

Radiolarian biostratigraphy of middle-upper Jurassic pelagic siliceous successions of western Sicily and the Southern Alps (Italy)

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A rich radiolarian fauna of Middle-Late Jurassic age has been recovered from pelagic siliceous successions in Western Sicily and the Southern Alps (Italy). The crucial complement to this research in the occurrence of ammonites in the same stratigraphical sections: such occurrence allows a good calibration of the radiolarian biozones. This paper represents the PhD research of the author.

In Western Sicily six stratigraphical sections have been described and sampled: Fornazzo Strada, Fornazzo Cava, Castello Inici, Balata di Baida, Favignana (all belonging to Trapanese Plateau), and Sant'Anna (Sicano Basin). In the Southern Alps two stratigraphical sections have been described and sampled (Cava Vianini and Ceniga), and the previously studied radiolarian assemblages of the Coston delle Vette section have been added for the biostratigraphical analysis. The three Alpine sections belong to Trento Plateau. Most successions represent the intermediate pelagic siliceous member (Rosso Ammonitico Medio coded as RAM) of the Rosso Ammonitico Fm. Except at Sant'Anna and Coston delle Vette localities. The time-equivalent facies of the Rosso Ammonitico Medio is a basinal succession at Sant'Anna and the Fonzaso Fm. at Coston delle Vette. The radiolarian assemblages of the following sections have been studied for the first time: Fornazzo Strada, Fornazzo Cava, Castello Inici, Balata di Baida, Favignana and Cava Vianini. The radiolarian preservation is generally moderate and it is very good in some samples.

A new regional radiolarian zonation for the Middle-Late Jurassic is presented in this paper. The biochronology has been carried out by means of Unitary Associations method and the software BioGraph. The stratigraphical distribution of 99 taxa in 67 samples from 9 sections constitutes the database for the definition of 16 Unitary Associations, which have been afterwards grouped in 6 Unitary Association Zones (UAZ-SA). The UAZones range as follows: UAZ A (?early-middle Bath. to early Call. pars), UAZ B (early Call. pars-early Oxf.), UAZ C (middle Oxf.), UAZ D (?middle-?late Oxf.), UAZ E (?late Oxf.-early Kimm. pars), UAZ F (early Kimm. pars-late Klmm.). These biozones are tied to chronostratigraphy by means of the ammonites found in the studied successions and in the under- and overlying sediments. The stratigraphical correlation of the Sicilian and Alpine sections through the UAZ-SA reveals a significant diachronism for the lower as well as for the upper boundary of the Middle-Upper Jurassic pelagic siliceous facies both between Western Sicily and the Southern Alps, and within the same paleogeographical domain.

The new zonation by UAZ-SA has been compared with the zonation by UAZ95 of Baumgartner et al. (1995a) in order to discuss a tentative recalibration of some UAZ95 through the ammonites found in the studied sections.

By means of the UAZ-SA it has also been discussed the chronostratigraphical assignment of the Ceniga and Sant'Anna sections in comparison to the previous authors. The Ceniga section (Trento Plateau, Southern Alps) is now referred to ?middle Oxfordian-early Kimmeridgian pars (UAZ-SA D-E). The Sant'Anna section (Sicano Basin , Western Sicily) is now assigned to ?late Oxfordian-late Kimmeridgian (UAZ-SA E-F). Furthermore, for some taxa (such as *Podocapsa amphitrepta* Foreman, *Tetratras bulbosa* Baumgartner,

Tetratrabs zealis (Ozvodova) and *Acanthocircus trizonalis diacranacanthus* (Squinabol), emend. Foreman) are suggested different ranges with respect to those stated in Baumgartner et al. 1995.

Concerning the systematics, 7 new species of radiolarian (4 Nassellaria and 3 Spumellaria) have been discovered in the studied sections, and already described in separate papers. The main feature of most radiolarian assemblages is the extraordinary abundance of Syringocapsids (Nassellaria). Sponge spicules are also abundant and well diversified in most samples: such assemblages are typical of proximal or relatively shallow water environments.

The radiolarian zonation by UAZ-SA undoubtedly contributes to the Jurassic biozonation. The high resolution sampling of sections that crop out in a restricted geographical area results in more Unitary Associations and better defined UAZzones. The radiolarian data of this research will increase the database of the INTERRAD Jurassic-Cretaceous Working Group and will contribute to create new better-defined radiolarian biozones for the Jurassic Mediterranean Tethys.