УДК 551.7/.8
ББК 26.33
О-72

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О-72 **Осадочные планетарные системы позднего палеозоя: стратиграфия, геохронология, углеводородные ресурсы** [Электронный ресурс]: сборник тезисов Международной стратиграфической конференции Головкинского 2019 (24-28 сентября 2019 г., Казань, Россия). – Электрон. сетевые данные (1 файл: 19 440 КБ). – Казань: Издательство Казанского университета, 2019. – 329 с. – Систем. требования: Adobe Acrobat Reader. – Режим доступа: http://dspace.kpfu.ru/xmlui/bitstream/handle/net/151929/golovkinsky2019.pdf. – Загл. с титул. экрана.

Международная конференция посвящена проблемам девонской, каменноугольной и пермской планетарных систем, стратиграфическим событиям, эволюции биоты, седиментационным бассейнам и полезным ископаемым.

УДК 551.7/.8
ББК 26.33

UDC 551.7/.8
LBC 26.33
L36

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L36 **Late Paleozoic Sedimentary Earth Systems: Stratigraphy, Geochronology, Petroleum Resources**: Abstract Volume of Kazan Golovkinsky Stratigraphic Meeting 2019 (September 24-28, 2019, Kazan, Russia). – Kazan: Kazan University Press. – 329 p.

The International Stratigraphic Meeting is dedicated to the Devonian, Carboniferous and Permian Earth systems, stratigraphic events, biotic evolution, sedimentary basins and resources.

UDC 551.7/.8
LBC 26.33

Breeding experiments on conchostracans as a tool for understanding fossil conchostracan biology

Elvira F. Sabirova[1,2], Veronika V. Zharinova[1], Vladimir V. Silantiev[1], Joerg W. Schneider[1,2], Frank Scholze[3] Pavel P. Prosuzhikh[1,2], Ilja Kogan[1,2]
[1]Kazan Federal University, Kazan, Russia; ElFSabirova@stud.kpfu.ru
[2]TU Bergakademie Freiberg, Freiberg, Germany
[3]Hessisches Landesmuseum Darmstadt, Darmstadt, Germany

Conchostracans are small phyllopod crustaceans with a two-valved carapace. They are known from the Devonian to present and modern species often live in small, temporary waterbodies. Their eggs can sustain extreme conditions (temperature fluctuations, habitat changes, dry seasons etc.) and survive long hostile periods by anabiosis (Scholze, Schneider, 2015). Fossil conchostracans have a high relevance for biostratigraphy of continental deposits (Kozur, Weems, 2010; Schneider, Scholze, 2018).

Studying carapace morphology of recent conchostracans (Crustacea: Spinicaudata) improves the understanding of fossil forms (Webb, 1979). We performed experiments on breeding conchostracans under laborative conditions. Conchostracans were bred in aquaria, in which modern sediments with dried conchostracan carapaces were placed (Fig. 1).

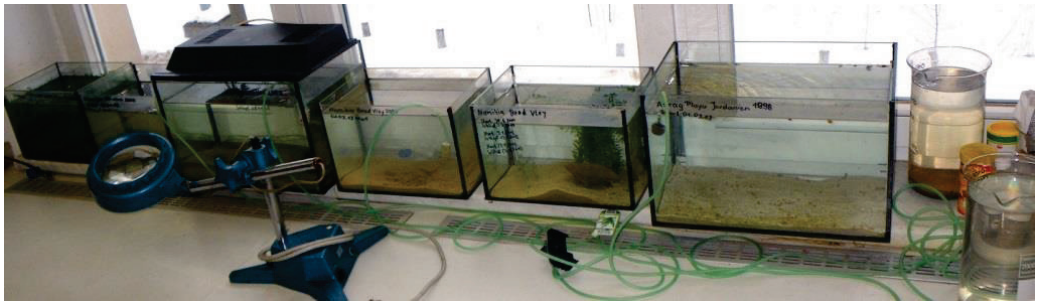

Fig. 1. Shallow water basins for breeding experiments of modern conchostracans in the Palaeontology Laboratory of the TU Bergakademie Freiberg

The material for breeding experiments belonged to the Geoscientific Collections of the TU Bergakademie Freiberg and came from present-day ponds of Königswartha (East Germany; *Limnadia lenticularis* (Linné, 1761), Fig.2A–D) as well as from modern desert sediments of Dead Vley (Namibia; Fig. 2E–G; coll. Goretzki, 2003).

A crucial precondition for conchostracan life is of course the presence of water. The investigated conchostracans lived and formed eggs in small basins of 50x30x40 cm. This implies that conchostracans can live in puddles or small ponds under shallow water conditions.

