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# The Prosanto Formation, a marine Middle Triassic Fossil-Lagerstätte near Davos (Canton Graubünden, Eastern Swiss Alps)

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*Key words:* Taphonomy, Fossil-Lagerstätte, Middle Triassic, Prosanto Formation, Graubünden, Eastern Swiss Alps, Austroalpine Silvretta Nappe

## Introduction

During the last 15 years, more than 1000 small but well-preserved actinopterygian fishes, a few sauropterygian reptiles and some crustaceans, bivalves, gastropods, dasycladacean algae and terrestrial plants have been collected from the Ladinian (Middle Triassic) Prosanto Formation in the Duncan and Landwasser region near Davos (Canton Graubünden, Eastern Swiss Alps). The sequence of dark limestone, shale and dolomite of the Prosanto Formation occurs as a 100 to 200 m thick and more than 20 km wide lenticular intercalation in shallow water dolomites (Vallatscha and Altein Formations) of the strongly deformed sediments of the Austroalpine Silvretta Nappe. A joint paper on the geology, stratigraphy, paleoecology and the fossils was published by Bürgin et al. (1991). As most of these fossils were collected in the scree, small excavations have been organized in 1992 and 1993 in an alpine locality at 2600 m altitude near Davos to obtain more information about the taphonomy of the fossils and their distribution within the layers. Fossiliferous beds of 2.5 m thickness were studied in detail on a surface of 20 square meters, yielding about 500 complete or fragmentary fossils.

## Taphonomy, paleoecology and paleogeography

Articulated skeletons of actinopterygian fishes, aquatic reptiles, crustaceans and twigs of conifers have been preserved only in finely laminated limestone and shale beds without any bioturbation. There are no signs of current activity in these background sediments, such as orientation of skeletons or unidirectional drifting of finer skeletal elements. Some fragmentary fish skeletons and many isolated skulls, jaws, teeth and scales suggest a slow settling of the carcasses through the water column. Slumps, breccias and frequent calcareous turbidites, often rich in siliceous sponge spicules, ostracods and benthic foraminifers, document the instability of the basin margins. A few beds with trace fossils (*Thalassinoides* and *Rhizocorallium*) document short events of bottom population by deposit

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(*Araucarioxylon*) and the terrestrial protorosaur *Macrocnemus*. The rarity of stenohaline organisms, such as cephalopods and echinoderms, indicate a restricted environment. The only connection to the open sea probably existed over areas of the shallow carbonate platform. Intense evaporation possibly led to increased salinity and formation of a pycnocline by concentration of the dense brine in the deeper parts of the restricted basin. Stagnant hypersaline bottom water and depletion of oxygen by decaying organic matter could explain the abiotic environment.

The Prosanto Formation of Graubünden can be compared to the Lower Meride Limestone of the Monte San Giorgio area in Canton Ticino (Southern Switzerland, Furrer 1995, this volume) and the Perledo-Varenna Formation (Northern Italy, Gaetani et al. 1992), both time equivalent restricted basinal facies in the Southern Alps. These formations were deposited in similar intraplateau basins separated by shallow carbonate platforms from the open ocean of the Triassic Tethys.

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