

Allelopathy Encyclopedia Article

Allelopathy

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Allelopathy

Allelopathy describes those situations and events where chemicals produced by higher plants, algae, fungi, or microorganisms cause some effect, either inhibitory or stimulatory, on other members of the plant or microbial **community**. Unlike competition for a resource, the central principle in allelopathy arises from the fact that plants and microorganisms collectively produce thousands of chemicals, and many of these chemicals are released from the producing organism by leaching, **exudation**, **volatilization**, or decomposition processes. Subsequently, some of these **compounds** (known as allelochemicals) alter the growth or **physiological** functions of organisms that encounter them during growth. For example, almost pure droplets of sorgoleone (a quinone) are exuded from the roots of *Sorghum* species, and sorgoleone inhibits growth in plants that contact it by blocking photosynthesis and respiration. While the word "allelopathy" was first used in the 1930s, the phenomenon that it describes was suggested by natural philosophers more than two thousand years ago as they observed that some plants did not grow well near other kinds of plants.

Research conducted in the last half of the twentieth century demonstrated cases of growth inhibition by allelochemicals that influenced vegetational patterns, rate and sequences in plant succession, weed abundance, crop productivity, and problems in replanting fruit and other crops. Investigators have focused on identifying the producing plants and the chemicals they give off, the physiological effects on receiving species, and how climatic and soil conditions change the action of allelochemicals. Cinnamic and benzoic acids, **flavonoids**, and various terpenes are the most commonly found allelochemicals, but several hundred chemicals have been identified, including many other classes of secondary plant compounds. A few allelo-chemicals have been developed as herbicides and pesticides, and it may be possible to genetically engineer a crop to produce its own herbicides.

See Also

Flavonoids; Interactions, Plant-Plant.

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