

Enhancement of Hydrogen Peroxide through Photooxidative stress in *Eruca sativa* L.

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The rocket (*Eruca sativa* L.) is a medicinal herb belonging to family Brassicaceae which highly consist of antioxidant, anticancer properties, reducing risk of cardiovascular and cognitive disease. Despite the medicinal importance, Avicenna, farther of Unani medicine considers that the air rise from the fields of vegetables, particularly those in which cabbage and rocket seeds (Jirjir) are grown, is unfit for inhalation. In this regard, we examine the current knowledge on plant photoprotective measures at high light intensities, triggering biosynthesis of toxic photo products in response to stress. Plants receive light energy as photons which use for driving photosynthetic process. However, the excess photons captured are rapidly dissipated as heat by photochemistry to avoid over excitation of chlorophyll molecules. Once this process delays, excited chlorophylls interacts with oxygen molecules and form an extremely reactive singlet oxygen (1O_2) and other classes of reactive oxygen species (ROS) such as superoxide (O_2^*), hydrogen peroxide (H_2O_2), hydroperoxyl radicals (HO_2) and hydroxyl radical (OH^*) which cause photo oxidative stress by damaging membrane lipids, protein and nucleic acids. Although, to alleviate such situations, carotenoids and xanthophyll play role in photoprotective mechanisms eliminates ROS by re-scavenging enzyme activities viz; superoxide dismutase and ascorbate peroxides. However, the imbalance between the production of ROS and antioxidant defence has been reported in rocket plants. In recent studies, it has been revealed that H_2O_2 is excessively synthesised in tissues when exposed to stress condition. Moreover, the alveolus functions are impaired by ROS in premature and new born babies. Hence, these findings partly validate the Avicenna's theory.

Key words: *Eruca sativa* L., photooxidative stress, reactive oxygen species, hydrogen peroxide, premature and new born