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Interactive comment on “Paleosols can promote root growth of the recent vegetation – a case study from the sandy soil-sediment sequence Rakt, the Netherlands” by M. I. Gocke et al.

Anonymous Referee #1

Received and published: 22 June 2016

The presented study analyses the distribution of roots in a soil profile with a fossil Plaggic Anthrosol, and combines the results with geochemical soil characteristics. This approach is rather new and reveals interesting implications for investigations of paleosol. The paper is generally well written and informative, but some arguments and phrases are not very comprehensible and especially the introduction and abstract should be checked.

1274, l. 9: Plaggic Anthrosols do not just establish in a soil, but they were formed by accumulation of material on top of a soil. 1274, l. 17: "living roots maximized with ca. 4450 and 220 m⁻²", this needs explanation. 1274, l. 22: How do "root investigations"

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explain "pedogenic investigations"? 1275, l. 1-3: Already the first sentence is a misleading: paleosols that developed in any kind of sediment are valuable archives, the point is that they need to be covered and preserved, which is usually happening due to aeolian processes, but also fluvial sediments can be important archives. 1275, l. 6-9: Soils, and especially soil formation processes, are usually not studied in only the first meter but in a whole soil profile including the parent material. Soil models are relating to recent developments. 1275, l. 28: There is no "period with plaggic agriculture", this technique was applied from Medieval times (or even earlier) to the beginning of the 20th century. 1276, l. 1: Soils cannot be chemically poor, but nutrient-poor. 1276, l. 22: What do you mean with "self-restoration"? 1277, l. 3: Which scales? Quantity? 1277, 9-10: The investigated parameters are actually not very "diverse" but rather standard. 1280, l. 10-12: Can you give more information about the sample preparation for XRF measurement? The sediment is nearly pure sand, so were the samples sieved or milled? Also, I wonder if the amounts of nutrients mentioned later are results from XRF measurements, which are total amounts and not plant available nutrients or pedogenic Fe. 1281, l. 25: Better use former or historic than "ancient". 1282, l. 24-27: This is a bit speculative. 1283, l. 4: Is b* not yellow and blue? 1283, 6-7: The absence of carbonates explains the low pH, not vice versa. 1285, l. 9-10: I cannot follow this argument, of course the plaggic soil contains higher amounts of Corg and nutrients that are related to organic matter, and less elements related to minerals. Also, the upper part of a Podzol should contain higher amounts of organic matter because there is a former topsoil. What exactly is translocated? 1288, l. 13-14: Can you give a reference for this "general assumption"? I can hardly believe that it is not known that especially trees have deeper roots. 1290, 6: How do you know which tree species were growing there before? I would not expect deciduous trees on a sandy soil.

Interactive comment on SOIL Discuss., 2, 1273, 2015.

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