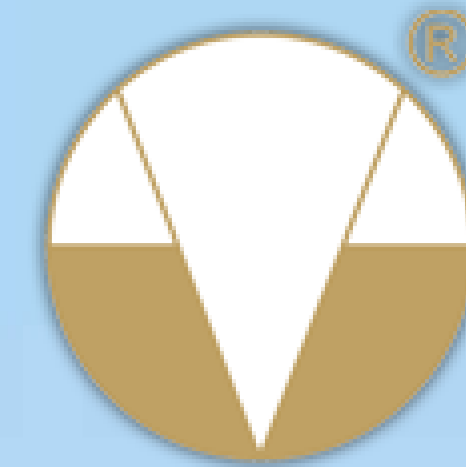


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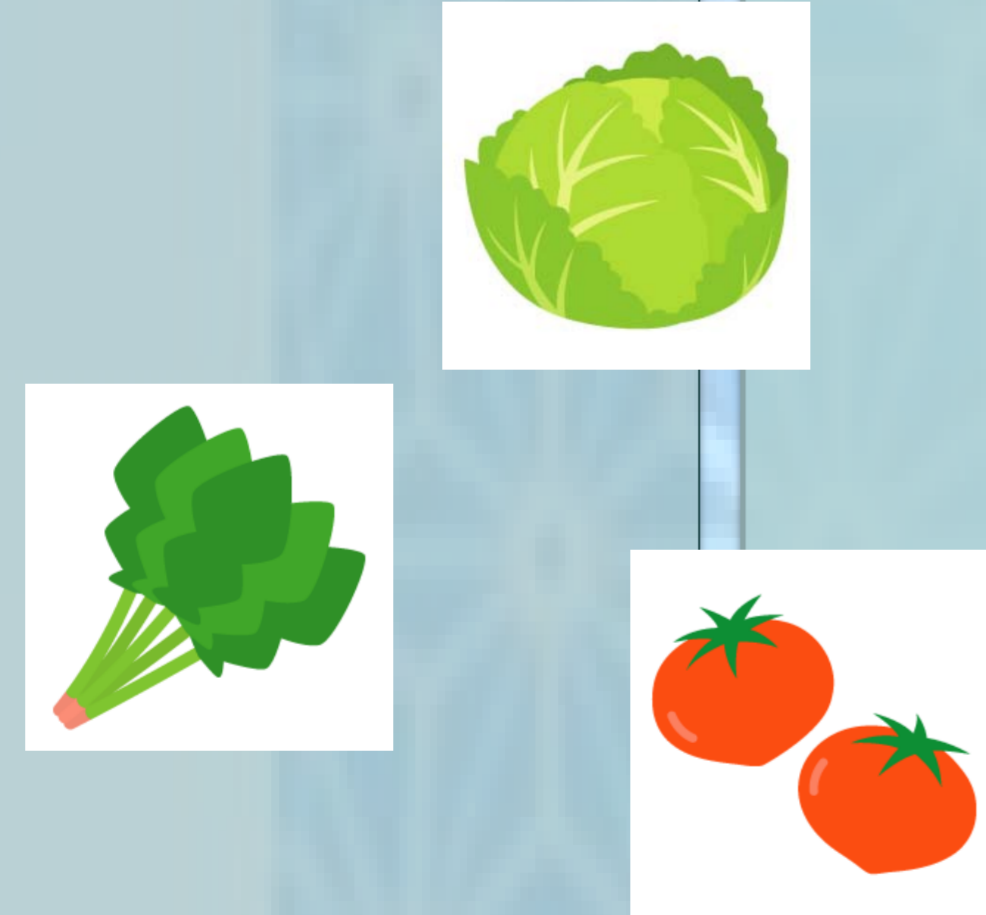
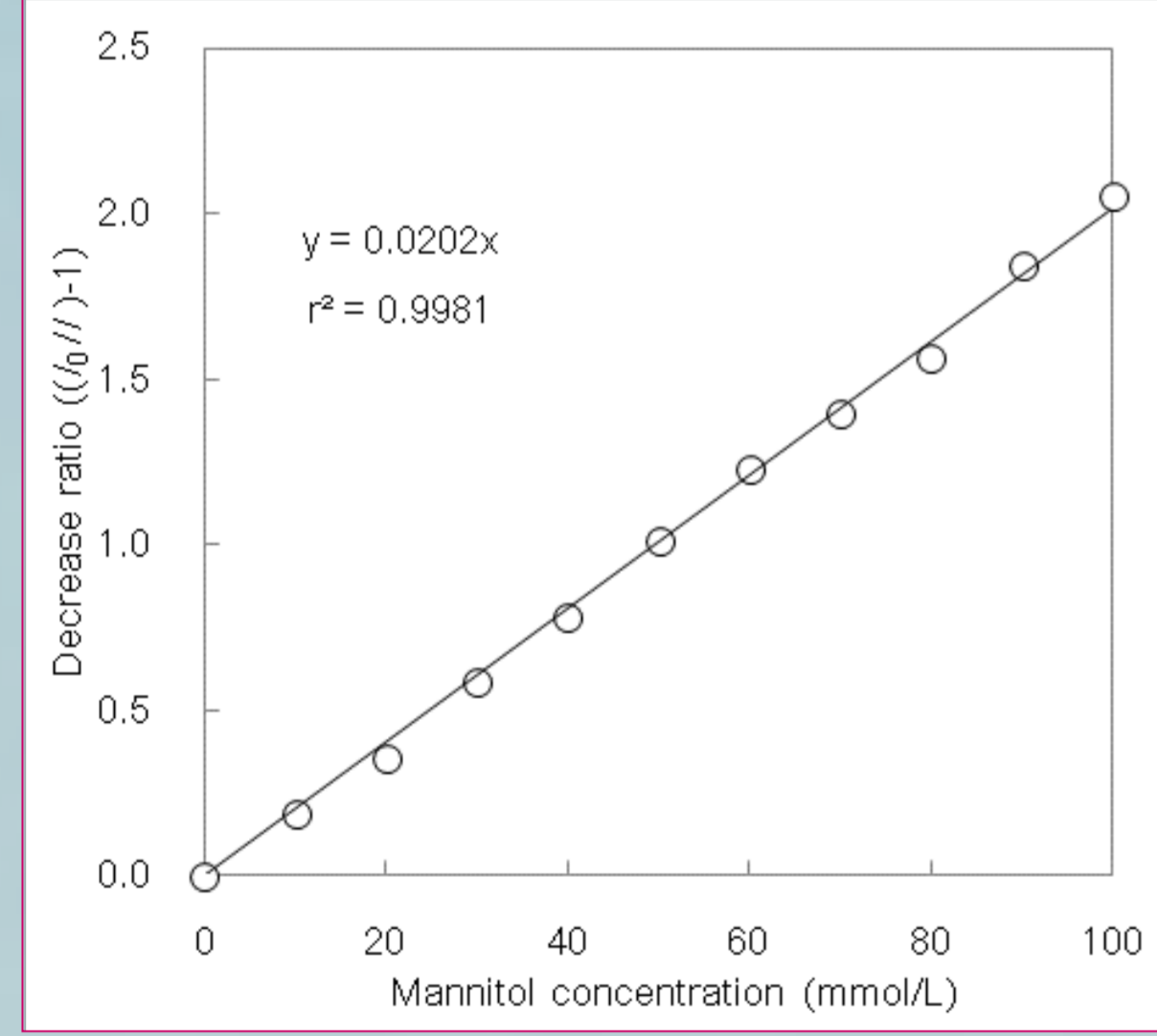
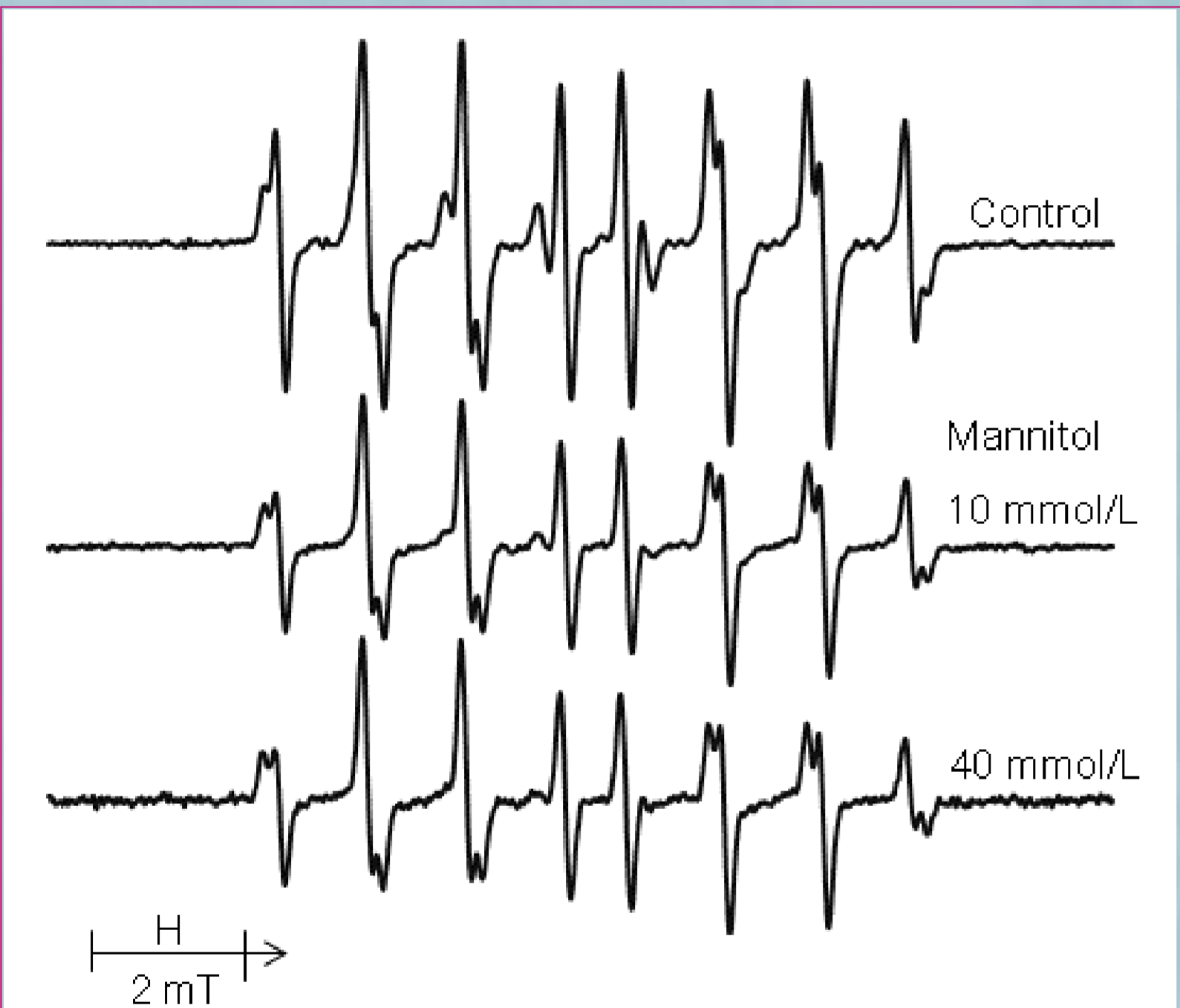
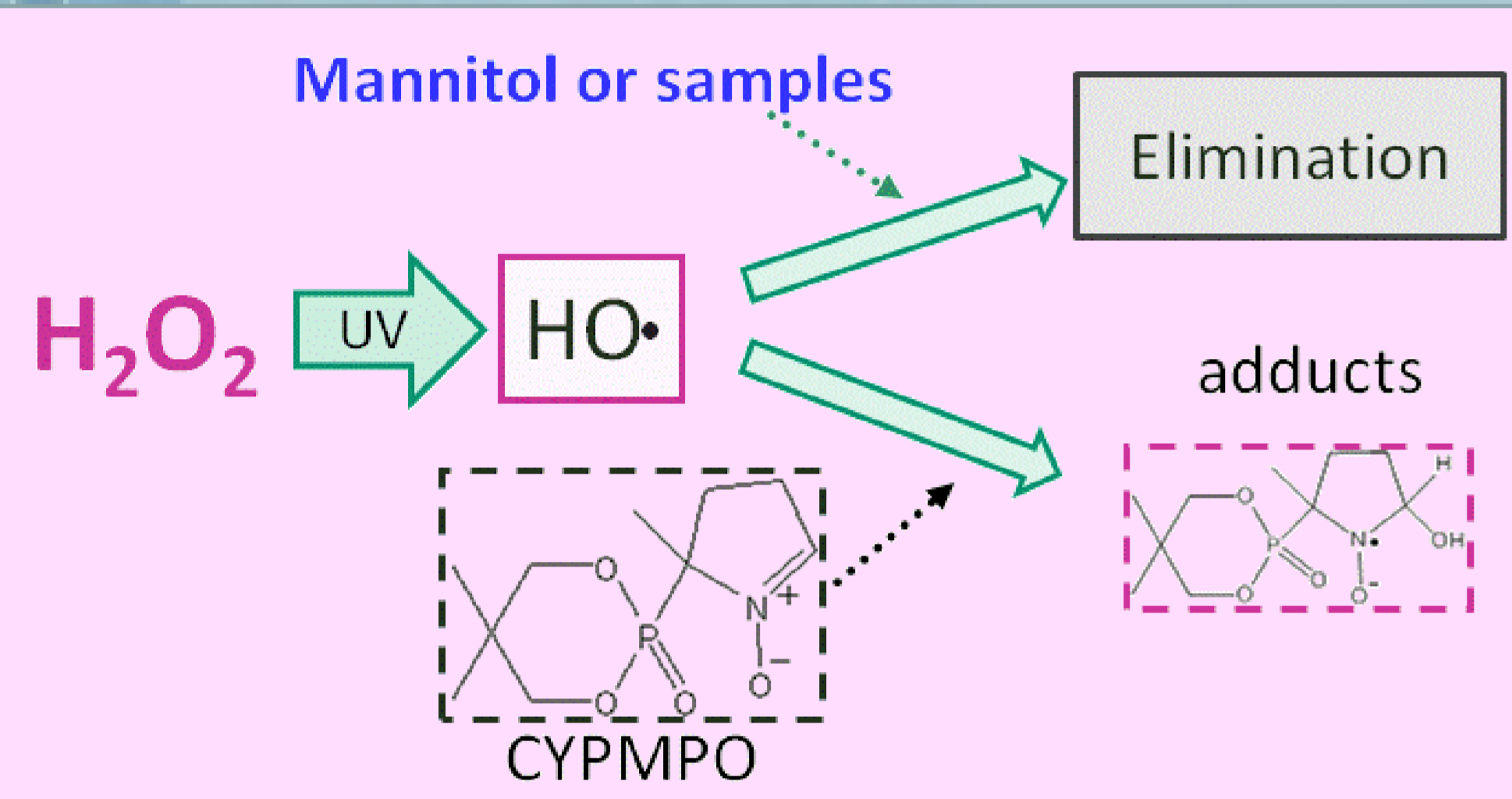
