



Kazan Golovkinsky Stratigraphic Meeting

2017



Kazan Federal University
Institute of Geology and Petroleum Technologies

Kazan Golovkinsky Stratigraphic Meeting – 2017

and

Fourth All-Russian Conference “Upper Palaeozoic of Russia”

**Upper Palaeozoic Earth systems
high-precision biostratigraphy,
geochronology and petroleum resources**

Abstract Volume

19–23 September 2017, Kazan, Russia



UDC 551.736.3(470.4)
K25

Scientific editors:

Danis K. Nurgaliev,
Vladimir V. Silantiev

Technical editor

Veronika V. Zharinova

K25 **Kazan Golovkinsky Stratigraphic Meeting – 2017** and Fourth All-Russian Conference “Upper Palaeozoic of Russia”. Upper Palaeozoic Earth systems: high-precision biostratigraphy, geochronology and petroleum resources. Abstract volume. Kazan, September, 19–23, 2017 / D.K. Nurgaliev, V.V. Silantiev (Eds.). – Kazan: Kazan University Press, 2017. – 234 p.

ISBN 978-5-00019-855-1

Abstract Volume was compiled for the Kazan Golovkinsky Stratigraphic Meeting, 2017 and Fourth All-Russian Conference “Upper Palaeozoic of Russia”.

The publication was supported by the Russian Foundation for Basic Research (project no. 17-05-20511)

UDC 551.736.3(470.4)

ISBN 978-5-00019-855-1

© Kazan University Press, 2017

THE PERMIAN NON-MARINE GENUS *OPOKIELLA* PLOTNIKOV, 1949 FROM EUROPEAN RUSSIA

Milyausha N. Urazaeva

Kazan Federal University, Kazan, Republic of Tatarstan, Russia

The Permian continental basins of the East European Platform, which developed from the end of the Kungurian to the end of the Vyatkian, represented a center of diversity for the East European non-marine bivalve fauna, usually referred to as the “*Palaeomutela*-fauna” (Gusev, 1990, p. 40; Silantiev, 2015, 2016).

The root of this fauna consisted of species of the cosmopolitan genus *Palaeomutela* Amalitzky, 1892 (*Palaeomutelidae* Lahusen, 1897), which had its center of origin in the basins of the Middle Urals (Solikamsk Depression, Ufimian regional stage, Late Kungurian) (Silantiev, 2014).

The dominance of the *Palaeomutela* fauna in the non-marine basins of Eastern Europe was disrupted at the beginning of the second half of the Severodvinskian (Capitanian); a number of genera strongly differing from *Palaeomutela* in shell features appeared at this time, e.g. *Sacmariella* Kuloeva, 1967, *Verneuiliunio* Starobogatov in Betekhtina, Starobogatov et Jatsuk, 1987, and *Opokiella* Plotnikov, 1949. The genus *Verneuiliunio* and its type species *Naiadites verneuili* Amalitzky, 1892a have recently been revised (Urazaeva *et al.*, 2015). This genus, as well as the genus *Sacmariella*, can be referred to Naiaditidae Scarlato et Starobogatov, 1979 on the basis of the duplivincular ligament. The features of the hinge plate and the microstructure of the shell define the genus *Opokiella* as a separate morphological group, treated as the monogeneric family Opokiellidae Kanev, 1983.

The main difficulty in the definition of *Opokiella* lies in the confusion that arose concerning its morphological features and systematic position. Briefly this can be represented as follows:

M.A. Plotnikov (1949, p. 92) in the first diagnosis of *Opokiella*, indicated that oval-triangular shells with a sharp carina have “... a massive cardinal tooth under the umbo”. The author did not indicate the family of the genus.

E. M. Lutkevich (1960) assigned the genus *Opokiella* (with all the other Late Paleozoic non-marine bivalves) to Anthracosiidae Amalitzky, 1892a noting that “... genera with strongly different hinges are artificially combined in this family” (Lutkevich, 1960, p. 99).

H.E. Vokes (1967) assigned *Opokiella* to the Palaeomutelidae, the type genus of which is characterized by a pseudotaxodont hinge.

I.Ya. Starobogatov (1970) referred *Opokiella* (together with the genus *Palaeomutela*) to the Palaeonodontidae Modell, 1964, the type genus of which is characterized by an edentulous hinge.

A.K. Gusev (1977, 1990) placed *Opokiella* in the Anthracosiidae, indicating that this family is characterized by “... a schizodont hinge with plate-like teeth, which sometimes disappear completely or are replaced by small nodes” (Gusev, 1990, p. 156), and that the genus *Opokiella* has a “... schizodont hinge, the details of which are not completely revealed” (Gusev, 1990, p. 196).

O.A. Scarlato and I.Ya. Starobogatov (1979, p. 28), conditionally following O.A. Betekhtina (1974), included *Opokiella* in the Kinerkaellidae Scarlato et Starobogatov, 1979, the type genus of which *Kinerkaella* Khalfin, 1950 has an edentulous hinge.

