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## A unique lacustrine record of the Alpine Lateglacial and the Lateglacial-Holocene transition from the centre of the Eastern Alps (Austria)

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### Abstract

The reconstruction of the Alpine Lateglacial is in general based either on the succession of end moraines or on lacustrine and peat deposits. Palynologically investigated records consisting of lacustrine and glacial deposits from sites close to modern glaciers are missing so far.

The sediment sequence of Lake Stappitzer See in the Seebach Valley (Mallnitz, Carinthia) is filling this gap. It is located in the still glaciated Hohen Tauern mountain range surrounded by peaks of 3000 metres altitude. End moraines of the Little Ice Age and the Egesen stadial (Younger Dryas, 12.8-11.7 ka) are present in and close to the cirques. However, evidence of a valley glacier during the Gschnitz stadial (<sup>10</sup>Be exposure age 16.6±1.4 ka, Ivy-Ochs et al. 2006) is missing in this valley. This is in sharp contrast, to neighbouring valleys where Gschnitz end moraines are well developed. The deposits of the Auernig rock avalanche occur c. 6 km downstream of the drill site. Based on U/Th isochrones dating, the catastrophic slope failure happened at 17.5±1.4 ka. Terraces and delta deposits just upstream of the rock avalanche deposits indicate the formation of a large lake dammed by the landslide.

In 2001, Fritz & Ucik published a comprehensive study on the chronology of climatic and vegetation change of the Seebach Valley. Their interpretation of the lacustrine record of two drill cores is in some issues in contradiction to the scientific consensus. On occasion of a study on the erosion chronology of the Seebach Valley (Grischott et al. 2017), the cores were re-analysed regarding palynology and sedimentology (Drescher-Schneider & Reitner 2018). Taking in consideration also the reconstructed palaeoglaciation and the age of the Auernig rock avalanche, following results of the revision are notable: The basal sediments in 160–118 m depth were deposited by the Seebach Valley Glacier advancing in a proglacial lake dammed by the Auernig rock avalanche during the Gschnitz stadial. The sediments contain pollen derived from soils or deposits of older interstadials or interglacials. The record between 118 and 80 m shows glacio-lacustrine depositional conditions in contact to decaying ice. The following banded silt (80–48 m) is free of any indication for a lake in direct contact to glaciers. The corresponding pollen flora represents that of a grass tundra with first shrubs typical for the Oldest Dryas. The Bølling/Allerød-Interstadial (80–71 m) with a reforestation and the following massive climatic deterioration of the Younger Dryas (Egesen stadial, 71–61 m) are based on palynological evidence. The Holocene succession starting in 61 m depth with the early Preboreal is not continuous.

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