EVALUATION OF MULTIPLE RADICAL SCAVENGING CAPACITIES USING ESR



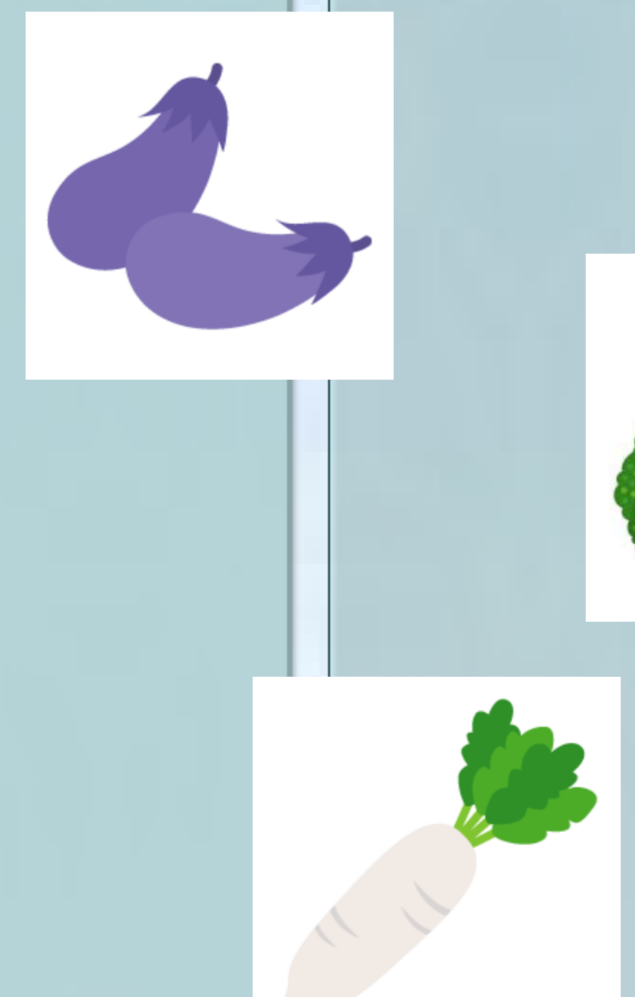
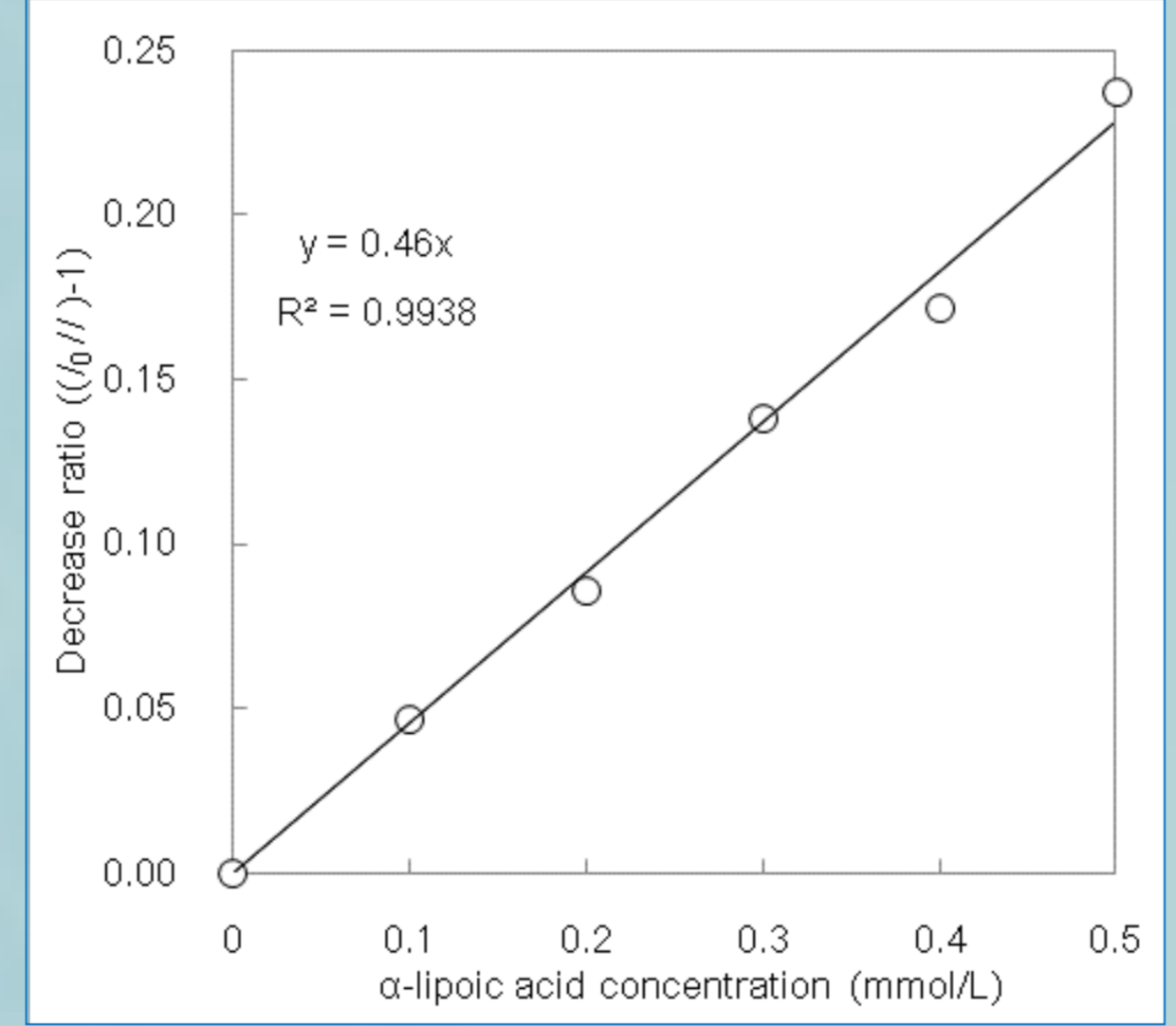
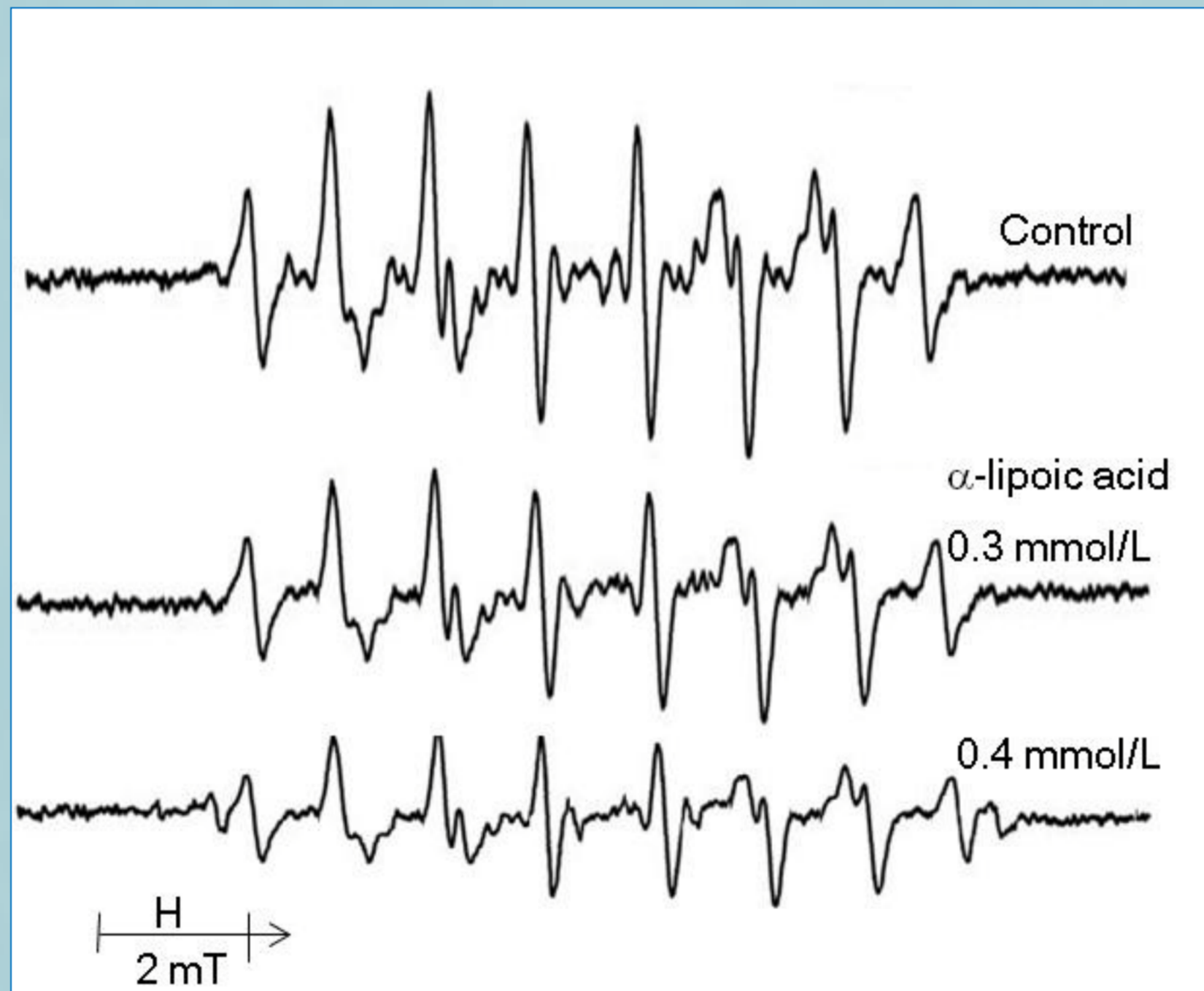
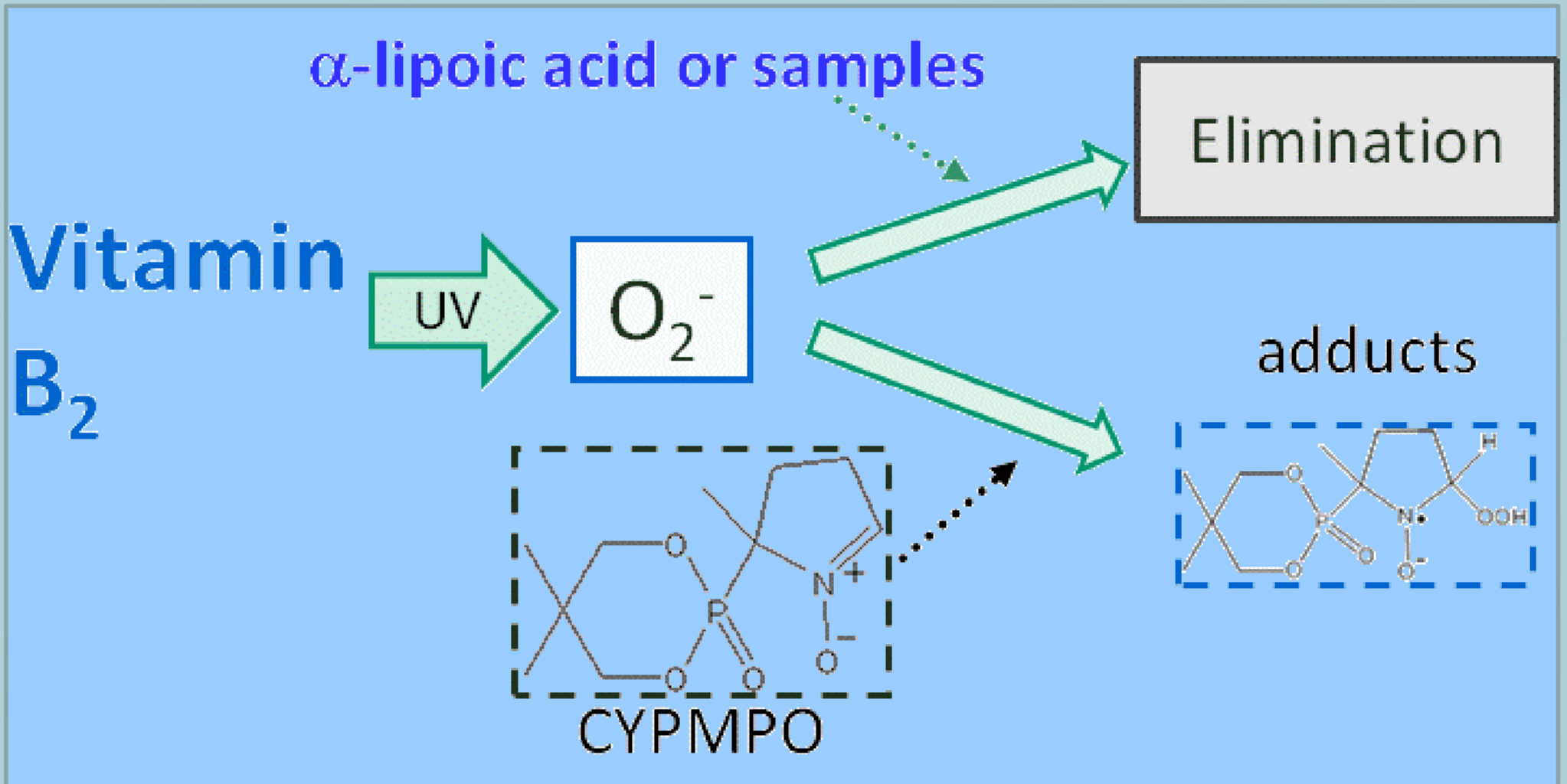
Hiromi Kameya, Jun Watanabe, Yuko Ishikawa, Setsuko Todoriki
