

Faculty of Science

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Title: Impact of UV-B radiation on antioxidant enzymes and protein electrophoretic pattern of the green alga chlorococcum sp.

Authors: Ate Mohamed Abou-Shady, Mostafa Mohamed El Sheekh; Amal Hamed El-Naggat & Abdel Fatah Ibrahim Abo-Mohra

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Abstract:

The impact of two intensities (2.5 and 5 W m⁻²) of ultraviolet-B (UV-B) radiation on lipid peroxidation, protein pattern and some antioxidant enzymes including superoxide dismutase, catalase and peroxidase has been studied in Chlorococcum-sp. Isolated from El-Kased freshwater canal. Tanta, Egypt. Exposure of Chlorococcum-sp. For 2h to 2.5 and 5 W m⁻² increased malondialdehyde (MDA) content by 238 and 274% respectively. The activity of superoxide dismutase and peroxidase were increased at all exposure times at both intensities. In contrast, the activity of catalase was inhibited by increasing UV-B intensity as well as exposure time compared to the control. The reduction in catalase activity reached 71.8 and 95.9% after 2 h of exposure to 2.5 and 5 W m⁻², respectively. With regard to protein pattern, exposure of Chlorococcum sp. To UV-B stress induced marked changes in protein synthesis patterns. Three types of alterations were noticed, i) significant reduction in the biosynthesis of certain protein, ii) induction of specific proteins biosynthesis and iii) changes in band intensities of some proteins.

Key words:

Antioxidant enzymes, chlorococcum sp., lipid peroxidation, oxidative stress, protein pattern, ultraviolet-B radiation.

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Authors: Afef Mohamed Abo Shady, Amal Hamed El Naggar, Mostafa Mohamed El Sheekh, Abd El Fatah Abomohra

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Abstract:

The impact of two intensities (2.5 and 5 w m⁻²) of ultraviolet-B (UV-B) radiation on lipid peroxidation, protein pattern and some antioxidant enzymes including superoxide dismutase, catalase and peroxidase has been studied in Chlorococcum sp. Isolated from El-Kased freshwater canal, Tanta, Egypt. Exposure of Chlorococcum sp. For 2h to 2.5 and 5 w m⁻² increased malondialdehyde (ADM) content by 238 and 264% respectively. The activity of superoxide dismutase and peroxidase were increased at all exposure times t both intensities. In contrast, the activity of catalase was inhibited by increasing UV-B intensity as well as exposure time compared to the control. The reduction in catalase activity reached 71.8 and 95.9% after 2 h of exposure to 2.5 and 5 W m⁻², respectively. With regard to protein pattern, exposure of Chlorococcum sp. To UV-B stress induced marked changes in protein synthesis patterns. Three types of alterations were noticed, i) significant reduction in the biosynthesis of certain proteins, ii) induction of specific proteins biosynthesis and iii) changes in band intensities of some proteins.

Key words:

Antioxidant enzymes, Chlorococcum sp., lipid peroxidation, oxidative stress, protein pattern, ultraviolet-B radiation.