



Species-specific effects on throughfall kinetic energy below 12 subtropical tree species are related to leaf traits and tree architecture

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Soil erosion impacts environmental systems widely, especially in subtropical China where high erosion rates occur. The comprehension about the mechanisms that induce soil erosion on agricultural land is broad, but erosion processes below forests are only rarely understood. Especially throughfall kinetic energy (TKE) is influenced by forests and their structure as well as their succession in many ways. Today, many forests are monoculture tree stands due to economic reasons by providing timber, fuel and pulp wood. Therefore, this study investigates the role of different monoculture forest stands on TKE that were afforested in 2008. The main questions are: Is TKE species-specific? What are characteristic leaf traits and tree architectural parameters that induce a species-specific effect on TKE and by what extend do they contribute to a mediation of species-specific effects on TKE?

We measured TKE of 12 different species in subtropical China using sand-filled splash cups during five rainfall events in summer 2013. In addition, 14 leaf traits and tree architectural parameters were registered to link species-specific effects on TKE to vegetation parameters.

Our results show that TKE is highly species-specific. Highest TKE was found below *Choerospondias axillaris* and *Sapindus mukorossi*, while *Schima superba* showed lowest TKE. The latter species can be regarded as key species for reduced erosion occurrence. This species effect is mediated by leaf habit, leaf area, leaf pinnation, leaf margin, tree ground diameter, crown base height, tree height, number of branches and LAI as biotic factors and rainfall amount as abiotic factor. Moreover, leaf habit, tree height and LA show high effect sizes on TKE and can be considered as major drivers evoking TKE differences below vegetation.