Abstract

Although gully erosion represents an important process of land degradation, only a few studies in the Czechia have quantified the gully erosion rate yet. Because of the complex and nonlinear dynamics, the estimation of the gully erosion rate requires a long term and technically difficult research. However, a recent methodological approach in dendrogeomorphology allows to reconstruct a gully development and assess gully erosion rate. Based on geodetic survey, a detailed mapping of four gullies in the Polomené Mountains was carried out. Subsequently, the gully erosion rate was evaluated by the analysis of 73 exposed roots of broadleaved trees. The first erosion episode was detected in 1981, however, most of the roots were exposed in the last 15 years. Gullies have been forming non-continuously showing median erosion rates between 10.0 to 13.4 mm/year. Even though topographic parameters and land use changes in drainage basin area may affect the intensity of erosion, most of the erosion episodes have been probably triggered by extreme rainfall events. This study exemplifies that intesive gully erosion may occur even on forest soils. Vegetation cover influences a morphology of gully slopes, but its ability to prevent intensive gully erosion is limited.

Keywords: gully, erosion rate, exposed roots, dendrogeomorphology, erosion factors