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PECULIARITIES OF THE MOLTING PROCESS IN CRAWFISH OF DIFFERENT SPECIES

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Introduction

As all crustaceans, crawfish have external exoskeleton (shells) that limit their growth. Therefore, they have to change their shell to a new one to increase in size. It may seem like a simple process, but it's not. Molting is the most stressful and important period in the life of crawfish. This is the time when they are the most vulnerable and exposed to death. Molting depends on the environment and is controlled by the endocrine system, which is located near the eyes of crawfish (movable stem). This process consists of 4 stages: proecdysis (pre-molt stage); ecdysis (molting process); metecdysis (post-molt stage) and anecdysis (intermolt period).

Taking the above into account, the research aim was to learn the molting process of *Cherax quadricarinatus* so called Red Claw crayfish and *Astacus astacus*.

Results

There was a liveweight decrease of crawfish at the stage of molting due to the discharge of the old shell. For the molting process, crawfish accumulate a large amount of water in their body, which enters the body both through the gills and when absorbed from the outside. The weight of the discharged shell of *Astacus astacus* was: the first molt — 3.81, the second one — 4.16 g, *Cherax quadricarinatus*: the first molt — 4.70; the second one — 5.16, the third one — 5.50 g. The average duration of the ecdysis period was 2.4 hours for the first type of crawfish and 1.9 hours for the second one.

During the metecdysis period, crawfish begin to produce the chitin synthesis enzyme, which is important for creating and strengthening a new exoskeleton. In addition, the calcium released from gastrolith provides calcification of such important parts of the body as the mouth and limbs. Liveweight of *Astacus astacus* at the beginning of metecdysis was: 43.86 g during the first molt, 47.86 g during the second one, talking about the liveweight of *Cherax quadricarinatus* was 47.51 g during the first molt, 57.89 during the second one and 61.34 during the third one. The first type of crawfish had 3.4 days duration of this period whilst the second one had 3.2 days.

The anecdysis period for *Astacus astacus* was 87.8 between the first and the second molts; 278.4 days between the second and third ones, for *Cherax quadricarinatus* it was 111.6 between the first and second molts, 116.7 between the second and third ones and 145.8 days between the third and the fourth one.

Material & Methods

The research was conducted in the laboratory of aquaculture of Polissya National University. 20 mature adults of different species were selected to determine the period of molting and liveweight gain of crawfish. They were kept in separate containers with a capacity of 150 liters each. Annual spawning and molting cycles of crawfish have been studied in the laboratory for 365 days. Mature adults were kept in separate tanks, each containing four females and one male adult at a temperature of 25–27°C.

On average, female *Astacus astacus* spawn three times and molted twice a year, and *Cherax quadricarinatus* did three times. The predominant number of molts of the first type took place in June and September, and of the second one was in January as well.

The molting of crawfish begins with the preparatory stage — proecdysis (preparatory stage before the next molting). At this stage, crawfish intensively absorb calcium from feed and the environment and reabsorb calcium from the old shell.



Conclusions

It is worthwhile to say that crawfish molting occurred mainly before the breeding season. At the same time, a certain sequence between spawning and molting was observed. The most common sequence was spawning-molting-spawning as well as spawning-spawning-molting. Transitional spawning extended the time interval between molts but did not significantly affect the molt period. Liveweight during the an ecdysis was positively correlated with the size of the females while did it negatively immediately after the molting. Summing up what has been said, *Astacus astacus* had longer period between the second and the third molts than *Cherax quadricarinatus*, which resulted in fewer molts per year.