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Allelopathy, seed germination, weed control and bioassay methods

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ABSTRACT

Even before its formal establishment as a scientific discipline, allelopathy has been intertwined with agriculture and the potential of allelopathy for weed control has been a permanent matter of interest. Therefore we investigate the importance of seeds and of permanent soil seed banks as a means for propagation of weed species as well as strategies for long-term weed control. Depleting seed banks is critical and encouraging weed seed germination prior to sowing crops is one of the most promising targets for weed control by allelopathins. The share of interest in weed control and in germination in *Allelopathy Journal* is also examined. Finally we present and discuss methodologic aspects to be taken into account in allelopathic studies for efficient weed control by either permanently inhibiting weed seed germination or by stimulating weed seed germination.

Key words: Allelopathy, bibliometrics, bioassay, germination, inhibition of germination, permanent effects, recovery of germination, stimulation of germination, weed control.

INTRODUCTION

Allelopathy was first defined by Hans Molisch in 1937 as the reciprocal, or mutual, grief or effects of one plant upon another (48) and about some sixty years later a much more detailed and almost all-encompassing definition was set by the International Allelopathy Society, according to which allelopathy means any process involving secondary metabolites produced by plants, algae, bacteria, and fungi that influence the growth and development of agricultural and biological systems.

Not surprisingly agricultural and biological systems were named in the definition of allelopathy and even less surprisingly, agricultural systems came first. In fact, even before being named as such, allelopathic processes were investigated in relation to agricultural issues, the best example probably being 'soil sickness' studies in the first half of 19th century (13,74,76). Afterwards, agricultural matters remained in the front line of concern frequently surpassing strictly biological issues, including ecological ones, in impact, visibility, and outside perception. For example, between the first and the second edition of Rice's reviews (59,60) the number of pages directly devoted to agricultural issues, including horticulture and forestry, grew from 53 to 111 and from 17% to 31% of

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