
Allelopathy and allelopathic substance in *Caesalpinia mimosoides* Lamk.

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Abstract

Caesalpinia mimosoides Lamk. (Fabaceae) is a medicinal plant distributed in Southeast Asia. The young shoots and leaves of *C. mimosoides* are mainly consumed as fresh vegetable in Thailand and also used for traditional treatments. Although its pharmacological values are well-known, but no study has reported on its allelopathic activity. Therefore, we evaluated the allelopathic potential of leaf and stem extracts of *C. mimosoides* on the growth of six test plants to find out allelopathic substances. The aqueous methanol extracts of *C. mimosoides* leaves and stems exhibited the inhibitory effects on the growth of cress, alfalfa, lettuce, foxtail fescue, timothy and barnyard grass. The growth of test plants decreased as the concentration of the extracts increased. These results suggest that leaf and stem extracts of *C. mimosoides* may possess allelopathic substances. However, the comparison of the *I*₅₀ values between leaf and stem extracts indicates that the leaf extracts had more growth inhibitory effects on the tested plants than the stem extracts. The leaf extracts were subjected to partition with ethyl acetate, and the ethyl acetate fraction was then purified by column chromatographies. A growth inhibitory substance was isolated and identified by spectral analysis as methyl gallate. This is the first time of the isolation of methyl gallate from *C. mimosoides*. At the concentration of 10 mM of methyl gallate, the shoot of cress was completely inhibited and the root was inhibited by 4.7% of control growth. The *I*₅₀ values of methyl gallate on the growth of cress shoots and roots were 2.4 and 2.9 mM, respectively. The growth inhibitory effects of methyl gallate suggest that it may act as an allelopathic substance of *C. mimosoides*.

Keywords: Allelopathic activity, Inhibitory effect, *Caesalpinia mimosoides*, Methyl gallate

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