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Phytotoxicity of leaves of *Brunfelsia pauciflora* and *Syzygium aromaticum*

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Herbicides, while essential for weed control in crops, have led to issues such as weed resistance and environmental damage due to their frequent and careless application. Therefore, it is crucial to reduce our dependence on synthetic herbicides. Hence, this study is focused on the phytotoxicity of *Brunfelsia pauciflora* (Solanaceae) leaves and *Syzygium aromaticum* (Myrtaceae) leaves. They were commonly known as 'Brazil rain tree' and 'Clove' respectively. The leaves of *B. pauciflora* and *S. aromaticum* were freshly collected from the Central Province, Sri Lanka. After harvesting, the leaves were air-dried, followed by grinding into a fine powder. These powdered leaf samples were then separately sonicated three times with dichloromethane (CH_2Cl_2) and methanol (MeOH) for 30 minutes, resulting in the extraction of their bioactive compounds. The crude extracts from these four samples were subjected to a comprehensive assessment of their phytotoxicity using a lettuce (*Lactuca sativa*) seed germination assay. This evaluation involved calculating the IC_{50} values for root and shoot inhibition. IC_{50} values of root inhibition of CH_2Cl_2 extracts of *S. aromaticum* and *B. pauciflora* were 223.51 mg L^{-1} and 1197.2 mg L^{-1} respectively. IC_{50} values of shoot inhibition of CH_2Cl_2 extracts of *S. aromaticum* and *B. pauciflora* were 629.03 mg L^{-1} and 1885.99 mg L^{-1} respectively. MeOH extract of *B. pauciflora* inhibited the root germination with an IC_{50} value of 1052.78 mg L^{-1}. Its IC_{50} for shoot inhibition was recorded as 2208.44 mg L^{-1}. MeOH extract of *S. aromaticum* resulted an IC_{50} of 1708.41 mg L^{-1} for root inhibition and 1141.57 mg L^{-1} for shoot inhibition. IC_{50} values of root and shoot inhibition of abscisic acid (positive control) were at 0.99 mg L^{-1} and 1.11 mg L^{-1} respectively. Therefore, the CH_2Cl_2 extract of *S. aromaticum* has a moderate potential to inhibit both shoot and the root germination of lettuce seeds.

Keywords: *Brunfelsia pauciflora, phytotoxicity, root inhibition, shoot inhibition, Syzygium aromaticum*