

## ALLELOPATHY – NEW INTERPRETATIONS OF PLANT – PLANT INTERACTIONS

### S u m m a r y

Allelopathy denotes biochemical interactions among all types of plants and microorganisms. Allelochemicals occur in the majority of secondary plant products and belong to terpenoids, phenolic compounds, phenylpropane derivatives, flavonoids, organic cyanides, long-chain fatty acids. In fields, allelopathy involves a complex of compounds, which complicates investigations of underlying mechanisms of its appearance.

There is no single physiological function controlled by allelochemicals. The action of allelochemicals is diverse and affects a large number of physiological functions and biochemical reactions eg.: seed germination, cell division, cell elongation, membrane permeability and ion uptake. Significant effects of allelochemicals on photosynthesis and respiration have been also observed.

The reduction of crop yields by weed competition is aggravated by the allelopathic effect of weeds on crop. Crop plants may inhibit their own growth and reduce the yield of subsequent crops due to the so called soil sickness. Crop rotation helps to cures soil sickness

only when the subsequent crop is not affected by the accumulated allelochemicals of the previous crop or when they have been detoxified by soil microorganisms. Allelopathic weed control with crop plants has long been practised by farmers and horticulturists. The challenge is twofold: to minimize the negative impact of allelochemicals on crop growth and yield and to exploit allelopathic mechanisms for pest control and crop growth regulation strategies. Allelochemicals in new crop cultivars may provide naturally occurring pesticides that can limit or suppress weeds as well as prevent insect and nematode attack and damage. Biotechnology resources for the production of herbicide-resistant crops could then be channeled into the engineering of other desired crops qualities. Allelochemicals may furnish an entirely new generation of naturally produced weed-controlling compounds, replacing synthetic herbicides and other pesticides with nonaccumulating easy-degradable substances.