



**Figure S1.** Effects of subculture cycle, hormone ratio, and carbon source on antioxidants in *Pinus koraiensis* embryogenic callus during long-term subculture. Note: a: CAT activity of different subculture cycles; b: H<sub>2</sub>O<sub>2</sub> content of different subculture cycles; c: CAT activity of different hormone ratios; d: H<sub>2</sub>O<sub>2</sub> content of different hormone ratios; e: CAT activity of different carbon sources; f: H<sub>2</sub>O<sub>2</sub> content of different carbon sources; Different letters (upper or lower case) in the table indicate significant differences between columns (Duncan's multiple range test;  $p = 0.05$ ).