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Review on Use of Plant Extracts in Weed Control

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Abstract

Allelopathy is a natural weed control approach. It could be used without adverse effects on the environment. Allelochemicals in the plants could be used to control weeds in an environment friendly manner. Several plant extracts are used to control different weeds in many parts of the world. However commercial products of plant-based weedicides would need to be developed to obtain maximum benefits.

Keywords: Allelochemicals; Allelopathy; Weed control; Weedicides

Introduction

Weeds are important factor in agriculture, which influence crop yields. Presently, weeds have been controlled by using synthetic weedicides. These chemicals have a negative impact on the environment [1] and human health [2]. Use of allelopathy is an environment-friendly option for weed control [3,4]. Allelopathy is identified as a natural weed control approach [5,6]. Different plants have different allelochemicals. These chemicals could be utilized for suppressing weeds [7].

Discussion

It was reported that several ornamental plants have the potential to suppress growth of weeds. Nerium (*Nerium oleander L.*) plant extract has herbicidal activity. Nerium flower extract suppressed the growth of Italian ryegrass [8]. Al-Samarai et al. [1] reported that aqueous extract of Nerium leaves showed inhibition on the germination and seedling growth of purple nut sedge (*Cyperus rotundus L.*). It was reported that, Thevetia peruviana has the effect on *Parthneium hysterophorus* [9]. Baličević et al. [10] stated that, marigold has allelopathic effects on hoary cress. Aqueous extracts obtained from *Chrysanthemum morifolium* had inhibitory effects against weeds [11].

Some food crops also consist of alleopathic effects against weeds. Sorgum and maize extracts are used as organic herbicides. Randhawa et al. [7] opined that aqueous extract of sorghum at higher concentration reduced the germination of *Trianthema portulacastrum*. Khan et al. [12] found that, leaf water extracts of sorghum and sunflower could be used to suppress weeds in wheat cultivation during growing season. Jabran [13] reported that allelopathic potential of maize could be used for weed control. Herbaceous plants extracts also have weedicidal characters. Aqueous extract of *Salvia moorcroftiana* and *Verbascum* thapsus had weed suppressing effects [3]. Aqueous extracts of *Houttuynia cordata* has the ability suppress rice weeds namely *Echinochloa* and *Monochoria* [14].

Tree leaves extract also has the weed suppressing effects. It was reported that methanol extract of teak leaves could be considered as a potential pre-emergent herbicide for controlling the wild rice weeds [15]. Neem (*Azadirachta indica*). A. Juss) bark and leaves extracts suppressed germination and growth of *Echinochloa crus-galli, Monochoria vaginalis*, and *Aeschynomene indica L.* in a bioassay and in soil. It was also reported that concentration of phenolic compounds was higher in bark [16].

Several weedy plants extract also has herbicidal activities. *Chenopodium album L.* shoot residue has the ability suppress shoots and tuber formation of *Cyprus esculantus* [17]. Akhtar et al, [5] reported that aqueous extracts of *Cirsium arvense* and *Ageratum conyzoides* have the weedicidal activity against the weeds *Phalaris minor* and *Poa annua.*

Conclusion

There is increasing demand for plant-based herbicides. Use plant extracts in weed control is an environmentally friendly option. However, use of plant based weedcides is not much popular among farmers. Therefore, commercial products should be developed to increase their usage in Agriculture.

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