

Integrated Biostratigraphy of the Tithonian-Valanginian succession from the Northwest Anatolia, Turkey

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The analysis of Tithonian–Valanginian calcareous nannofossils and calpionellids have been investigated in order to improve the biostratigraphic resolution of this interval from the Northwest Anatolia, Turkey. The studied sections have been measured from the Tithonian–Valanginian deposits of the Yosunlukbayırı Formation and the Soğukçam Limestone. These formations are mainly characterised by calciturbidities and micritic limestones and marls with cherty and shaly levels.

Because of rareness and difficulties in extracting calcareous nannofossil species from these type of lithologies, nannoconids, the principal rock-forming constituent of the Soğukçam Limestone, have been analysed from the very thin-thin sections. Nannofossil assemblages are dominated by *Conusphaera* spp., *Faviconus multicolumnatus*, *Watznaueria* spp. and *Nannoconus* spp. Five zones (*Conusphaera mexicana mexicana* Zone, *Microstaurus chiastius* Zone, *Nannoconus steinmannii steinmannii* Zone, *Retecapsa angustiforata* Zone, *Calcicalathina oblongata* Zone) were recognized from Tithonian to Valanginian.

Successive distributions of calpionellids within the studied interval are evaluated to establish the biostratigraphic framework. Calpionellid zonation from bottom to top consists of *Chitinoidella boneti* Zone, *Praetintinnopsella* sp. Zone, *Crassicolaria* sp. Subzone, *Cr. intermedia* Subzone, *Cr. brevis* Subzone, *Calpionella alpina acme* Subzone, *Remaniella ferasini* Subzone, *Calpionella elliptica* Subzone, *Calpionellopsis simplex* Subzone, *Cs. oblonga* Subzone, *Lorenziella hungarica* Subzone, *Calpionellites darderi* Zone, *Tintinnopsella carpathica* Zone.

The co-occurrence of calpionellid and nannofossil events along the J/K boundary transition is typical as observed in other Tethyan sections. The Jurassic-Cretaceous boundary has been located at the base of *Calpionella alpina acme* zone. The acme of *C. alpina* is nearly synchronous with the last occurrence (LO) of *C. ellipticalpina* and perfectly fits with LOs of some Late Tithonian *Crassicolaria* species including *C. intermedia* and *C. massutiana*. The Jurassic-Cretaceous boundary based on the calpionellids corresponds to the middle part of the *M. chiastius* Zone of nannofossils. Among nannoconids, one of the oldest species, *N. globulus minor* appears in the very Late Tithonian, close to the J/K boundary.