Different studies already demonstrated a direct relationship between the seaweed's consumption and the prevention and/or improvement in the treatment of diseases related to oxidative stress. Algae have been used, therefore, in the investigation of bioactive compounds, aimed at developing new medicines and health foods. This paper presents the results of analyzes of the contents of Vitamin C, Vitamin E, Fucoxanthin, Chlorophyll a, Pheophytin a, Lutein, Beta-carotene by HPLC; Polyphenols by the Folin-Ciocalteu and Antioxidant Activity by DPPH assay in Himanthalia elongata dehydrated, hydrated by immersion, boiled and steamed. The values are the average ± standard deviation for 6 samples, expressed in mg/kg of dry matter and Antioxidant Activity in μM Trolox/ kg d.w. Comparing different culinary treatments with dry's samples, hydration by immersion presented the higher results in every analyzed compounds: Antioxidant Activity (20043.9±8386.3), Polyphenols (3963.0±1416.0), Fucoxanthin (106.0 ±21), Lutein (4.6±2.2) and Beta-carotene (17.3± 5.1); except for Pheophytin a (1536.0 ± 166.7). In addition, the hydration was the only one treatment that presented values of vitamin E (0.72 ± 0.4) and Chlorophyll a (236.0± 66.0). Vitamin C was not detected after cooking processing. The multiple correlation coefficient between the antioxidant activity's values and all the analyzed compounds showed a good correlation R2 of 0.95. The results presented contribute to better understanding the behavior of bioactive compounds when subjected to different cooking methods and reaffirm the potential of Himanthalia elongata as an ingredient for formulation of food and medicinal compounds.