About The Increase Of Reproductive Types In The Development Cycle

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ABSTRACT

Ontogeny lasts longer than the developmental cycle. The length of an animal or plant development (life) cycle is determined by the number of generations (generation) in a year or the number of past spring (years) for one generation. The process also includes forced peace and pauses. This article discusses the multiplication of reproductive species in the development cycle.

Keywords: ontogeny, development cycle, metagenesis, heterogeneity, pedogenesis, neotenia, polyembryonia, hermaphrodite.

Main part

In animals, a normal (correct) developmental cycle occurs mainly in vertebrates, with a metamorphosed developmental cycle occurring in many animals, especially invertebrates [2, 5, 10]. The developmental cycle of animals goes through different stages and the exchange of reproductive species. They are:

1. Metagenesis. Metagenesis is one of the secondary forms of generational reproduction in which the offspring that emerge as a result of sexual reproduction reproduce asexually. Metagenesis (Greek meta-after, genesis-development) was first described by J. in lower animals. Identified by Steenstrup (1842). Such a development cycle occurs in pits [2, 5, 12].

2. Heterogony. In such a developmental cycle, different sexes (separate sex and parthenogenetic, some sex and hermaphrodite, hermaphrodite and parthenogenetic) are bred. Heterogony (Greek for heteros-variety) was first defined by Grobben (1882). This method of reproduction is found in rattlesnakes, crustaceans, flat and round worms and insects [1, 4, 6]. The number of heterogeneous cycles during the year can vary depending on living conditions, temperature, nutrition. For example, the amygdala of the kolovrats is formed from an egg fertilized in the fall. The amygdala lays an egg that develops without fertilization and chromosome reduction. The amygdala gives birth to a diploid offspring.

The eggs produced by the autumn offspring of the mycotic sac of the kolovrats can develop both parthenogenetically and through fertilization. From the parthenogenetically developing egg only samets are formed, the fertilized egg is diploid and they develop after the winter dormancy period. In the spring they develop an amygdala. Daphnia reproduce by parthenogenesis in spring and fertilization in autumn. The change in the form of reproduction is related to temperature, parthenogenetically at 240 C, sametsi occurs at 160 C and fertilization occurs, and at 80 C the number of samets increases further. Even in dry water, daphnia multiplies by fertilization [2, 8, 12].

Rhabdias buffonis (frog lung parasite) has two generations: parasitic and free-living. The parasitic offspring develop from the proteander samka. This samka first grows sperm, then eggs. The fertilized egg then descends from the frog's lungs into the intestines, from which it exits into

the external environment. In the soil develops a free-living generation consisting of samka and samets. The productivity of the offspring of this generation is low, they lay fewer eggs and larvae emerge from it. This larva is swallowed by the frog with food and pieces of soil, and another generation of parasites develops in its lungs.

Thus, the emergence of an unregulated type of reproduction in the ontogenesis of some organisms leads to the emergence of many individuals in a short period of time through asexual reproduction, but sexual reproduction does not disappear completely. The unregulated type of reproduction emerged as an adaptation in the process of evolution of individual sexes and hermaphrodites that replaced individuals of different sexes with less encounters and led to an increase in the number of individuals.

3. Pedogenesis. Pedogenesis is a method of reproduction of some invertebrates in which the next generation larva is formed from an unfertilized egg. It is a type of parthenogenesis that is called N.P. Wagner (1862) first identified the two-winged insect in the Miastor generation. The term pedagogy was coined by K.M. Ber (1865) first used it (Pedogenesis means Greek-born child, infant). In pedagogy, the female larva, which is formed in the mother's body, is initially fed by the tissues of the mother's body as an endoparasite. Then the mother's body tears out the cuticle and goes out to live a free life. Sometimes, after several parthenogenetic larval generations, a generation emerges that produces samka and samets, and they reproduce sexually. Pedogenesis is an evolutionary device designed to compensate for the low level of responsibility of a sexually mature animal. For example, members of the Micromalthidae family of beetles are characterized by the appearance of both live-breeding and egg-laying pedogenetic larvae. Pedogenesis is also found in monogenesis, trematodes, and crustaceans (Podon genus), amphibians, most gastropod mollusks, ninatans, freshwater hydras, crustaceans, oligochaetes, and many plants. Embryonic development in sporescysts and radii is also pedogenesis [7, 11].

