Large macroaggregate properties are sensitive to the conversion of pure plantation to uneven-aged mixed plantations

发布者： [发表时间]：2020-06-18 [来源]： [浏览次数]：394

论文题目： Large macroaggregate properties are sensitive to the conversion of pure plantation to uneven-aged mixed plantations

论文作者： HaidongXu,HaijingYuan,MukuiYu,XiangrongCheng*

期刊来源： Catena

论文摘要： In forestry, stand conversion influences soil physicochemical and biological properties, yet the effects of conversion of pure plantation to uneven-aged mixed plantation on soil aggregate distribution and stability, C/N/P stoichiometry and enzyme activity remain unclear. We studied the distribution of water-stable aggregate fractions, mean weight diameter (MWD), stoichiometric ratios (C/N, C/P, and N/P), and urease, invertase, and acid phosphatase activity in the soils of pure and uneven-aged mixed plantations (including artificially and naturally established mixed plantations). The mixed plantations showed improved bulk soil and aggregate physiochemical and biological properties, including higher soil organic C (OC), total N (TN), total P (TP), and enzyme activity in the artificially mixed plantations than in the naturally established mixed plantation. Additionally, in contrast to pure plantation soil, mixed plantation soil showed a significant decrease in the microaggregate (MA) (<0.25 mm) mass fractions, and a marked increase in the proportion of large macroaggregate (LMA) (>2 mm), MWD, and other soil properties (especially OC and TN content, stoichiometric ratios, and enzyme activity in LMA). Principal component analysis indicated that compared to other aggregate sizes, LMA had a significant effect on soil properties, and LMA mass fractions were strongly positively correlated with OC, TN, C/N, and MWD in the bulk soils. Moreover, OC and nutrient content, stoichiometric ratios, and enzyme activity in LMA were significantly positively correlated with the corresponding variables in the bulk soils. These findings indicate that LMA properties can be used as sensitive indicators to changes in soil properties after stand conversion from pure to uneven-aged mixed plantation.

论文链接： https://doi.org/10.1016/j.catena.2020.104724