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A Data mining and Meta-Analysis of Geodiversity and Geological Preservation Studies: Pedodiversity, the Other Side of the Coin

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Land degradation processes are complex and diverse (Yan and Cai, 2015; Álvarez-Martínez et al., 2016; Zhang et al., 2016). To understand the processes of degradation there is the need to understand a wide range of factors, including the sociological, biological, hydrological and geological components of the ecosystems (de Araujo et al., 2015; Li et al., 2016; Muñoz Rojas et al., 2016; Rodrigo Comino et al., 2016). Although the most widely accepted definitions of geodiversity include geology, landforms and soils, in practice published studies on the preservation of geodiversity typically ignore the soil resource and pay more attention to other items, while many others do not include soils in such definitions. Soils are a key component of the Earth system as they regulate the hydrological, erosional, biological and geochemical Earth cycles (Keesstra et al., 2012; Brevik et al., 2015), offer resources, goods and services to human societies (Mol and Keesstra, 2012), and are a key issue in the United Nations goals to achieve sustainability (Keesstra et al., 2016). The preservation of pedodiversity is practically ignored by governments. The same can be said in the acceptance of geoparks by UNESCO, when soils are ignored. A few researchers have paid attention to geodiversity (Ibáñez et al., 2016; Stavi et al., 2016).

In this study a data mining and metanalysis of this topic has been carried out using four different sources; Google, Google Scholar, Scopus, and the contents of Geoheritage journal. The results obtained show the same trends in all four studied sources. Soil resources are neglected in geodiversity studies as well as in the preservation of geological heritage against the scientific rationality inherent in the definition of geodiversity.

Furthermore, pedodiversity studies have been carried out by a small set of interested pedologists following the same conceptual frames and mathematical tools reaching interesting universal patterns and a common language, whereas initiatives directed at the quantification of geodiversity have not reached the development of a single or a small set of methodologies accepted by experts. Thus, while pedologists can compare the diversity of soil resources as well as pedodiversity and biodiversity relationships in different regions and environments, the reverse is not true in geodiversity analysis.

The authors' analysis of the state of the art, comparing it with what happened in the history of biodiversity research, led to the conclusion that the opportunism and vogue have dominated scientific rationality. There is not a geodiversity paradigm as some geodiversity experts contend and defend but rather a plethora of publications whose results are hardly comparable. This state-of-the-art shows the other side of the coin, which is the challenge of and future opportunities for research about geodiversity to contribute to the development of societies affected by land degradation processes.

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