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Assessment of the use of biomarkers in aquatic plants for the evaluation of environmental quality: application to seagrasses

L. Ferrat [a,*], C. Pergent-Martini [a], M. Roméo [b]

[a] *EqEL, University of Corsica, BP 52, 20250 Corte, France*
[b] *R.O.S.E., University of Nice Sophia Antipolis, UMR INRA UNSA 1112, Parc Valrose, BP 71, 06108 Nice, France*

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Abstract

The use of aquatic plants as bio-indicators constitutes an irreplaceable tool for investigation in ecological research, applied to the conservation of littoral ecosystems. Today, studies in both the laboratory and the field have provided encouraging insights into the capacity of aquatic plants to act as biomonitors of environmental quality, through the use of biomarkers, and these are reviewed here. Photosynthetic activity, secondary metabolites, heat shock proteins, enzymes of detoxication, and oxidative stress biomarkers were measured in the case of various stressors, (e.g. light, thermal, hydric/haline stress, or herbicides, metals, organic contaminants). Most of them seem to be valuable and early markers of the environmental conditions, as demonstrated by experimentations carried out on *Posidonia oceanica*. Nevertheless, none can be in itself a valuable solution, and only a multiparametric approach, including both 'physiological' biomarkers, biomarkers of general stress and more specific biomarkers seems to be appreciable in an ecotoxicological diagnostic.

Keywords: Aquatic plants; Biomarkers; Oxidative stress; Detoxication; Glutathione *S*-transferase; Phenolic compounds

* Corresponding author. Tel.: +33-495-45-0146; fax: +33-495-46-2441.
E-mail address: ferrat@univ-corse.fr (L. Ferrat).

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