Title	**Phenolic compounds and antioxidant properties in the snow alga Chlamydomonas nivalis after exposure to UV light**
Author	Brian Duval,Kalidas Shetty and William H. Thomas
Journal	Journal of Applied Phycology
Abstract	The snow alga Chlamydomonas nivalis was collected from the Sierra Nevada, California, USA, and examined for its ability to produce phenolic compounds, free proline, and provide antioxidant protection factor in response to UV-A and UV-C light. Exposure of C. nivalis cells to UV-A light (365nm) for 5 days resulted in a 5–12% increase in total phenolics, where as exposure to UV-C light (254 nm) resulted in a 12–24% increase in phenolics after 7 days of exposure. Free proline was not affected by UV-A, but increased markedly after UV-C exposure. A three-fold increase in free proline occurred within two days after exposure to UV-C, but then dropped as cells became bleached. Antioxidant protection factor (PF) increased after treatment of cells with UV-A and remained constant throughout UV-C exposure. Spectral analysis of algal extracts revealed a decrease in absorption in the 215–225 nm region, short-term (2day) stimulation of pigment at 280 nm, and an increase in carotenoids (473 nm), after exposure to UV-A. Snow alga exposed to UV-C light had a different spectrum from that of UV-A exposed cells, i.e. an enhancement of three major peaks at 220, 260, and 280 nm, and loss of absorption in the carotenoid region.We report that UV light exposure, especially in the UV-C range, can stimulate phenolic-antioxidant production in aplanospores of C. nivalis effecting biochemical pathways related to proline metabolism.
Year	2007
Pages	559- 566
keywords	

Title	**Oxidative Burst and Related Responses in Biotic Interactions of Algae**
Author	Philippe Potin2
Journal	Algal Chemical Ecology
Abstract	Herbivores and pathogens can have strong effects on algal fitness, regulate population dynamics, and cause considerable damage in marine ecosystems. This was exemplified in kelp forests by dramatic changes associated with the reduction or extinction of local populations of some key predators controlling macroalgal grazers (Estes and Duggins 1995), or in coral reef ecosystems, where coralline lethal orange disease (CLOD), a disease affecting various coralline algae, has led to the destruction of thousands of kilometers of reefs (Littler and Littler 1995). Such diseases or predation may also be highly destructive in managed ecosystems, as reported for Laminaria japonica (Ishikawa and Saga 1989), Porphyra yezoensis (Fujita et al. 1972), and Eucheuma/Kappaphycus (Ask and Azanza 2002; Hurtado et al. 2006) aquaculture fields. In the context of global change, including human impacts and introduction of alien species, the frequency of pathogens and epidemics has increased in recent decades and sessile invertebrate and algal populations will have to adapt their defense strategies to cope with new challenges (Harvell et al. 1999, 2002; Mydlarz et al. 2006). Marine algae have evolved a variety of defensive mechanisms against

	grazers and pathogens (Pohnert 2004). They strongly depend on their chemical repertoire to influence interactions with other organisms and with the environment. A portion of these chemicals may provide constitutive barriers against grazers or parasites. Constitutive production of secondary metabolites provides antimicrobial compounds (see Chap. 11; de Nys and Steinberg 2002; Kubanek et al. 2003) and grazer deterrents (see Chaps. 2–6, 9; Paul and Puglisi 2004; Paul et al. 2006c). Considering the fundamental question of the investment of physiological resources in defense structures or metabolites (see Chap. 7; Amsler and Fairhead 2006; Ianora et al. 2006), however, it is obvious that marine algae have also developed activated and induced defense mechanisms. Nonetheless, in striking contrast with the knowledge on host-pest interactions in terrestrial crop or wild plants (e.g., Nürnberger et al. 2004), very little is known about signaling or defense induction and regulation in marine algae (Bouarab et al. 2001a; Potin et al. 2002).
Year	2007
Pages	245- 271
keywords	