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Red polygenetic soils and paleosols (RPS&P), which overlie subaerial unconformities on carbonate rocks and are susceptible to erosional and redepositional processes, provide useful insights into present and past soil formation processes and landscape dynamics in the Mediterranean region, as they occur along many continental shores and islands of the Mediterranean basin, especially on limestones. Seven RPS&P overlying limestone were studied on the Istrian Peninsula and Susak Island to determine and interpret the superposition of pedological and sedimentological processes that occurred on the youngest subaerial unconformity in the karst landscape. Provenance analysis showed that the allochthonous material from RPS&P was mainly from the Adriatic shelf, with two different signatures, Alpine/Apennine for all RPS&P except Savudrija, where flysch of Eocene age was a dominant source. The RPS&P dominantely formed in reworked loess and colluviated soil-sediments. Values for CIA, the Al/Si ratio, Fe, and Fed increased with depth from the top to the bottom of the RPS&P, which is generally consistent with the increase in clay content and thus with the process of lessivage. The Fed/Fet ratio (considered as weathering index) significantly distinguishes the analysed RPS &P from each other. This ratio varies between 0.20-0.28 in the Bok 1 paleosol and 0.79-0.85 in the Koreniki polygenetic soil. Accordingly, the RPS&P correspond to the RSG of Cambisols, Luvisols, Lixisols and Ferralsols, respectively. The clay mineralogy in the RPS&P corresponds to their weathering index. For example, the main clay mineral phases in the clay fraction of Bok 1 (Hypereutric Chromic Cambisol (Episiltic, Endoloamic)) are smectite and illite, while chlorite, mixed-layer chlorite-vermiculite, and kaolinite are subordinate. The predominant clay mineral phase in the clay fraction of Koreniki (Lixic Rhodic (Hyper)Ferritic? Ferralsol (Clayic, Hypereutric, Raptic)) is pedogenic kaolinite. The formation of RPS&P in the northern Adriatic was a recurrent process, i.e. RPS&P may have formed repeatedly in a specific and favourable soil environment on hard carbonate rocks since the Eocene. Possible

favourable periods include the Miocene Climatic Optimum, the mid-Piacenzian Warm Period (Pliocene), and the interglacials during the Quaternary.

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