



Millet, maize and sorghum grow typically on Samarco's mining tailings

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With the failure of the Fundão dam in Mariana-MG in 2015, over 50 million m³ of tailings were leaked, leaving a trail of destruction and socio-environmental consequences from Minas Gerais to the mouth of the Doce River in Espírito Santo. Samples have undergone chemical and physical characterization, which revealed some chemical elements above of that allowed by regulations. Furthermore, physical and chemical attributes of the tailings led to compaction trend, which restricts the flora's restoration. Thus, the present study aimed to analyse the effects of the mining tailings from the Fundão dam on seedling germination and initial growth of three plant species: millet (*Pennisetum glaucum* (L.) R. Br., 1502), maize (*Zea mays* L., DKB390) and sorghum (*Sorghum bicolor*, BRS332). Therefore, such species were grown in germination boxes containing different proportions of mining tailings (T) and sand (S), respectively: 1T, 3T:1S, 1T:1S, 1T:3S, 1S, for 9 days. Each treatment had 5 replicates of 50 seeds. The parameters analysed were germination percentage (G%) an index velocity of germination (IVG) in 48h and, after 9 days, shoot and root length, chlorophyll a fluorescence parameters (Qy_max, maximum quantum yield of PSII photochemistry; qP, photochemical quenching; qN, non-photochemical quenching) and seedlings dry biomass. Tailings interfere in a non-proportional way in the germination of seeds. For the seedlings of millet and sorghum, there was an increase in shoots height proportionally to the amount of tailings, while a reduction of root length occurred for the three species. Only maize showed an increase in dry biomass relational to the mining tailings. As for fluorescence, small variations were observed in maize and sorghum seedlings only. Therefore, the mining tailings from the Fundão dam show little interference in the initial growth of millet, maize and sorghum.

Keywords: Soil compaction, *Pennisetum glaucum*, *Zea mays*, *Sorghum bicolor*, germination