Our breeding experiments indicate the fast formation of eggs. Single eggs appear seven days after hatching of *Limnadia lenticularis*. 14 days later, an egg cluster is formed. The egg maturation takes about 3–4 weeks. After seven days, the larvae hatches.

The development of growth lines in different species corresponds to different time intervals. Among the individuals studied, new growth lines appeared after 1–3 days in the Namibian, and after 3–5 days in the Königswartha individuals. As the living conditions were equal for all conchostracans studied but the number of growth lines differed, we conclude that addition of growth lines not only depends on the living conditions, but also varies among species. The experiment has shown that the number of growth lines on the carapace cannot be used for a precise estimation of the individual age.

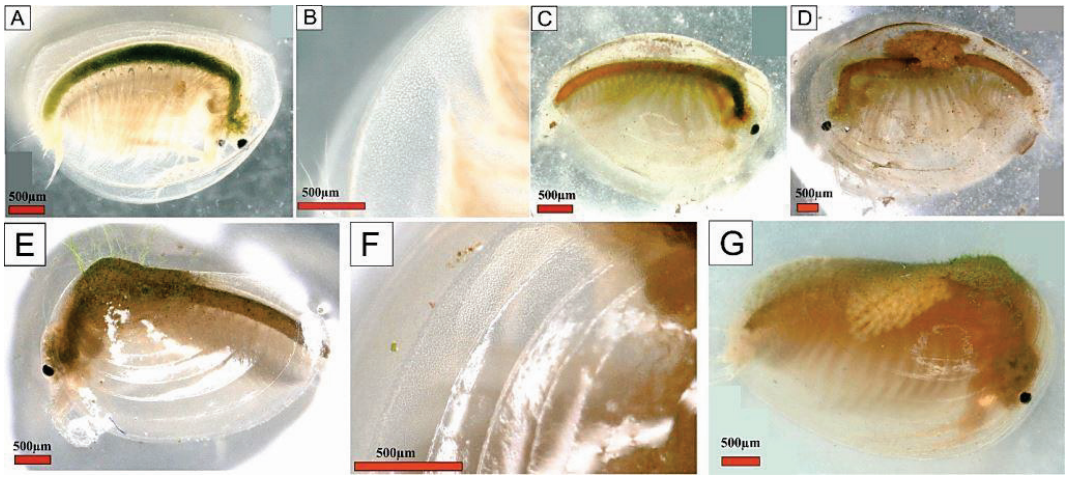

Fig. 2. Conchostracans bred under experimental conditions. A–D) *Limnadia lenticularis* (Linné, 1761) conchostracans from Königswartha: A) individual 12 days post-hatching, no growth lines on the carapace developed, no eggs produced; B) nodular (tuberculate) microsculpture on the valve 12 days post-hatching; C) individual 19 days post-hatching, one growth line developed; D) individual 23 days post-hatching, egg cluster formed, second growth line developed; E–F) conchostracans from Namibia, gen. indet.; E) individual 14 days post-hatching, seven growth lines developed; F) tuberculate microsculpture on the valve; G) individual 26 days post-hatching, formation of egg cluster

The fossil conchostracan species *Pseudestheria exigua* (Eichwald, 1860) from beds M05/06, M05/07 and M05/08 of the Monastery Ravine section (Mouraviev et al., 2015) show from 6 to 12 growth lines. One can thus assume a lifespan between 24 and 48 days for them, if every new growth line was constantly generated after 2–4 days. Newly studied individuals of *Pseudestheria novacastrensis* (Mitchell, 1927) from Permian deposits in the Babiy Kamen' section of W-Siberia exhibit 16–22 growth lines. They may have lived 32 to 88 days or even longer. On the contrary, in adult individuals the growth lines usually narrow towards the outer margins of the carapace, which we have observed in both fossil and modern conchostracan specimens. This particularly results in a set of densely spaced growth lines along the ventral margin of the adult valve, while in juvenile parts of the valve the growth lines often show wider spaces. Since the number of growth lines on a valve is governed by the total number of moulting, the observed variation in growth line density serves as indicator of variable growth rates during the individual life span. The latter does particularly account for our breeding experiments with modern conchostracans under constant environmental conditions.

Our first results demonstrate the usefulness of breeding experiments, in order to better understand both the microsculptural ornaments on the valves and the implications for the taxonomy of fossil conchostracans. Future studies should focus on a documentation of different types of ornaments, varying between areas of different growth rates within a single valve.

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