Impact of simulated acid rain on soil base cations dissolution between *Eucalyptus* pure plantations and *Eucalyptus-Castanopsis fissa* mixed plantations

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Abstract: 【Objective】To comprehend how soil base ions react to acid deposition and how well they can protect the soil from becoming too acidic 【Method】This study used acid solution soil column leaching experiments to study the soil of pure eucalyptus plantation and artificial forest. 【Result】The results showed that acid rain leaching increased the leaching loss, desorption, and desorption rate of soil base ions, while decreasing the soil pH value, adsorption, and adsorption rate of soil base ions. The soil pH value and the leaching loss ranges of K^+, Na^+, and Mg^{2+} were all greater in the pure plantations than in the mixed plantations, while the leaching range of Ca^{2+} in the mixed plantations was larger than that in the pure plantation. In the two types of plantations, the adsorption rates of Ca^{2+} and Na+ in the mixed plantations were higher than those in the pure plantations, while K^+ and Mg^{2+} showed higher adsorption rates in the pure plantations than in the mixed plantations. Among the four ions, the adsorption rate of Ca^{2+} was the highest at 17.9%. The desorption rate of the pure plantations was significantly higher than that of the mixed plantations. Therefore, soil pH and base ions were greatly affected by the pH value of acid rain. Compared with the pure plantation, the establishment of *Eucalyptus-Castanopsis fissa* mixed plantations can slow soil acidification and leaching of K^+, Na^+, and Mg^{2+}, and contribute to the adsorption of Ca^{2+} and Na^+ which is beneficial to the soil nutrient fixation of *Eucalyptus* plantations. 【Conclusion】Therefore, as a mixed species of *Eucalyptus, Castanopsis fissa* can slow down the impact of acid rain on soil acidification of artificial plantations land to a certain extent, and play an important role in optimizing the structure of *Eucalyptus* plantation stand and maintaining the productivity of the stand.

Keywords: *Eucalyptus plantations;* acid deposition; base cations; adsorption; desorption

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