

Calpichitina (Calpichitina) acollaris (Eisenack, 1959) from the Silurian (Wenlock) of the Moesian Platform, NE Bulgaria

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Искра Лакова — *Calpichitina (Calpichitina) acollaris* (Eisenack, 1959) от уенлокската серия на силура в Мизийската платформа в СИ България.

Опорно-параметричният сондаж ОП-2 Михалич в СИ България пресича Варовито-теригенно-глиневата задруга (ВТГЗ), чиято възраст е старопалеозойска (ордовик? — долен девон). В няколко ядрови интервала при забоя на ОП-2 Михалич във ВТГЗ беше установен *Calpichitina (Calpichitina) acollaris* (Eisenack). Този хитинозоен вид е характерен за средната част на уенлокската серия. Така най-долната част на ВТГЗ, разкрита в този сондажен разрез между дълбочини 3343 m и 3761 m (забой) и съдържаща *C. (C.) acollaris*, се отнася към уенлока. Видът е описан систематично, като е използвана морфологична информация, получена чрез сканиращ електронен микроскоп.

Introduction and Stratigraphic Notes

The Lower Paleozoic (Ordovician? to Lower Devonian) Calcareous-Terrigenous-Argillaceous Series (CTAS) from the subsurface of the Moesian Platform in Northeast Bulgaria is more than 1000 m thick and contains very scarce macrofossils; its age determination is difficult. Among the wells to crosscut the CTAS only two — the R-2 Vetrino and the OP-2 Mihalich (Fig. 1A) reached its lower part referred to the Silurian. Fossils have been found so far at separate levels of the CTAS in the R-2 Vetrino borehole section — *Llandovery* graptolites between depths of 2840 m and 2849 m and Wenlock condonts at depth of 2663 m (Спасов, Янев, 1966).

The whole lithological sequence of the CTAS in the OP-2 Mihalich well has been described in detail and Uppermost Silurian to Lower Devonian chitinozoans have been recorded from the upper part of the CTAS between depths of 2735 m and 3158 m (Lakova, Yaney, 1989).

The lower part of the CTAS below 3158 m downward to the borehole bottom at 3761 m is much poorer in palynofossils. An exception is the presence of *Calpichitina (Calpichitina) acollaris* (Eisenack). The occurrence of that chitinozoans species in the OP-2 Mihalich section is shown of Fig. 1B. Its range worldwide is restricted at a short time interval in the middle part of the Wenlock, i. e. the Upper Sheinwoodian and Lower Homerian. Thus, the record of *C. (C.) acollaris* from the lower part of the CTAS in the OP-2 Mihalich section between depths of 3343 m and 3761 m suggests a Wenlock age. *C. (C.) acollaris* is the oldest chitinozoa known so far in the Moesian Platform from the subsurface of North Bulgaria. The study interval consists of dark grey to black hard siltstones.

The geographic range of *C. (C.) acollaris* covers the Baltic region only — England, Estonia and Sweden; it is not known from the North Gondwana. Cramer (1967, 1973), however, reported "*Hoegisphaera acollarae* (Eisenack, 1959)" from the Silurian of Spain (Cantabrian Mountains) and the U. S. A. (Florida) but it is not easy to estimate from the photos if the specimens figured belong to that species.

Along with *C. (C.) acollaris* and other undeterminable chitinozoans, badly preserved acritarchs and trilete spores also occur. That palynomorph assemblage of low diversity containing plant elements indicates deep marine environment not very far from the land.

The palynofossils are dark grey to black in colour, flattened, part of them are destroyed. The TAI index visually evaluated from the spore colour is about 4 (Staplin, 1969) and suggests a high-temperature maturation.

Systematic part

Group *CHITINOZOA*

Order *OPERCULATIFERA* Eisenack, 1972

FAMILY DESMOCHITINIDAE EISENACK, 1931 EMEND.

SUBFAMILY DESMOCHITININAE PARIS, 1981

Genus *Calpichitina* Wilson & Hedlund, 1964

Type species (fixed by original designation): *C. scabiosa* Wilson & Hedlund, 1964.

Subgenus *Calpichitina (Calpichitina)* Paris, 1981

Type species (fixed by original designation): *C. scabiosa* Wilson & Hedlund, 1964.

