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Stratigraphy, material characteristics and dating of periglacial slope deposits as a crucial element of the critical zone

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Widespread parts of the mid latitude mountains were largely unglaciated during the Wuermian, being a subject to humid-cold periglacial climate. Extensive sheets of periglacial slope deposits partially fill the valley bottoms and mantle the mountains, foreland hills, etc. Genesis and youngest age of the periglacial slope deposits is used as an important palaeoclimatic indicator. Although there is general agreement on the tripartite division of their lithostratigraphy, there is debate on the actual age of these deposits. The debate comes about because of conflicting interpretations of the efficacy of the Laacher See Tephra as a chronological marker. When the Plinian eruption of the Laacher See volcano occurred in Alleroed time its tephra plume extended over parts of the Central Highlands. Today, the tephra is often found as scattered shards intermingled with the periglacial deposits and, hence, some authors have assigned the periglacial slope deposits to a Younger Dryas age.

The fact that the Laacher See Tephra is found mixed with the periglacial slope deposits is, from the stratigraphical point of view, not a sufficient reason to conclude that the deposits are of the same age. It is in this context that our dates from several bogs whole over the Central European Highlands are critical in constraining the age of the periglacial slope deposits. In the case of Bavarian Forest peats just above the underlying periglacial slope deposits yielded radiocarbon dates which date the Upper Head, at a minimum, Older Dryas which is also consistent with palynological assignation of

those bogs to the chronological Pollen Zone Ia. In the Fichtelgebirge the minimum age of the Upper Head is also Older Dryas, dated by radiocarbon. Palynological work assigned these bogs to the Alleroed. In the Harz, all the palynological data show that the bogs were initiated during the Younger Dryas itself. Therefore, the Upper Head below the bogs has to be older than Alleroed. In the Rhoen bogs, the Laacher See Tephra is either found within the peat or lying as an undisturbed layer on the top of the Upper Head. The Rhoen bog itself was growing during the Boelling. Hence, nowhere in our study sites can the Upper Head be of Younger Dryas age as presumed in the literature since 40 years.

As they are the substratum for any Holocene soil development within the discussed latitudes and landscapes, special attention is given to the material characteristics of periglacial slope deposits. A lot of geochemical, mineralogical and not at least physical data of e.g. hydrological relevance are presented.