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- Document Title** : Allelopathic potential of *Zygophyllum coccineum* (L.) on germination and growth of some plants  
القدرة الأليوباثية للرطريط على إنبات ونمو بعض النباتات
- Document Language** : Arabic
- Abstract** : Allelopathy is defined as any process involving the production of secondary metabolites known as allelochemicals by plants which released to the environment that influence the growth and development of other plants. *Zygophyllum coccineum* is one of the widely distributed plants in most areas of Saudi Arabia. The previous studies proved that it contained many secondary products that are known as allelochemicals compounds. This research aims to study the allelopathic potential of *Z. coccineum* on germination and growth of some crop plants (*Zea mays* and *Cucumis sativus*) and one weed plant (*Sorghum sudanense*). Water extract from shoot system of *Z. coccineum* with different concentration (2.5, 5, 10, and 15%) was prepared, in addition to distilled water (control) for study their effects on germination of study plants. Results shown great reduce in germination rate increase with increasing of extract concentration, specially under effect of high concentration 15% which completely inhibit germination in *Cucumis sativus* and *Sorghum sudanense* seeds, and there was clear gradual reduction in the length of the radicle and plumule lengths, in addition to discolored of radicle to brownish colour in terminated seedling compared with control. The seedling growth was more sensitive than the seed germination. The allelopathic effect of *Z. coccineum* on growth was tested by two ways, first as water extract from shoot system, and second by mixing the ground dry plant material with soil in gradual treatments (1, 2, and 3g/kg soil). Results showed an morphological effect on growth criteria, where shoot system length decreased in the most studied plants with the two applied ways especially in *Sorghum sudanense* treated with the highest concentration (15%), Fresh and dry weight was decreased in all tested plants, it was clear that *Cucumis sativus* affected by higher concentrations (10, 15%) comparing with *Zea mays* and *Sorghum sudanense*. Results indicated loss in water content in plants, especially *Sorghum sudanense*. By calculating tolerance index for studied plants, results indicated its reduction in *Cucumis sativus* (dicotyledonous plant) as compared with *Zea mays* and *Sorghum sudanense* (monocotyledonous plants). this indicated that dicotyledonous plant was more sensitive for allelopathic compounds than monocotyledonous plants. As well as different metabolic processes were affected, which caused a decrease in pigments, and carbohydrate content, especially in *Sorghum sudanense*. It was observed proline accumulation with high rates in all studied plants, *Sorghum sudanense* was greater affected at the highest concentration (15%), this indicated that weed plant was under higher stress than the other two crop plants. Results indicated that allelochemical released from water extract and dry plant material of *Z. coccineum*, suppressed minerals uptake in most plants, except Mg uptake which accumulated significantly in most plants especially *Cucumis sativus*. It could be concluded, that water extract of *Z. coccineum* led to suppression of germination and seedling growth, its effect on morphological growth criteria and some metabolic physiological parameters more pronounced by using it as dried residue of *Z. coccineum*. We can utilize the allelopathic potential of *Z. coccineum* by application in planning for weeds biological control inside agricultural systems and using its allelochemicals compounds as templates for produce new herbicide, natural and safe to the environment.
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