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Relationship between plant traits and resistance to burial by marly sediment

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In marly lands of the French Southern Alps, harsh soil erosion results in sediment movements during intensive rainfall events. Plants can be submitted to sediment burial in their early stages of development and their protective function may be reduced. In a context of land restoration, it is important to know species resistance to environmental disturbances and to be able to predict it, in particular from plant traits (height, biomass, sugar and starch accumulation). However, few studies about woody species tolerance to burial by sediment have been carried out. Seedlings of five woody species were buried in marly sediment at three different depths in pot experiment during eight weeks: no burial (control), partial burial (50% stem height) and complete burial (100% stem height). Height through time, biomass and survival rates were measured to assess species resistance to burial. Results show that among the five species, only one (Acer campestre) survived complete burial. All plants survived partial burial, but there were significant differences in height and biomass between buried plants and control, and significant differences between species responses. Three different responses to disturbance were identified: negative (Hippophae rhamnoides, Ononis fruticosa), neutral (Robinia pseudo acacia, Pinus nigra) and positive (Acer campestre). Results finally suggest that species resistance to burial by marly sediment is related to sugar accumulation in plant stems.