

PECULIAR HOLOCENE SOIL LAYERS: EVIDENCE OF POSSIBLE DISTAL EJECTA DEPOSITS IN THE CHIEMGAU REGION, SOUTHEAST GERMANY

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Introduction: In the early phase of investigations in the northern part of the proposed Chiemgau meteorite impact strewn field in southeast Germany [1] the strong magnetic signature of smaller crater-like structures [2, 3] raised attention as did extensive soil magnetic susceptibility measurements in forests that revealed significantly enhanced values at some decimeter depth [4]. The authors exclude industrial and geologic delivery but avoid to discuss a third possibility. Such a possibility was later introduced when similar horizons with peak magnetic susceptibilities were found also in the southern part of the strewn field where they were associated with various peculiar components such as fractured pebbles, cindery glass and carbonaceous spherules [1]. Here we report on one of these locations at Eglsee near Lake Chiemsee where we have studied the content of the anomalous soil horizon of enhanced susceptibility with a focus on the glass and glass-like particles. We treated the soil samples with nearly the same procedures described in [5] for unconsolidated samples, and used optical microscopy for the investigations.

Observations: The dark, clayey to sandy soil horizon under discussion is inserted in a loamy layer over glacial gravels at 0.5-1 m depth. The sandy fraction consists dominantly of angular quartz and quartz-rich rock fragments along with rounded components. A small part of the grains of millimeter and submillimeter size show very unusual features: - brownish to yellow translucent glass with irregular and fragile shapes, - glass cementing mineral and rock grains, - black humpy spheroids exhibiting beginning melting, - components of bottle or teardrop shape.

Discussion: The unusual composition and mixture excludes a common natural soil, farming and other human activities, and the depth points to a preindustrial age. Not any artifacts were observed. Melted soil material from wildfires is unlikely because of lacking charcoal. Glassy material from Holocene explosive volcanism would require a transport over more than 750 km (Mount Vesuvius, Italy). Reworked material from former events can be excluded because of the presence of very fragile particles and the distance to pre-ice age sediments of more than 10 km. From the obvious similarity of the horizon with layers of comparable facies containing micrometeorites [5, 6] we suggest the Eglsee layer to be also of impact origin possibly as a distal ejecta layer having originated from one or more of the proposed craters in the Chiemgau impact event. Another confirmed impact event of spatio-temporal relationship is unknown [7].

References:

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