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ANALYSIS OF THE EXPRESSION AND REGULATION, BY PHYTOHORMONES, OF UREASES IN SOYBEAN PLANTLETS

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Ureases are nickel-dependent metalloenzymes, that catalyze the hydrolysis of urea into ammonia and carbon dioxide. Found in plants, bacteria and fungi. In plants, besides their involvement in the metabolism and bioavailability of nitrogen, ureases play role in the defense against phytopathogens, mainly fungi and bacteria. Little is known about urease regulation in plants and, besides its catalytic ability, probably act as a plant defense protein. In legume *Canavalia ensiformis* a family gene of ureases has been shown to be induced by abscisic acid, a phytohormone that is responsive to stress. In this study, we evaluated the urease genes expression, under phytohormones application, herbivory and mechanical damage by MecWorm. Soybean seeds cv. Williams 82 were germinated and maintained in a growth chamber until the appropriate stage for the assays. Plant morphology assays, kinectics studies, phytohormone application, herbivory with *Spodoptera littoralis* and mechanical damage caused by MecWorm were performed. Ureolytic activity and transcripts for the ubiquitous urease, embryo-specific urease and UreG were quantified. An increase in the ubiquitous urease transcripts, upon jasmonic acid application was found; increase of embryo-specific urease transcripts upon abscisic acid application and, UreG transcripts upon treatment with jasmonic acid. The ubiquitous urease was upregulated after herbivory treatment and downregulated after MecWorm treatment. The UreG transcripts were downregulated after MecWorm, *Spodoptera littoralis* and exogenous application of gibberelic acid. Roots and leaves showed the highest values of ubiquitous urease transcripts. When treated plants were compared to control plants, the ureolytic activity of excised leaves was not influenced by phytohormones treatments nor by herbivory and MecWorm stresses. We conclude that the enzymatic activity of ureases, involved in nitrogen recycling and metabolism, is "constitutive" and basal levels of the enzyme are enough to perform these functions. On the other hand, the defense role of ureases, which does not require the enzyme's activity, may have a differential regulation in response to distinct types of stress.

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