Figures caption:

FIGURE 1 Location of research area and the three study sites in Jianshui County, Yunnan Province, China.

FIGURE 2 Main steps of infiltration experiment: (a) identification of envelope curves on radargram; (b) soil profile at pedon 1 (yellow dotted lines represent the boundary between horizons, white dashed boxes represent cracks found during excavation); (c) Plexiglas columns for experiment and text device; and (d) experimental groups to be performed.

FIGURE 3 Infiltration process over time in different treatments (only IR1.5, ΛR1.5, and VR1.5 treatments are shown here), with blue lines indicating dye traces, yellow lines indicating moisture wetting front traces, and red dotted regions indicating that the preferential flow occurred after 40 minutes.

FIGURE 4 Comparison of dye-stained and wetting areas for I- and Λ-shaped cracks filled with rock fragment treatment (the wetting area was wetted by water, excluding the area wetted by Brilliant Blue FCF solution). The shaded part after the fitted line represented the 95% confidence interval.

FIGURE 5 Effect of crack inclusion (only CK, IR2, ΛR1.5, ΛS1.5, and IS2 treatments are shown here).

FIGURE 6 Effect of crack width (the crack width is the average of tests).

FIGURE 7 Effect of CK, IR1.5, VR1.5, and ΛR1.5 treatments crack configurations.

FIGURE 8 Effect of crack inclusion (a), crack width (b), and crack configuration (c) on the mean infiltration rate, dye-penetration depth, cumulative information, and wetting front depth. Different lowercase letters indicate significant differences between treatments at $p < 0.05$ (e.g. a, b, and c indicate significant differences; a and ab indicate no significant differences). The error bars indicate the standard deviation of 3–4 replicates.

FIGURE 9 Dye coverage of soil vertical profiles and stained area ratio for the I- and Λ-shaped configurations filled with rock fragment are shown here.