Calpichitina differs from the other genera belonging to the subfamily Desmochitinae (*Desmochitina*, *Bursachitina* and *Bulbochitina*) in having lenticular to subspherical body chamber. Paris (1981, pp. 127, 131) has divided *Calpichitina* into two subgenera to distinguish the group of species lacking a basal callus or any differentiation of the aboral pole — subgenus *C. (Calpichitina)*, from another group providing with a basal callus adhering tightly to the operculum of the next vesicle and thus forming solid chains — subgenus *C. (Densichitina)*.

Calpichitina (Calpichitina) acollaris (Eisenack, 1959)

Pl. I, figs. 1—7

1959 *Desmochitina? acollarae* n. sp.; Eisenack, p. 16-17, pl. 3, fig. 14.

1968 *Desmochitina acollaris* Eisenack, 1959; Eisenack, p. 182.

1974 *Desmochitina acollaris* Eisenack, 1959; Laufeld, p. 75-77, Fig. 38 A-D.

1981 *Desmo. acollaris*; Dorning, p. 206, Table 1, No 11.

1982 *Desmochitina acollaris* Eisenack; Hecrop, pl. 15, fig. 3.

1989 *C. (Calpichitina) acollaris*; Paris, p. 281, Fig. 174, No. 20.

1990 *Desmochitina acollaris* Eisenack; Nestor, pl. 14, fig. 24.

Type. Holotype is the specimen figured by Eisenack (1959, pl. 3, fig. 14) from the Silurian, Wenlock of Gotland (Sweden).

Material and occurrence: 18 flattened opaque specimens from the Calcareous-Terrigenous-Argillaceous Series, OP-2 Mihalich well between depths of 3343m and 3761 m, NE Bulgaria; Silurian, Wenlock.

Description. The vesicle is lenticular, thin-walled. The aperture is large, with a fine smooth rim and without a collar. The aperture diameter is twice smaller than the overall diameter. A thin operculum is seen, sometimes sunk below the aperture rim (pl. I, fig. 4). The aboral pole lacks a basal callus (pl. I, fig. 5). The surface is sculptured by a dozen of well developed parallel wave ridges of positive relief passing perpendicularly to the longitudinal axis. These ridges disappear towards the poles. No chains have been found because the attachment between neighbouring vesicles is not tight.

Dimensions. The visible diameter measured at flattened specimens ranges from 74 to 80 μm but the real diameter is a little smaller. The aperture diameter reaches up to 37 μm .

Remarks. *C. (c.) acollaris* from the OP-2 Mihalich well is similar to the holotype in overall shape and size. Laufeld's (1974) excellent SEM illustrations of "*D. acollaris*" from Gotland show identical surface ornamentation with that observed in the present study. The lenticular body chamber as well as the absence of collar or carina give grounds for accepting the transfer of *D. acollaris* to the subgenus *Calpichitina* (*Calpichitina*) as proposed by Paris (1989).

