

Postprint of a Study on Factors Influencing the Shear Strength of Root-Soil Composites

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Abstract

To compare the influence degree of root-soil composite components and normal stress on its shear strength, root-soil composites of *Pinus yunnanensis* and plain soil from the slope surface of Mianshan Town, Xide County, Sichuan Province (gravel-sand area of the Anning River Basin) were selected as research objects. The shear strength was obtained through laboratory direct shear tests, and the mass of each component was obtained through oven-drying tests. Pearson correlation analysis was conducted using the dry soil mass, water mass, and dry root mass of the root-soil composite, and a regression analysis model was constructed to calculate the standardized regression coefficients between the mass of each component of the root-soil composite and shear strength. The results showed that there was a significant negative correlation between the dry soil mass and dry root mass of the root-soil composite ($P=0.002<0.01$, $r=-0.792$), and there was no significant correlation between water mass and dry soil mass or dry root mass in the root-soil composite ($P>0.05$). The standardized regression coefficients of dry soil mass, dry root mass, and water mass with shear strength in the *Pinus yunnanensis* root-soil composite were 0.06, 0.03, and 0.03, respectively, indicating that the influence degree of dry soil mass on the shear strength of the root-soil composite was greater than that of water mass and dry root mass. Compared with the internal friction angle and cohesion of plain soil, the internal friction angle of the *Pinus yunnanensis* root-soil composite increased by 1.31%–1.97%, and the cohesion increased by 16.71%–34.74%.

Full Text

Preamble

[The preamble text is extensively corrupted and cannot be reliably translated. Only the section heading and mathematical placeholders are preserved.]

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Terminology Glossary

- *jìqī xuéxī*: machine learning
- *shēndū xuéxī*: deep learning

Note: Figure translations are in progress. See original paper for figures.

Source: ChinaXiv — Machine translation. Verify with original.