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Allelopathic Action of Diferents Sorghum bicolor [L.] Moench Fractions on Ipomoea grandifolia [Dammer] O'Donell

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Abstract : Weeds compete with agricultural crops for resources such as light, water, and nutrients. This competition can cause significant damage to agricultural producers, and, currently, the use of agrochemicals is the most effective method for controlling these undesirable plants. Morning glory (Ipomoea grandifolia [Dammer] O'Donell) is an aggressive weed and significantly reduces agricultural productivity making harvesting difficult, especially mechanical harvesting. The biggest challenge in modern agriculture is to preserve high productivity reducing environmental damage and maintaining soil characteristics. No-till is a sustainable practice that can reduce the use of agrochemicals and environmental impacts due to the presence of plant residues in the soil, which release allelopathic compounds and reduce the incidence or alter the growth and development of crops and weeds. Sorghum (Sorghum bicolor [L.] Moench) is a forage with proven allelopathic activity, mainly for producing sorgholeone. In this context, this research aimed to evaluate the allelopathic action of sorghum fractions using hexane, dichloromethane, butanol, and ethyl acetate on the germination and initial growth of morning glory. The parameters analyzed were the percentage of germination, speed of germination, seedling length, and biomass weight (fresh and dry). The bioassays were performed in Petri dishes, kept in an incubation chamber for 7 days, at 25 °C, with a 12h photoperiod. The experimental design was completely randomized, with five replicates of each treatment. The data were evaluated by analysis of variance, and the averages between each treatment were compared using the Scott Knott test at a 5% significance level. The results indicated that the dichloromethane and ethyl acetate fractions showed bioherbicidal effects, promoting effective reductions on germination and initial growth of the morning glory. It was concluded that allelochemicals were probably extracted in these fractions. These secondary metabolites can reduce the use of agrochemicals and environmental impact, making agricultural production systems more sustainable.

Keywords : allelochemicals, secondary metabolism, sorgoleone, weeds
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