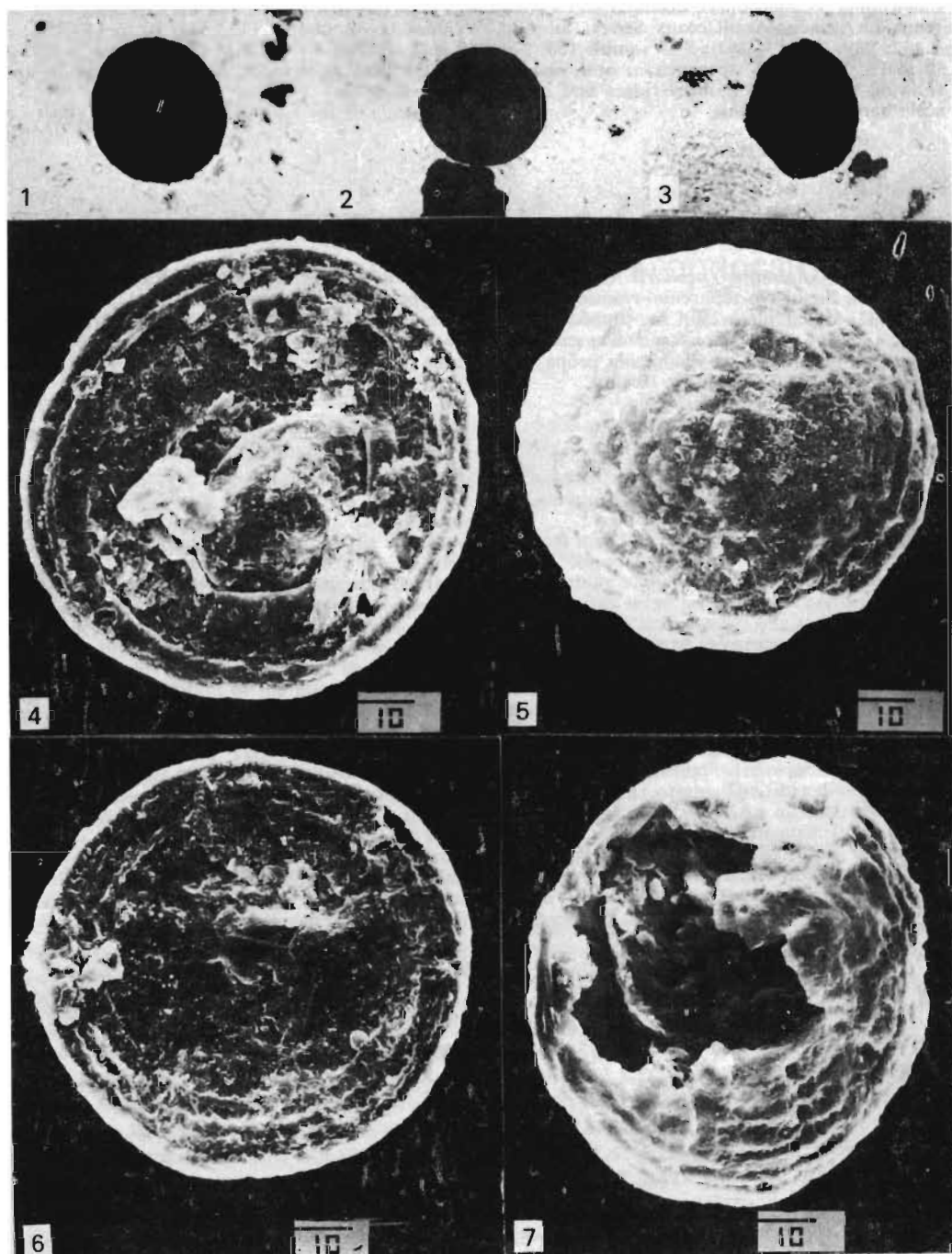
Known stratigraphic and geographic range. *C. (Calpichitina) acollaris* is a characteristic fossil of the middle part of the Wenlock. It has been reported from the middle part of the Wenlock (Högkint, Tofta and Silte Formations) in Gotland, Sweden by Laufeld, 1974; from the middle Wenlock (Jaani and Jaagaruhi Formations) in Estonia by Nestor, 1990; from the middle Wenlock (Buildwas, Coalbrookdale and Much Wenlock Limestone Formations) in England by Dornin, 1981. Paris (1989, p. 281) summarized the data available and stated that *C. (C.) acollaris* is restricted to the upper part of the Lower Wenlock (Sheinwoodian).

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Сп. на Българското геологическо д-во, кн. 3
 Iskra Lakova — *Calpichitina (Calpichitina) acollaris* (Eisenack, 1959) from the Silurian
 (Wenlock) of the Moesian Platform, NE Bulgaria.

PLATE I

1-7. *Calpichitina (Calpichitina) acollaris* (Eisenack, 1959). All specimens from the OP-2 Mihalich well, Calcareous-Terrigenous-Argillaceous Series; Silurian, Wenlock. 1 — sample 115; 3347,10 m ($\times 250$); 2 — sample 132; 3599,0 m ($\times 250$); 3 — sample 158; 3758,10 m ($\times 250$); 4-7 — SEM photos from sample 147; 3696,50 m ($\times 850$): 4 — specimen in oral view showing the sunk operculum; 5-7 — specimens in aboral view showing sculpture of parallel ridges and absence of basal callus (The scale bars equal 10 μm)

ТАБЛИЦА I

1-7. *Calpichitina (Calpichitina) acollaris* (Eisenack, 1959). Всички екземпляри са от сондажния разрез ОП-2 Михалич, Варовито-теригенно-глинеата задруга; силур, уенлок. 1 — проба 115; 3347,10 м ($\times 250$); 2 — проба 132; 3599,0 м ($\times 250$); 3 — проба 158; 3758,10 м ($\times 250$); 4-7 — снимки със СЕМ от проба 147; 3696,50 м ($\times 850$): 4 — орален изглед на екземпляр с потънал оперкулум; 5-7 — екземпляри в аборален изглед, показващ скулптура от успоредни ребра и отсъствие на мукрон (Мащабната линейка е равна на 10 μm)