

## A Perspective on Allelopathic Potential of *Corylus avellana* L.

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**Abstract :** One of the most important constraints that decrease the crop yields are weeds. Increased amount and number of chemical herbicides are being utilized every day to control weeds. Chemical herbicides which cause environmental effects, and limitations on implementation of them have led to the nonchemical alternatives in the management of weeds. It is needed increasingly the application of allelopathy as a nonherbicidal innovation to control weed populations in integrated weed management. It is not only because of public concern about herbicide use, but also increased agricultural costs and herbicide resistance weeds. Allelopathy is defined as a common biological phenomenon, direct or indirect interaction which one plant or organism produces biochemicals influence the physiological processes of another neighboring plant or organism. Biochemicals involved in allelopathy are called allelochemicals that influence beneficially or detrimentally the growth, survival, development, and reproduction of other plant or organisms. All plant parts could have allelochemicals which are secondary plant metabolites. Allelochemicals are released to environment, influence the germination and seedling growth of neighbors' weeds; that is the way how allelopathy is applied for weed control. Crop cultivars have significantly different ability for inhibiting the growth of certain weeds. So, a high commercial value crop *Corylus avellana* L. and its byproducts were chosen to introduce for their allelopathic potential in this research. Edible nut of *Corylus avellana* L., commonly known as hazelnut is commercially valuable crop with byproducts; skin, hard shell, green leafy cover, and tree leaf. Research on allelopathic potential of a plant by using the sandwich bioassay method and investigation growth inhibitory activity is the first step to develop new and environmentally friendly alternatives for weed control. Thus, the objective of this research is to determine allelopathic potential of *C. avellana* L. and its byproducts by using sandwich method and to determine effective concentrations (EC) of their extracts for inducing half-maximum elongation inhibition on radicle of test plant, EC<sub>50</sub>. The sandwich method is reliable and fast bioassay, very useful for allelopathic screening under laboratory conditions. In experiments, lettuce (*Lactuca sativa* L.) seeds will be test plant, because of its high sensitivity to inhibition by allelochemicals and reliability for germination. In sandwich method, the radicle lengths of dry material treated lettuce seeds and control lettuce seeds will be measured and inhibition of radicle elongation will be determined. Lettuce seeds will also be treated by the methanol extracts of dry hazelnut parts to calculate EC<sub>50</sub> values, which are required to induce half-maximal inhibition of growth, as mg dry weight equivalent mL<sup>-1</sup>. Inhibitory activity of extracts against lettuce seedling elongation will be evaluated, like in sandwich method, by comparing the radicle lengths of treated seeds with that of control seeds and EC<sub>50</sub> values will be determined. Research samples are dry parts of Turkish hazelnut, *C. avellana* L. The results would suggest the opportunity for allelopathic potential of *C. avellana* L. with its byproducts in plant-plant interaction, might be utilized for further researches, could be beneficial in finding bioactive chemicals from natural products and developing of natural herbicides.

**Keywords :** allelopathy, *Corylus avellana* L., EC<sub>50</sub>, *Lactuca sativa* L., sandwich method, Turkish hazelnut

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