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IS MOINA'S ADAPTATION TO LIFE IN PUDDLES COMPLETE?

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ABSTRACT

The results of histopathological examination of Moina macrocopa (Straus, 1820) (Cladocera, Crustacea) from periodically drying puddles unpolluted with toxic substances are presented. In some of the examined individuals, oocytes disintegrated and pathological changes occurred in the "placenta". Puddles are the natural habitat of this species. The pathological condition of a species living in its natural environment is evidence that its adaptation to life in it has not yet been completed.

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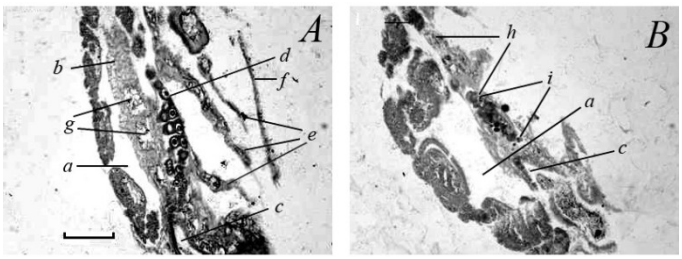
INTRODUCTION

Crustaceans originated in the sea and from there they moved into continental water bodies. Cladocerans first adapted to life only in large continental water bodies. The living conditions in them differ from the living conditions in the sea the least compared to other continental water bodies. Then cladocerans began to adapt to life in small continental water bodies. The habitat in them differs from the habitat in the sea more. [1] The habitat differs even more from the living conditions in the sea in periodically drying up puddles. Cladocerans began to adapt to life in them last of all. Very few species have adapted to live in them. *Moina macrocopa* (Straus, 1820) (Moinidae, Cladocera, Crustacea) is one of them. The time during which the ancestors of moina adapted to life in puddles is incomparably shorter than the time they lived in permanent water bodies. Has the adaptation of moina to life in these micro-reservoirs been completed during this time? The purpose of this work is to discuss this issue. Moina were caught with a net from three puddles on a dirt road near the village of Borok in the Yaroslavl region. Moina were caught on May 31, June 5, 8, 10, 15, July 1, 13 and 31. For control, the crustaceans were taken from the aquarium. A total of 865 individuals from the puddles and 100 individuals from the aquarium were examined using a histological method. Fixation in Bouin's fluid. The thickness of the paraffin sections is 7 μm. Staining with iron hematoxylin according to Heidenhain. In 19.5% of the examined individuals, there were pathological changes in the tissues. In the ovaries, there was a breakdown of oocytes. Their breakdown began with the loss of nuclei (Fig. Bh). Then the oocytes broke up into small round, strongly stained units (Fig. Bi). There was a pathological change in the "placenta" (Fig. Ag). This organ serves to provide nutrition to parthenogenetic embryos growing in the brood pouches. In the aquariums, there was no breakdown of oocytes or pathological changes in the "placenta" of the crustaceans. The puddles from which the moina were collected for examination were not contaminated with toxic substances.



Longitudinal sections of Moina macrocopa from puddles. A–an individual in which the oocytes in the ovary do not disintegrate, B–an individual with disintegrating oocytes

Notations: a–space of the brood pouch, b–"placenta", an organ that secretes nutrients for the needs of the embryos developing in the brood pouch, c–midgut with contents, d–ovary, e–legs, f–cross-section of the shell valve, g–cavities in the placenta, the meaning of which is unclear.

There were no agricultural lands where toxic pesticides could be used or industrial enterprises polluting the water of the puddles with toxic substances nearby. The cause of the described pathological processes is sharp, frequent and rapid changes in the living conditions of moinas. The small volume of water in puddles makes them very susceptible to random changes in weather and other influences. Each such change requires the moina's body to redirect the flow of energy and nutrients from oogenesis to adaptation to the newly arisen environment. Because of this, the growing oocytes do not receive enough nutrition and disintegrate, and the "placenta" changes pathologically.

The pathological condition of moina in its natural habitat indicates that its adaptation to life in puddles is not yet complete.

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