

***In vitro* Antioxidant Capacities of Two Benzonaphthoxanthrones:
Ohioensins F and G, Isolated from the Antarctic Moss
*Polytrichastrum alpinum***

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Antioxidant agents against reactive oxygen species can be used for several cosmetic and medicinal applications. This study's objective was to evaluate the antioxidant activities of *Polytrichastrum alpinum* (Hedw.) G. L. Sm. (Polytrichaceae), an Antarctic moss species collected from King George Island (Antarctica). The identification of the moss species was performed on the basis of morphological characteristics and molecular sequencing of the 18S rRNA gene. Two benzonaphthoxanthrones: ohioensins F and G, were isolated from the extract after several chromatographic procedures. The various *in vitro* antioxidant capacities of a methanolic extract of *P. alpinum* and the isolated compounds were evaluated by analyzing the scavenging capacities of free radicals of 2,2-azino-bis(3-ethylbenzthiazoline-6-sulfonic acid) (ABTS) and 2,2-diphenyl-1-picrylhydrazyl (DPPH), the total phenol assay with Folin-Ciocalteu reagent, the ferric ion (Fe³⁺) reducing power and the nitric oxide (NO) scavenging activity and compared to those of commercial standards for each assay. The experimental data showed that even the crude extract of *P. alpinum* exhibited potent antioxidant activity. The antioxidant activity was increased two- to seven-fold for the purified compounds. The antioxidant activities of both purified compounds were found to be more or less the same in all experiments. However, the obtained data showed that the Fe³⁺ reducing power of the purified compounds and crude methanolic extract was almost the same suggesting the presence of other stronger reducing agents in the methanolic extract which could not be isolated in the present experiment. Therefore, further work on the isolation of these stronger antioxidant agents from this moss specimen of the extreme environment is warranted. Developments of laboratory mass culture techniques are anticipated to achieve bulk production of the active constituents for commercial application.

Key words: ABTS, DPPH, *Polytrichastrum alpinum*, Nitric Oxide