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Conodont zonation for the Lower Triassic of western Tethys - a case study from Slovenia

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Slovenia is situated in the area of four major geotectonic units: the Southern Alps, the Eastern Alps, the Dinarides, and the Pannonian Basin. Today's geological construction of Slovenia is largely a result of the collision of the Adriatic and European plates and the accompanying tectonic processes which persist even yet today. All of the tectonic units of the Slovenian territory belong to the Adriatic lithosphere plate, which was originally connected to the African plate, and has existed as a separate plate from the Mesozoic Era to the present. For conodont study, Lower Triassic marine sedimentary rocks in the area of the Southern and Eastern Alps, the External Dinarides and the Transitional area between the External and Internal Dinarides were sampled. The lithostratigraphic development of Lower Triassic strata in all of the studied geotectonic units in Slovenia is more or less similar. The base of the Lower Triassic strata is composed of the Bellerophon Formation which was the result of a general marine transgression onto a shallow shelf of western Paleotethys in the Late Permian. The Permian-Triassic boundary (PTB) interval containing conodonts is preserved only in the Idrija-Žiri area of the External Dinarides. Olenekian conodonts were identified in all units, except in the Slovenian part of the Eastern Alps.

Despite lithological variations among the different Lower Triassic sedimentary areas in the External Dinarides, the transitional area between the External and Internal Dinarides, and their threefold division can be divided into: an oldest part consisting of carbonate, a middle siliciclastic or mixed siliciclastic-carbonate part, and a youngest carbonate part.

Following conodont zones have been distinguished in the studied geotectonic units of Slovenia: *Hindeodus praeparvus* Z., *H. parvus* Z., *Isarcicella lobata* Z., *I. staeschei* – *I. isarcica* Z., *H. postparvus* Z., *Hadrodontina aequabilis* Z., *Ha. anceps* Z., *Eurygnathodus costatus* Z., *Neospathodus planus* Z., *N. robustus* Z., *Platyvillosus corniger* Z., *Pl. regularis* Z., *Pachycladina obliqua* Z., *Foliella gardeane* Z., *Triassospathodus hungaricus* Z., *T. symmetricus* Z., *N. robustispinus* - *T. homeri* Z. and *T. triangularis* Z. The introduced conodont zonation of the Lower Triassic for Slovenia can be applied also for the shallow shelf environments of western Tethys.

The Lukač section near Žiri in the External Dinarides represents a key section to define the PTB interval strata in Slovenia due to the presence of the conodont species *H. parvus* which is used as a marker according to an international criterion of the IUGS. Therefore it is taken also as a standard for conodont zonation for the entire Dinarid area. The PTB interval in Slovenia is characterized by the genera *Hindeodus* and *Isarcicella*, and the absence of gondolellids is obvious. Therefore, the conodont zonation for the shallow facies of the Meishan section in China and later refined for the Dolomites in Italy can be applied.

Certain Lower Triassic faunas in Slovenia show a very low diversity marked by shallow water and/or euryhaline genera. Due to the obvious absence of worldwide zonal markers, the stratigraphic use of those taxa was applied in Slovenia that are an important regional biostratigraphic tool in western Tethys. Most recovered conodont faunas from Slovenia markedly differ from the contemporaneous conodont faunas of North America and Asia. A limited geographic distribution of some taxa confined to

the European sections (*Foliella*, *Platyvillosus*) suggests that they were ecologically restricted and probably adapted to shallow water environments. *T. hungaricus* is the species present quite frequently in western Tethys where it occurs as single conodont species (Kolar-Jurkovšek & Jurkovšek, 2015). Representatives of the *T. symmetricus* – *homeri* - *triangularis* lineage are well documented and quite common worldwide.

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