



Allelopathic Effects of Common Weeds on Durum Wheat Germination and Early Growth in Northwest Algeria

Chemouri Somia^{1,2,3*}, Rabah Mazari Narimane¹, Babi Radja¹, Belabbes Mohamed¹

¹Higher School of Agronomy Mostaganem, Department of Second Cycle, 27000, Mostaganem, Algeria.

²Laboratory of Biodiversity and Conservation of Water and Soil, 27000, Mostaganem, Algeria.

³Laboratory of Agricultural and Agro-Food Production Techniques and Sustainable Development, 27000, Mostaganem, Algeria.

Abstract

Weeds exert strong allelopathic interactions that can negatively affect crop establishment, making their study essential for sustainable agriculture. This work examined the allelopathic potential of three common species—*Malva sylvestris* L., *Oxalis pes-caprae* L., and *Fumaria capreolata* L.—on the early growth stages of durum wheat (*Triticum turgidum* subsp. *durum* (Desf.) Husn.). Plant material was collected from citrus orchards in the Tlemcen region of Northwest Algeria, and aqueous extracts were prepared from dried aerial parts using two methods: shaking (EA1) and maceration (EA2). Extracts were applied at graded concentrations (0%, 25%, 50%, 75%, and 100%) to evaluate their effects on germination, coleoptile elongation, and radicle growth. The study measured germination percentage, coleoptile length, radicle length, and inhibition rates, with statistical analysis performed using two-way ANOVA. Results revealed significant and dose-dependent inhibition of wheat development, with clear differences among species. *M. sylvestris* showed the strongest allelopathic activity, reaching complete inhibition at high concentrations with EA1. *O. pes-caprae* exerted moderate and progressive effects, occasionally stimulating growth at low doses, while *F. capreolata* displayed a subtler but increasingly pronounced impact at higher concentrations, particularly on radicle elongation. Across treatments, EA1 extracts were generally more effective than EA2, emphasizing the importance of extraction protocol in determining bioactivity. These findings demonstrate that *M. sylvestris* and *F. capreolata* possess considerable allelopathic potential and could serve as sources of natural compounds for plant-based weed control. Their valorization may contribute to the development of eco-friendly strategies for managing weeds in cereal production systems.

Keywords: Allelopathy, weeds, durum wheat, aqueous extracts, biocontrol, germination