G.P. Kanev (1983, p. 23) defined a new family Opokiellidae Kanev, 1983 giving the following diagnosis: “Shell oval-triangular, thick-walled, equilateral, with carina rounded. Umbo high, located close to middle of dorsal margin. Schizodont hinge with lamellar tooth, ligament external. Composition: *Opokiella* Plotnikov, 1949, *Sacmariella* Kuloeva, 1967”.

The revision of *Opokiella* is relevant for two reasons. Firstly, it is established that *Opokiella* species of different ages possess somewhat different hinges. This difference may form the basis for a phylogenetic scheme of *Opokiella*, and can be used for the development of a zonal scheme.

Secondly, on the basis of external signs, the genus *Opokiella* is close to the non-marine bivalves described by L.R. Cox (1936) under the provisional name “*Carbonicola*”, from the Upper Permian (Lopingian) of Tanzania.

This may indicate a bipolar distribution for *Opokiella*, which is not uncommon in Permian non-marine bivalves. In particular, *Palaeomutela* Amalitzky, 1892 and *Palaeonodonta* Amalitzky, 1895 are characterized by a bipolar distribution (Silantiev, Urazaeva, 2013; Silantiev, Carter, 2015) as well as some Angaridian genera (Silantiev *et al.*, 2015).

This study was partly supported by the Russian Foundation for Basic Research (project no. 16-04-01062).

- Cox, L.R. (1936): Karoo Lamellibranchia from Tanganyika Territory and Madagascar. *J. Geol. Soc. London*. 92(1):32–54.
- Gusev, A.K. (1977): Stratigraphic significance of nonmarine bivalves of the Upper Permian of the European part of the USSR (Stratigraphic significance of non-marine bivalves in the Upper Permian of the European part of the USSR). In: *Materialy po stratigrafii verkhnei permi na territorii SSSR*. Kazan: Izd. Kazan. Gos. Univ., pp. 94–128.
- Gusev, A.K. (1990): *Nemorskie dvustvorchatye mollyuski verkhnei permi Evropeiskoi chasti SSSR (Non-marine Bivalve Mollusks from the Upper Permian of the European Part of the USSR)*. Kazan: Izd. Kazan. Gos. Univ., pp. 1–295.
- Kanev, G.P. (1983): Sistematika permskikh nemorskikh dvustvorchatykh mollyuskov v paione evropeiskogo severa SSSR (The systematics of Permian non-marine bivalves in the European north of the USSR). *Tr. Inst. Geol. Akad. Nauk SSSR, Komi Filial*, 44:22–23.
- Lutkevich, E.M. (1960): Order Schizodonta. In: *Osnovy paleologii. Mollusca–Polyplacophora, Bivalvia, Scaphopoda*. Moscow: Izd. Akad. Nauk SSSR, pp. 93–102.
- Plotnikov, M.A. (1949): New data on fauna of the Tatarian Stage in the basins of the Sukhona and Malaya Northern Dvina rivers. *Ezheg. Vsesoyuz. Paleontol. Ob–va*, 13:91–98.
- Scarlato, O.A. & Starobogatov, Y.I. (1979): General evolutionary patterns and the system of the Class Bivalvia. In: *Morphology, Systematics and Phylogeny of Molluscs. Trudy Zool. Inst.*, 80:5–39.
- Silantiev, V.V. & Carter, J.G. (2011): On Changes in Taxonomy of Nonmarine Bivalve Mollusks of the Late Paleozoic in the New Edition of “*Treatise on Invertebrate Paleontology*”. *Byull. Mosk. Ob–va Ispyt. Prir., Otd. Geol.*, 86 (1): 14–17.
- Silantiev, V.V. & Urazaeva M.N. (2013): Shell Microstructure in the Permian Nonmarine Bivalve *Palaeomutela* Amalitzky: Revision of the Generic Diagnosis. *Paleontological Journal*, 47(2): 139–146.
- Silantiev, V.V. (2014): Permian nonmarine bivalve zonation of the East European Platform. *Stratigr. Geol. Korrelyatsiya*, 22 (1): 1–27.
- Silantiev, V.V. (2015): Evolution of Permian nonmarine bivalve fauna in East European Platform. *Byull. Mosk. Ob–va Ispyt. Prir., Otd. Geol.*, 90(6):48–57.
- Silantiev V.V., Chandra, S. & Urazaeva, M.N. (2015): Systematics of Nonmarine Bivalve Mollusks from the Indian Gondwana Coal Measures (Damuda Group, Permian, India). *Paleontol. J.* 49(12):1235–1274.
- Silantiev, V.V. (2016): Permian non-marine bivalves of the East European Platform: stratigraphic distribution and correlation. *Byull. Mosk. Ob–va Ispyt. Prir., Otd. Geol.* 91(1):50–66.
- Vokes, H.E. (1967): Genera of the Bivalvia: A systematic and bibliographic catalogue // *Bull. Am. Paleontol.*, 51(322):111–594.
- Urazaeva, M.N., Silantiev, V.V. & Usmanova, R.R. (2015): Revision of Late Permian Nonmarine Bivalves of the Genus *Verneuilunio* Starobogatov, 1987 and Its Type Species *Naiadites verneulli* Amalitzky, 1892. *Paleontological Journal*, 49(11):1174–1183.