

A survey of sexuality and modes of reproduction in aquatic invertebrates reveals that with retention of Embryonic Stem Cells (ESCs) in them, acoelomates and eucoelomates can also reproduce asexually. However, pseudocoelomates and hemocoelomates have not retained ESCs, as they do not reproduce asexually. This book comprehensively elucidates almost all aspects of reproduction and development in Crustacea covering from anostracan *Artemia* to xanthid crabs. With inclusion of sessile, sedentary and slow motile groups, gonochorism in Crustacea is limited to 92% only. The other crustaceans employ hermaphroditism or parthenogenesis. Over 96% crustaceans brood eggs on their body. A 50% reduction on generation time affords tropical crustaceans to produce 10 times more eggs than their temperate counterparts. The hallmark strategy of brooding costs time and energy is revealed by the fact that the egg shedding calanoids, euphausiids and penaeids are 3-20 times more fecund than their respective counterpart brooders. A consequence of brooding is the liability to reproductive senescence. However, the parasitic bopyrid brooders have escaped from the senescence. The asexual reproduction in the exceptional hemocoelomic parasitic colonial rhizocephalans simulates more of regeneration than of agametic cloning of a whole animal. To survive and flourish in ephemeral aquatic systems, many entomostracans have 'invented' cysts or their equivalents like diapausing embryos/larvae, ephippia and so on. In Crustacea, sex is genetically determined at fertilization. The ostracods have employed numerically more X chromosomes to determine the female sex, whereas the anostracans B chromosomes to determine the male sex. Unlike vertebrates, endocrine and spermatogenic functions are clearly separated into androgenic glands and testes. As a consequence, sex is differentiated prior to metamorphosis/birth. However, sex differentiation process may be disrupted by endocrine disruptors, parasites and food. Surprisingly, food limitation induces parthenogenic production of males in daphnids but its abundance sex change from males to females in copepods.

K27088



CRC Press
Taylor & Francis Group
an informa business

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