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Efficiency of some algal extract and fungus *Serendipita indica* as growth performance stimulant on *Ocimum basilicum*

REHAB ABUDESHEH¹, AMAL ABOUL-NASR², MAYADA SABRA², HANAN KHAIRY¹

¹National Institute of Oceanography and Fisheries (NIOF), Marine Environmental Division, Egypt

²Alexandria University, Agricultural Botany Department, Egypt

Abstract

Plant biostimulants (PBs) have paramount significance in sustaining agricultural productivity and a healthy environment, which limits the use of chemical synthetic fertilisers that have adverse effects on terrestrial and marine ecosystems. PBs are used globally to increase crop yield and productivity and comprise substances and/or microorganisms used to stimulate and enhance physiological processes in plants, such as those produced from *Serendipita indica* or algal extracts. The physiological, ecological and biochemical effects of *S. indica* or algal extracts (micro or macro) individually and in combination, on sweet basil plants (*Ocimum basilicum* L.) were investigated. Plant growth and photosynthetic performance were assessed. Lipid, nitrogen, phosphorus, sodium and potassium content were used to analyse biochemical impacts. In comparison to the control, all algal extracts and *S. indica* treatments demonstrated various enhancements in growth characteristics, physiological parameters and biochemical effects on *O. basilicum*. The combined treatments had a substantial higher influence on sweet basil than the individual treatments. *Chlorella vulgaris* increased *S. indica* colonisation by 66 % in our study; however, *Ulva lactuca* and *Padaina pavonica* inhibited *S. indica* colonisation by 80 % and 40 %, respectively. The evidence of synergistic/additive benefits to plant performance due to the interactive effects of *C. vulgaris* and *S. indica* as plant biostimulants has been studied. The complementary modes of action of *C. vulgaris* and *S. indica* as plant biostimulants may be responsible for the observed positive effects due to new and emerging properties of their components on sweet basil plants. These novelties will help create a second generation of plant biostimulants with integrated and complementary actions.

Keywords: Algal extract, *Chlorella vulgaris*, growth performance, *Padaina pavonica*, *Serendipita indica*, Sweet basil, *Ulva lactuca*