In the process of evolution, as a result of natural selection, juvenile or larval traits of their ancestors were preserved in sexually mature organisms. In sexually mature individuals, the characters combine differently to provide a variety of taxonomic groups. The basis of pedomorphosis is a change in the ratio of sexual and somatic developmental rates. As a result of a decrease in the rate of somatic development or an acceleration of sexual development, sexual maturation occurs when juvenile or larval morphological signs are preserved in the body. At the same time sexual maturation slows down, juvenile or larval morphological signs in the organism remain as definitive signs in the pedomorphic organism.

Two types of pedomorphosis: neotenia - somatic development lags behind reproductive activity; progenesis - differs in that sexual development precedes relative to somatic development. In this case, even if the body retains juvenile signs, the germ cells and gonads are fully developed.

M.V.Mina, J.J. According to Dgebuadze (2008) hypothesis, pedomorphoses, which are responsible for the appearance of morphological differences in Labeobarbus (Barbus) intermedius, are the result of changes in the system of hormonal regulation of development. The induction of the ontogeny of bony fish and amphibians, its speed, duration, and timing are largely dependent on thyroid hormone (thyroid). It has been found that thyroid hormones are also involved in the regulation of metamorphosis of flounder [2, 3, 7].

Most species of salamanders are pedomorphic. There are 10 families, 59 genera and 500 species of salamanders, and their development cycle consists of stages: egg (passes in water), larva (lives in water), sexually mature animal (lives on land). The larvae of pedomorphic species of caudal amphibians do not complete metamorphosis, but reproduce and reproduce without losing larval traits and aquatic habitat.

The salamanders Amphiumidae, Proteidae, Sirenidae, Ampycomatidae, Dicamptodontidae, Plethodontidae are pedomorphic families, of which Ampycomatidae, Dicamptodontidae, Plethodontidae also have RAG-1

(recombination of enzymes, ribomosin allois, Ranom, alkaloids), A rare occurrence of mitochondrial DNA in pedomorphic species of Plethodontidae has been identified [3, 12]. The limited genetic divergence of pedomorphic species suggests that they are related to each other and to other family species that are pedomorphic. The basis of pedomorphosis in tailed amphibians is the reconstruction of the genome structure.

In caudal amphibians, metamorphosis can be studied by stopping the hypothalamic-pituitary-thyroid gland system. Normally produced thyrotropin-releasing factor hormone in the hypothalamus is released from the hypothalamus and accelerates the secretion of thyrotropin-stimulating factor from the pituitary gland. It in turn stimulates the synthesis of the hormones thyroxine and thyroidin in the thyroid gland. Thyroxine is a passive hormone that is converted to the active thyroid hormone under the action of monodeiodinase. Both hormones can be produced in thyroid cells, and both bind to receptors, helping to ensure the normal passage of physiological processes from the larva to the sexually mature organism.

Hereditary impairment of the synthesis and secretion of thyrotropin-releasing factor leads to disruption of metamorphosis in tailed amphibians Ambystoma gracile and Atigrinum. Disruption of the synthesis and secretion of thyrotropin-stimulating hormone in the pituitary gland has led to the disappearance of metamorphosis in A. mexicanum, including the fact that the outer shell remains an aquatic animal, and the larval symptoms remain in other larvae. Hereditary impairment of the synthesis and secretion of thyroxine and thyroidin in the thyroid gland, or the absence of receptors that sense these hormones, stops the metamorphosis of Siren, Nectunus, and Euryceaneotenes [1, 2, 7, 11].

The artificial delivery of thyroidin and thyroxine hormones to Euryceaneotenes leads to metamorphosis in a sexually mature individual. Siren and Nectunus do not respond to any concentrations of thyroxine and thyroidin, and their development is maintained at the larval stage. In addition, permanent amphibians from caudal amphibians (cave proteus Proteus anguinus), blind triton (Typhlomol gerathbuni), and others sexually mature in the larval stage and live in water.

From the plant world, pedomorphosis also occurs in mosses, plauns, ferns, open-seeded, closed-seeded. In particular, the body of members of the Areaseae family is simple in structure, due to the fact that their ancestors stopped developing in the early stages of ontogeny. In some plants, the transition from a tree shape to a transitional form is also the result of a fall in the final stage of development. Simplification of the gametophyte in pteridophyta and reduction of sporophyte in Bryophyta is neotenia, but in both cases reproductive function is preserved.

Phenotypic changes from pedomorphosis plants to primates are a common mechanism. A relatively small number of genetic changes that do not disrupt the genetic ratio are required for the rate of development to change through pedomorphosis. The morphological signs formed as a result of pedomorphosis are the morphological signs of the juvenile period. Organisms maintain the functional integrity of traits formed during neotenia or progenesis during evolution. This indicates a high evolutionary potential of pedomorphosis.

