

Changes of Redox Activity during the Development of Rape

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Redox activity was measured in vegetative and generative apical parts (5 mm of the stem) and youngest leaves of winter (cv. “Górczański”) and spring (cv. “Młochowski”) rape. Both genotypes were cultured under the same growth conditions (17/15 °C day/night, 16 h photo-period), but winter rape was additionally vernalized (5/2 °C day/night, 56 days) in order to induce the generative development. The cyclic voltammetric method was used to measure the redox potential of samples in the presence of Fe³⁺ ions. Changes in the redox activity were compared with changes in riboflavin content and activities of antioxidative enzymes: superoxide dismutase (SOD) and catalase (CAT). The higher level of Fe³⁺ ions and riboflavin detected in generative apices and leaves of winter and spring varieties indicated that electrons (and their donors) were present at a lower level in these organs in comparison with the vegetative ones. On the contrary, SOD and CAT activity were lower in generative than in vegetative organs. This confirms changes in the redox balance and involvement of oxygen radicals in the generative development of rape plants. The similarity of the measured parameters between winter and spring varieties indicates that the observed changes are independent of the way of generative induction (vernalization). Riboflavin can serve as one of the electron carriers between other oxidation-reduction substances.

Key words: Redox Activity, Generative Development, Rape