

Paraquat Resistance of Weeds – the Case of *Conyza canadensis* (L.) Cronq

Zoltán Szigeti*, Ilona Rácz and Demeter Lásztity

Eötvös Loránd University, Department of Plant Physiology, H-1445 Budapest, P. O. B. 330, Hungary. Fax: (36) 1 266 0240. E-mail: bioszigeti@ludens.elte.hu

* Author for correspondence and reprint requests

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The paper gives an overview of literature on paraquat resistance of weeds and the proposed mechanism of resistance. New results we achieved on horseweed (*Conyza canadensis* /L./, Cronq.) are discussed in detail.

It was demonstrated that there is no significant constitutive difference related to the paraquat resistance between untreated susceptible and paraquat-resistant horseweed plants. The lower sensitivity of flowering resistant plants may be due to the fact that paraquat content in treated leaves of flowering resistant plants was only 25% as compared to those measured at rosette stage. Our results confirm that paraquat resistance is not based on elevated level and activity of antioxidant enzyme system. The hypothesized role of polyamines in the resistance mechanisms can be excluded. The higher putrescine and total polyamine content of paraquat treated resistant leaves can rather be regarded as a general stress response, than as a symptom of paraquat resistance. A paraquat-inducible protein is supposed to play a role in the resistance, which presumably functions by binding paraquat to an inactivating site and/or by carrying paraquat to metabolically inactive cell compartment (vacuole, cell wall). From model experiments it is concluded that paraquat and diquat preferentially form hydrophylic interactions with proteins containing a higher amount of lysine and glutamic acid. Consequently, the reason for paraquat resistance in horseweed is probably a hydrophylic interaction of paraquat with a protein, leading to inactivation of paraquat through forming a conjugate and/or sequestration into the vacuole or the cell wall.