

8<sup>th</sup> **World** Congress  
of **ALLELOPATHY**  
Allelopathy for sustainable ecosystems

# PROGRAM

WCA8|2017

Marseille, France

24-28 July 2017



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# Potential control of weeds and plant pathogens by *Cynara cardunculus* L. leaf extracts

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Allelochemicals from donor plants represent an eco-friendly strategy for weed and pest control in agriculture. *Cynara cardunculus* L. leaves present a high concentration of sesquiterpene lactones such as aguerin B, grosheimin, and cynaropicrin. However, the potential use of their extracts for weed and plant pathogen biological control is at the beginning of investigation. This study aimed to evaluate the allelopathic effects of leaf aqueous extracts (40 and 80% concentrations) of three *C. cardunculus* botanical varieties, globe artichoke [var. *scolymus* (L.) Fiori], cultivated cardoon (var. *altilis* DC.), and wild cardoon [var. *sylvestris* (Lamk) Fiori], on seed germination of six common weeds in Mediterranean agroecosystems (*Amaranthus retroflexus* L., *Portulaca oleracea* L., *Diploaxis erucoides* (L.) DC., *Lavatera arborea* L., *Brassica campestris* L., and *Solanum nigrum* L.), compared with distilled water as a control. The autoallelopathic activity on wild cardoon also was considered. Different leaf extract typologies obtained by methanolic, ethanolic, and aqueous extraction, starting from fresh, dried, and lyophilized leaves were compared. Furthermore, the addition of acetic or citric acid was compared in order to reach the microbiological stabilization of the extract. Cultivated cardoon extracts exhibited *in vitro* antagonistic activity against pre- and postharvest phytopathogenic fungi and bacteria, with better inhibition efficacy of water and ethanolic extracts compared with methanolic extracts. On average, leaf aqueous extracts reduced seed germination by 41% compared with the control. The best result was obtained with cultivated cardoon extract at 80%, which inhibited weed seed germination by about 64%. Methanolic, acidified extracts appeared to inhibit seed germination more than did the aqueous, non-acidified ones. These results hold promise for the development and production of bioherbicides, biofungicides, and biobactericides based on *C. cardunculus* allelochemicals as alternatives to chemical products.

**Keywords:** leaf extracts, weeds, globe artichoke, wild cardoon, cultivated cardoon, allelochemicals

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