

## Morphological differentiation of loricas of *Calpionella alpina* and its significance for the J/K boundary interpretation

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Calpionellids are typical late Tithonian and Early Cretaceous microfossils with a significant biostratigraphic significance and *Calpionella alpina* constitutes one of the most important species. It reveals a large diversity of the largeness and proportions of lorica, which can be observed within time as well as in co-occurring assemblages. Recent studies done by Berriasian Working Group shown its potential to offer the marker for J/K boundary limit. Changes in morphological parameters of *C. alpina* loricas along the J/K boundary interval previously declared by NOWAK (1971), BORZA (1984), REMANE (1986) and later verified numerically by LAKOVA (1994) were observed practically by all specialists studied the calpionellid succession in this time interval. Biometrical analysis done from the exotic limestone pebbles of the Polish Outer Carpathians by KOWAL-KASPRZYK (2014) and the recent studies running in some of published Tethyan sections (Brodno and Strapkova sections situated in Pieniny Klippen Belt of the Slovak Western Carpathians and Le Chouet, Drôme sections situated in Vocontian trough (SE France) proved older observations statistically.

In the late Tithonian Crassicollaria Zone *C. alpina* is strongly diversified morphologically – in both largeness (predominantly 55–95 µm) and ellipticity (predominantly 0.8–1.4). The boundary of the Crassicollaria/Calpionella zones can be defined by the onset of *C. alpina* event which is characterized by decline of large, elongated specimens of *C. alpina* (=“*C. grandalpina*” Nagy), disappearance of the homeomorph of *C. elliptica* (=“*C. elliptalpina*” Nagy), the last occurrence of *Crassicollaria brevis* and *Crassicollaria massutiniana* and increase in the relative abundance of small to medium-sized, spherical species of *C. alpina* (largeness predominantly 55–75 µm, ellipticity predominantly 0.8–1.15). Changes in morphological parameters of *C. alpina* loricas along the J/K boundary interval could reflect change of environmental condition prior to sea level fall, increase of water temperature and salinity.

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