

Calcareous nannofossils from the Triassic/Jurassic boundary in the Northern Calcareous Alps (Austria)

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We have studied the latest Rhaetian-earliest Hettangian transition in a composite section, belonging to the Dürrnberg Formation and well-dated with ammonites, of the Hallstatt-Zlambach Basin (Northern Calcareous Alps, Austria), located in the Euroboreal outer shelf transitional to the Tethys Ocean. The first occurrence of the ammonite *Psiloceras spelae tirolicum* supports the position of the Triassic/Jurassic (T/J) boundary (Hillebrandt et al., 2013). Below this subspecies was found *P. spelae* n. ssp., a new subspecies of *P. spelae*, which can be considered as a Triassic forerunner of *P. spelae tirolicum*. Foraminifera (Hillebrandt), ostracods (Urlichs) and calcareous nannofossils (Fraguas) have also been investigated, and these micro- and nannofaunas are more diverse and abundant in the studied area than in the Eiberg Basin (Hillebrandt et al., 2013), situated further northwest. In terms of calcareous nannofossils, the NJT1 Schizosphaerella punctulata Zone of Bown & Cooper (1998) has been identified. The marker species, *S. punctulata*, which defines the base of this zone, is present from the lowermost sample studied to the top of the composite section. Considering the precise calibration to ammonite zones, probably its first occurrence took place below the T/J boundary in the studied area. Two nannofossil events, the last occurrences of *Prinsiosphaera triassica* and *Eoconusphaera zlambachensis* could help to constrain the T/J boundary. Some relevant changes in nannofossil assemblages have also been observed around this boundary: the switch in dominance from *P. triassica* to calcispheres and *S. punctulata*, as Hillebrandt et al. (2013) detected in the Eiberg Basin, or the size reduction of the calcispheres and *P. triassica*, and the disappearance of other scarce Triassic nannofossils, such as *Tetralithus cassianus* and *Hayococcus floralis*, as Bottini et al. (2016) described in the Italian Alps. Probably, calcareous nannofossils were affected by the calcification crisis linked to the paleoenvironment perturbations recorded during this time interval, marked by a major mass extinction recorded in different fossil groups all around the world

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Bottini C., Jadoul F., Rigo M., Zaffani M., Artoni C. & Erba E. (2016) - Calcareous nannofossils at the Triassic/Jurassic boundary: stratigraphic and paleoceanographic characterization. Riv. Ital. Paleontol. S., 122, 141-164.

Bown P.R. & Cooper M.K.E. (1998) - Jurassic. In: Bown, P.R. Ed., Calcareous Nannofossil Biostratigraphy, 86-131. Kluwer Academic Publishers, London.

Hillebrandt A.V., Krystyn L., Kürschner W.M., Bonis N.R., Ruhl M., Richoz S., Schobben M. A. N., Urlichs M., Bown P.R., Kment K., McRoberts C.A., Simms M. & Tomášových A. (2013) - The Global Stratotype Sections and Point (GSSP) for the base of the Jurassic System at Kuhjoch (Karwendel Mountains, Northern Calcareous Alps, Tyrol, Austria). Episodes, 36, 142-198.