Thus, the appearance of morphological, physiological, and other traits of new taxa begins with their ancestors, but these traits may not be preserved in sexually mature organisms.

The importance of neotenia in evolution. In the process of evolution, changes may occur in the embryonic development of not only organs but of an entire organism that differ from the development of ancestors. In many cases, the early or middle stages of development squeeze out the later stages. As a result, ontogeny ends faster. In ontogenetic development, the functions of the shortening or descending stages are performed by the earlier stages.

It is a pedomorphosis, caused by changes in the environment during the evolutionary process and the emergence of rivals. From a single hereditary larva emerges several sporocysts, from which many radii, from which many cercariae [2, 5, 6]. Pedogenesis also occurs

in plants. For example, according to Takhtadjyan, lemmas are not derived from adult forms, but from his apostasy. The structure of this aquatic plant has become so simple that as a result they have become more like algae than flowering plants. Pistia is a small plant that lives by swimming in water and is common in tropical countries. When ripe, it does not look like a lemma at all. Because it has only vegetative organs such as small stems, leaves and roots. In the structure of the seed, in the germination, in the state of the stalk, many similarities are observed between the lemmas and between them. Comparative morphological studies show that the lemna is actually a leaf in the distal part above the so-called pockets of the vegetative body, corresponding to the apex or branches developed in the pockets. However, there is a difference between them. If the stem of Pistia produces several branches and many buds, the vegetative body of the lemma has two side buds and reduced vegetative organs, indicating that they are derived from a single plant. These data again show that the lemmas originated not from adult forms but from their aphids.

4. Polyembryonia and duration of embryonic development. The development of several embryos (twins) from a single zygote is called polyembryonia. Twins developed from one egg are of the same sex. Species-specific and random polyembryons are distinguished. Species-specific polyembryonia is found in mosquitoes, parasitic parasitic insects, armor beetles. For example, in the Litomasix genus, up to 3,000 larvae can develop from a single zygote. From the zygote of Dasypushybridus arises 7-9 embryos from armor, each of which develops in a separate amniotic sac, but in a common chorion. Random polyembryonia can occur in all representatives of the animal kingdom [2, 5, 7].

Three types of polyembryonia occur due to three causal effects on this process. In blastodermic polyembryonia, asexual reproduction specific to the adult animal begins during embryonic development. For example, two zooids develop in the body of the Diplosoma larva. In the body of the pyrosome, four primary blastozoids are formed. The second type of pleembryonia is called pedogenesis, and parthenogenetic reproduction based on pedogenesis begins during embryonic development. Such polyembryonia is characteristic of monogenetic mammals. The third type of polyembryonia occurs due to some disruption at a certain stage of normal embryonic development, unrelated to any type of reproduction. Such true polyembryonia occurs in mammals, mice, some insects, and some mammals [2, 5, 10].

5. Interchange of polymorphic hermaphrodite generations. Such a developmental cycle was first identified by Woodhead (1931), who believed that the developmental cycle of trematodes takes place with the succession of at least three polymorphic hermaphrodites (sporocysts, redia, marit).

In the process of evolution, the individual development of the animal world and the development cycle of the species have changed. During ontogeny, the organism grows, develops, participates in the process of reproduction, dies [5,10].

A development cycle is a set of cyclically repetitive cycles between two identical developmental phases during the development of a species. The development cycle includes types, stages, and periods of ontogeny that include different types of reproduction. The direct and metamorphosed types of ontogenesis, the embryonic and postembryonic stages, and the many stages of each stage (e.g., the period from fertilization to implantation in human embryonic development, the period of implantation, the period in which the placenta is formed) differ. The developmental cycle of most invertebrates takes place with alternating sexual and asexual reproduction. During the development cycle, features that are important for the survival and development of the species, such as reproduction, propagation, and protection from various adverse conditions, are realized. With the emergence of new adaptive traits during the evolution of the species, the ontogeny and developmental cycles also change [1, 5].

Thus, ontogeny is specific to all animals and plants, and changes that occur naturally, sequentially, or suddenly at different stages of

ontogeny are determined by growth, reproduction, development, and organism life [7, 9, 12]. In different organisms, each stage of ontogeny has its own characteristics and duration. The diversity of ontogenesis is the adaptation of an organism to changing living conditions that occurs during evolution.

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