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Significance of Platyvilosus costatus and Foliella gardenae as indicators for the Dienerian-Smithian and Smithian-Spathian boundaries, respectively: a study in the Dolomites (N-Italy)

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The Early Triassic is a very peculiar period in Earth history, as it represents the time after the worst mass extinction event. Therefore it is of great interest and importance to correlate in time slices findings in various Early Triassic sections to combine the archived processes and evolutions in different regions. However, correlation often is hampered by absence or scarcity of time-diagnostic (macro-) fossils. The Early Triassic carbon isotope curve is a very valuable tool for stratigraphic correlation, but there are regionally significant variations in the curve shape for some Early Triassic intervals and thus additional markers are needed. Conodonts have proven to be suitable, when available in the Early Triassic sediments, however for the Dolomites the fauna has been documented to be rather poor. In our new study, sampling has been carried out in higher resolution and demonstrates that aside from the genera Hadrodontina and Pachycladina also two other forms occur in two short periods across the Dienerian-Smithian (DSB) and Smithian-Spathian (SSB) boundaries. Tightly embracing the DSB occurs Platyvillosus costatus and closely below the SSB Folliella gardenae is present. As these two conodonts have a geographically very wide occurrence and only existed over a short time period they are perfect indicators for these substage boundaries. Furthermore, in the Dolomites they mark short intervals of open-marine influence in this shallow realm. Additionally, it also shows that certain lithofacies in the Dolomites and Dinarides can be correlated between different sections and regions and are demonstrated to occur synchronously.