National Food Research Institute Japan

Vegetables are known to contain large quantities of antioxidants, which inhibit reactive oxygen species (ROS)-induced decomposition of biological molecules. It is necessary to directly measure the scavenging capacity of each ROS for evaluating the total scavenging capacities of foods. In this study, we have developed an ESR spin trapping method that utilizes the same photolysis procedure to enable analysis of the scavenging capacities of food samples such as vegetable extracts for multiple ROS (hydroxyl, superoxide, alkoxy radical, and singlet oxygen). Optimal conditions were determined for the effective evaluation of the scavenging capacity of multiple ROS. The optimized ESR spin-trapping method was used to analyze the scavenging capacities of 54 different vegetable extracts for multiple ROS. The quantification of radical adducts was found to be highly reproducible, with variations of less than 4%. We concluded that the multiple ESR spin-trapping method is very useful for thermally unstable specimens such as vegetable extracts.

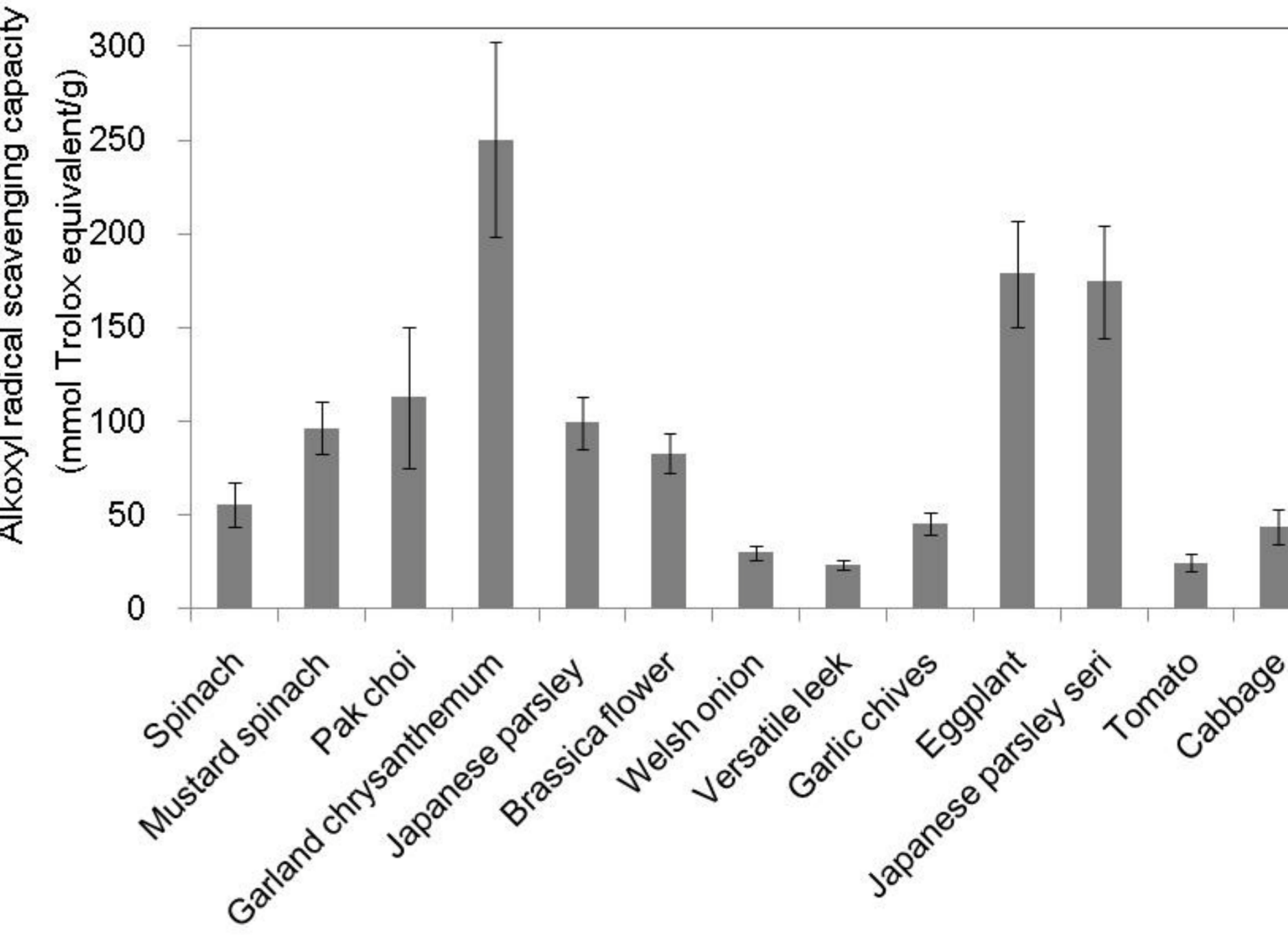
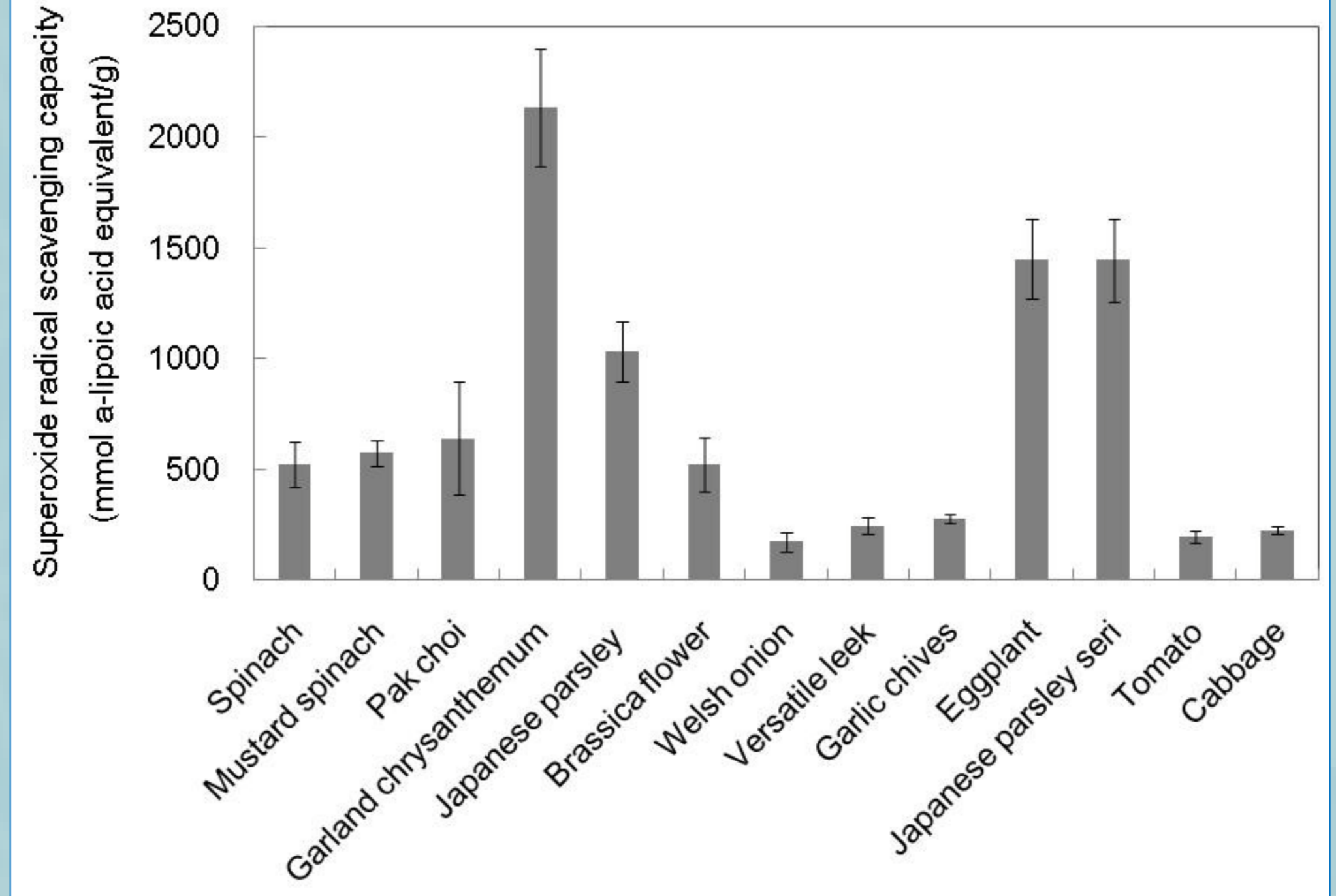
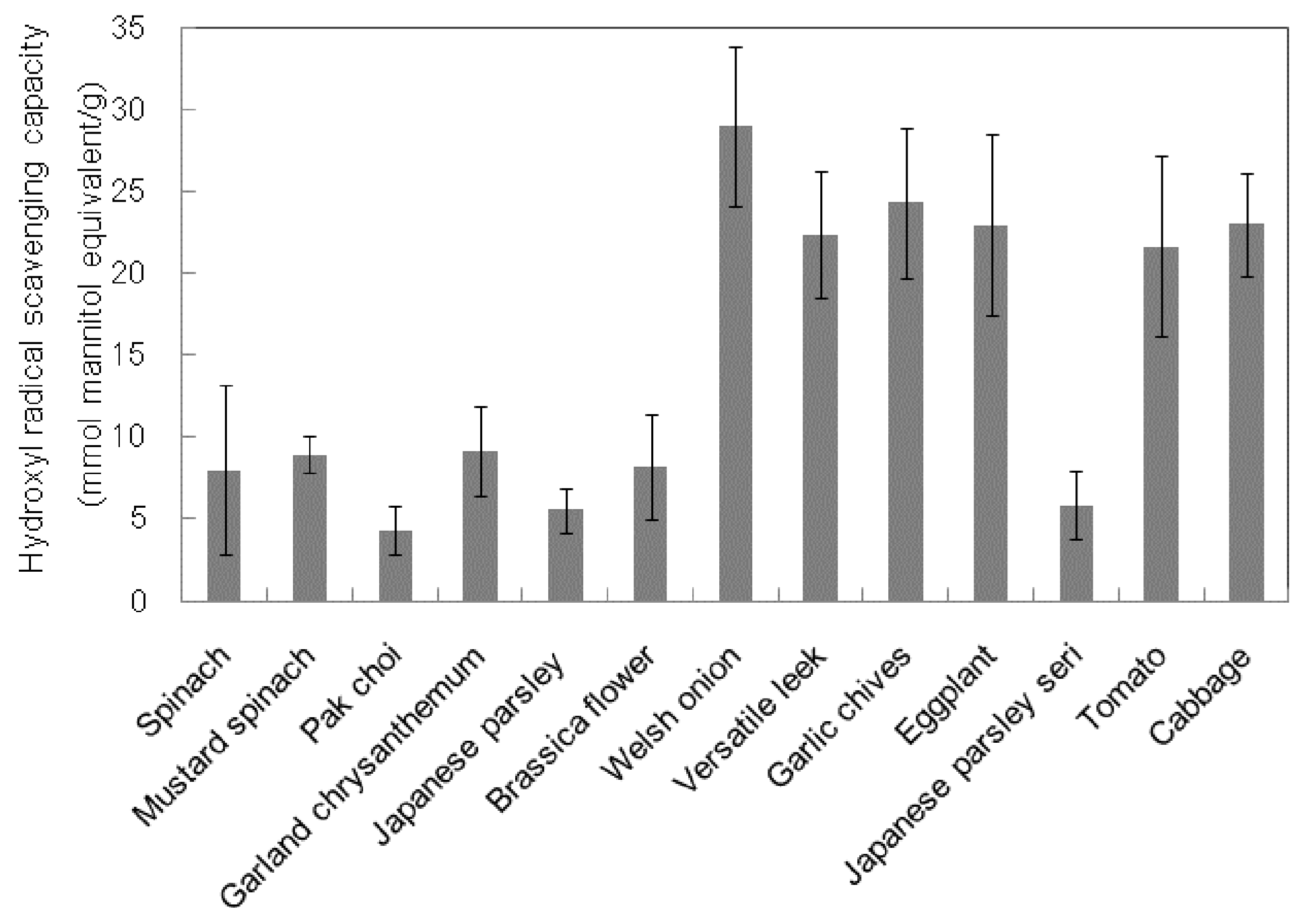
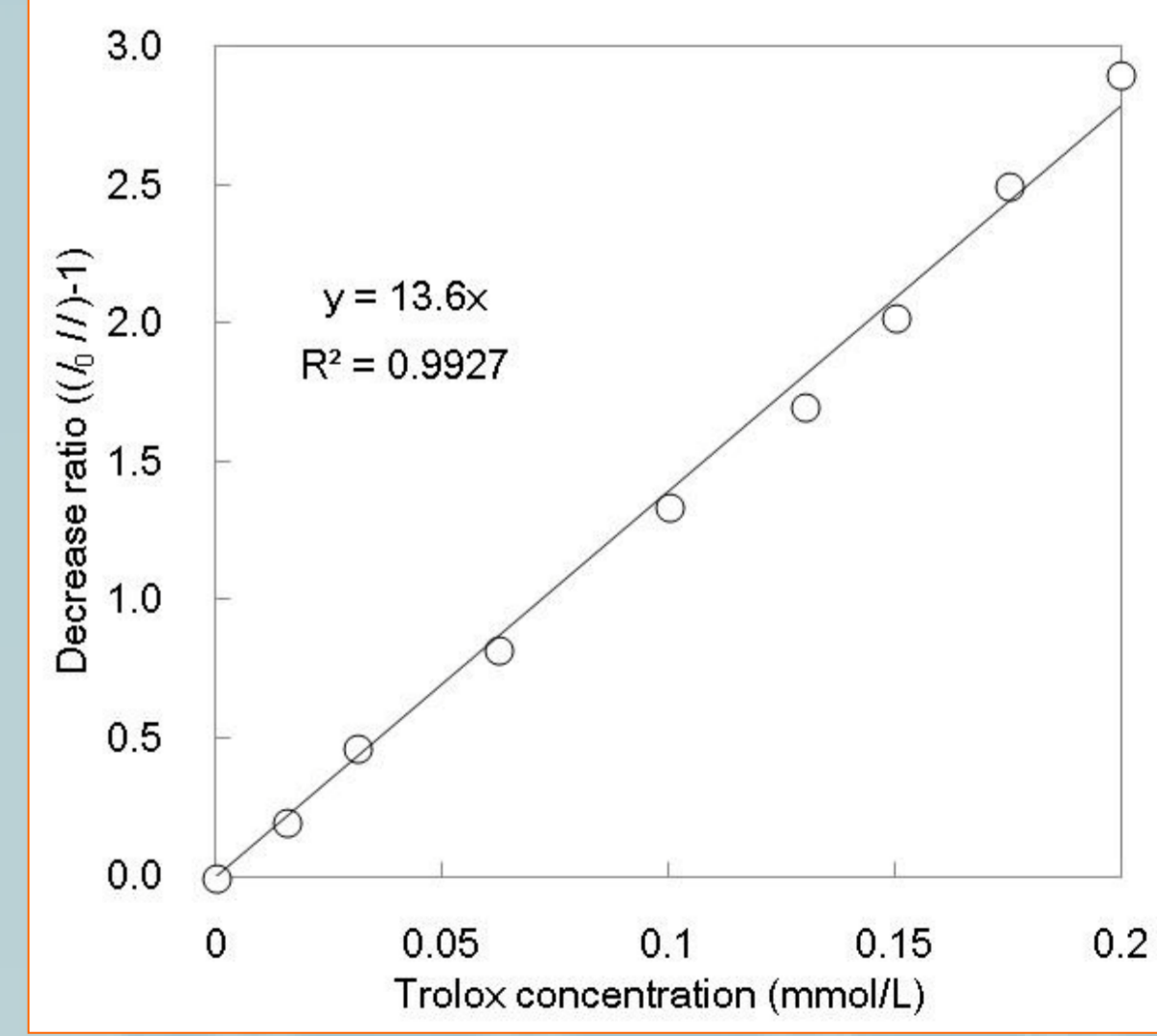
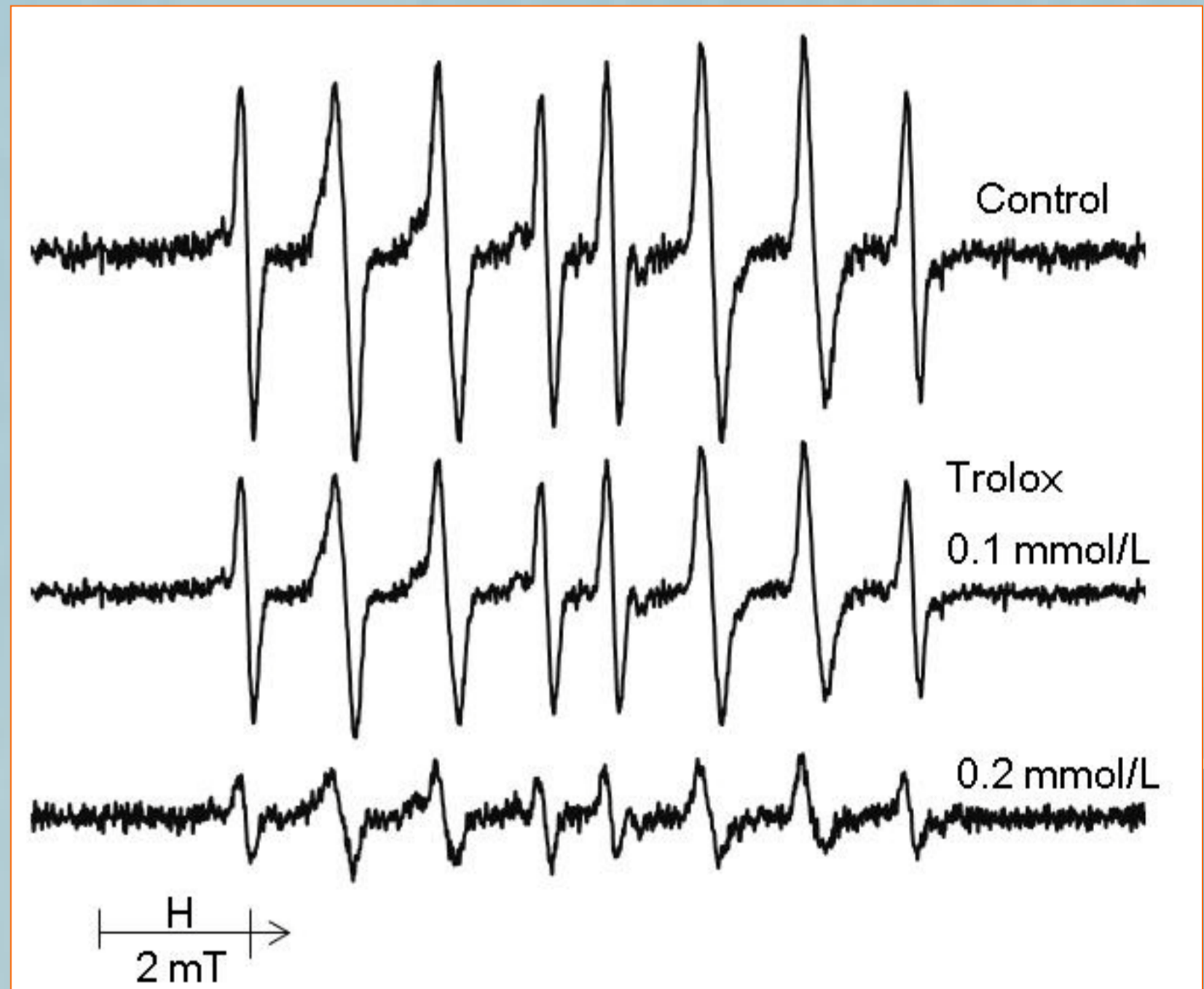
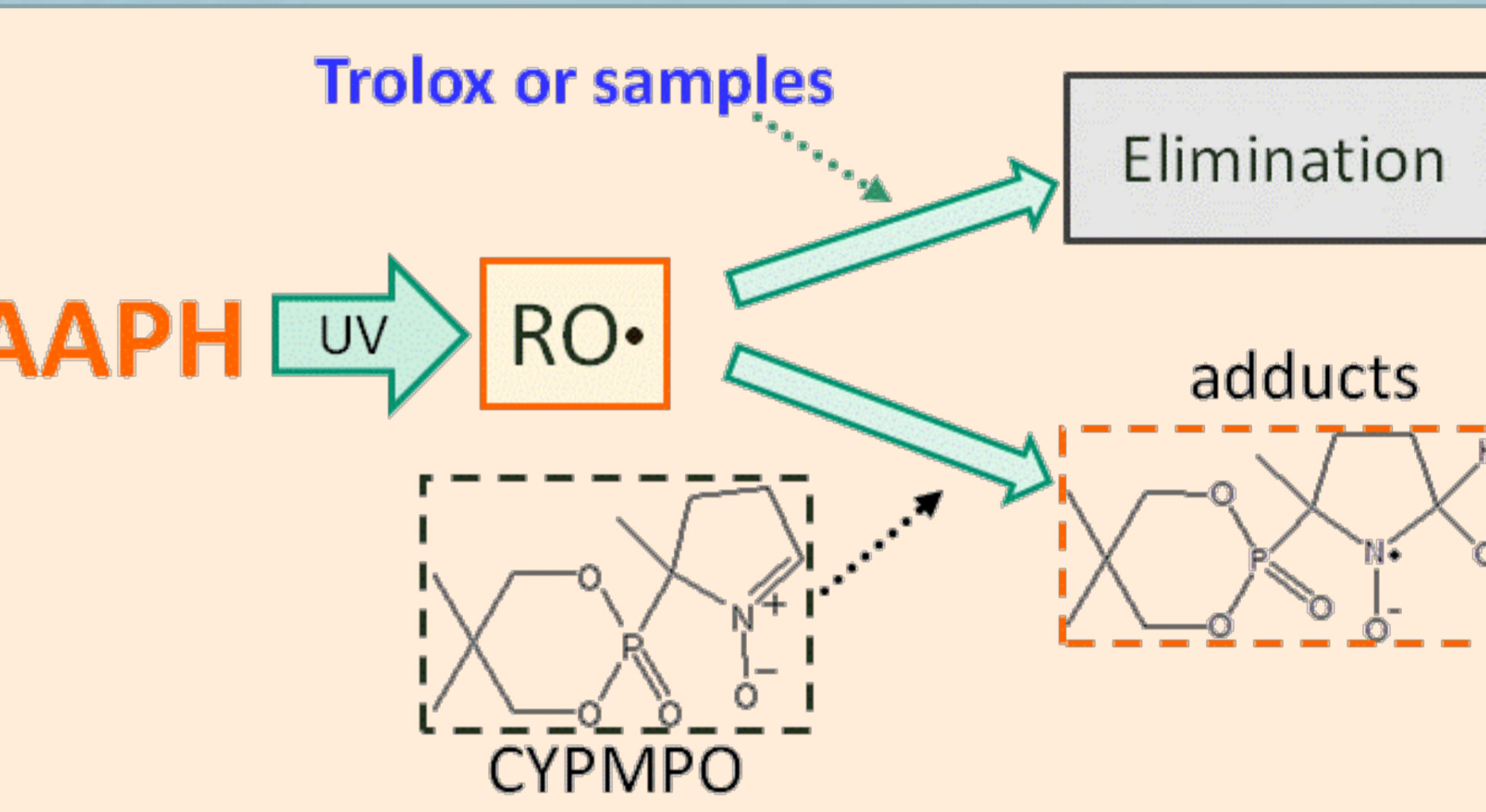
Hydroxyl radical scavenging capacity



Superoxide radical scavenging capacity



Alkoxy radical scavenging capacity



References

M. Ukai and H. Kameya, Food Sci. Technol. Res., 15 (6), 619 – 624, 2009. H. Kameya et al., Food Chem., 145, 866–873, 2013. H. Kameya and M. Ukai, J. Mater. Sci. Engineer., 1, 347-351, 2011