A potential allelopathic substance in Paspalum commersonii Lam.

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Abstract

Paspalum commersonii (Poaceae), a 15 to 20 cm tall perennial weed, is native to South Africa and widely distributed in India, Indonesia, Bangladesh and Myanmar. We explored the allelopathic potential of *P. commersonii* and determined the putative allelopathic substances in its, as no study has been found so far on allelopathy of *P. commersonii*. The aqueous methanol extracts of *P. commersonii* were tested against on the shoot and root growth of cress, lettuce, alfalfa, rapeseed, barnyard grass, Italian ryegrass, timothy and foxtail fescue at six concentrations. The aqueous methanol extracts showed growth inhibitory effects on the tested plants in a concentration dependent manner. The root growth of the test plants were suppressed more than the shoot growth. These results indicate that, the extracts of *P. commersonii* have allelopathic properties and thus may contain allelopathic substances. The extracts were partitioned with equal volume of ethyl acetate and the ethyl acetate fraction was subsequently purified by silica gel column, Sephadex LH-20, C18 cartridges and HPLC. An active substance was purified and characterized as loliolide by the specific rotation, HRESIMS and 1H NMR spectrum. The seedling growth of cress and barnyard grass were inhibited by the loliolide at the concentration greater than 10 μM and 30 μM, respectively. The required concentrations for 50% growth inhibition of cress and barnyard grass were ranged 32.1 to 41.6 μM and 48.3 to 128.5 μM, respectively by the loliolide. Therefore, the allelopathic substance loliolide may be responsible for exhibiting the inhibitory activity in *P. commersonii*.

Keywords: Allelopathic activity, Paspalum commersonii, Allelopathic substance, Loliolide

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