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