

P 1 . Effects of Deep Sea Water on Gondalbi(*Ligularia stenocephala*) Growth

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1. Introduction

Deep Sea Water (DSW) is found more than 200 m under the surface of the sea. As no sunlight reaches, no photosynthesis takes place, and it has very little organic matter and/or bacteria. It is a mineral-rich sea water resource that can be beneficially used in varied fields. Since the 1970s, scientists around the world have recognized the importance of DSW and have been conducting research into it. In the USA and Japan, DSW has been researched with the view of its application to cooling, alternative energy, farming and the development of new materials, however, it is only used in limited fields such as drinking water production and food processing etc. in Korea.

The leaves of *Ligularia stenocephala* are consumed as an edible vegetable and known as gondalbi in Korea. The genus *Ligularia* is usually treated as folk medicine for asthma, cough, arthritis and tuberculosis in some regions of eastern and western Asia. Gondalbi is a widely used fresh vegetable in Korea but is in short supply due to difficulties in cultivation and distribution. The purpose of this research was to evaluate the feasibility of DSW as a soil amendment and plant growth stimulators.

2. Materials and Method

After concentrating mineral water from DSW, lime and kelp extract were mixed to prepare liquid fertilizer. Pot experiments were conducted to evaluate the effects of DSW fertilizer (500 and 1000 times dilution) on the soil quality and crop growth compared to the control (not treated) and diluted DSW (5%, 10%). After transplanting the seedlings into the pot, the soil properties and plant growth were observed for 10 weeks.

3. Result

Inorganic nutrients (N, P, K, Ca, Mg etc.) in soils after applying the DSW fertilizer and diluted DSW were increased compared to the control. The growth and yield of plants were higher than those of the control and diluted DSW, however, for the soil treated with DSW fertilizer, the pH and EC did not increase compared to the control, but increased significantly when diluted DSW was used. Overall, processed DSW could increase the concentration of inorganic nutrients in soil and improve the plant quality. In conclusion, processed DSW can be utilized in farming fields as soil amendment and plant growth stimulator.