

Purification of Water by a Wild Strain of Water Dropwort (*Oenanthe javanica* DC)

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Introduction

Minari (water dropwort) is one of the important vegetables of Korean diet. It has been used for various vegetable dishes with raw or cooked condition and Kimchi, a fermented vegetable preservation, in Korea. Interest in water dropwort grown in hydroponic condition has arisen because of the possible use as fresh material for salad and green leaves juices.

In another view, water dropwort can live in serious polluted water. On the basis of this fact and general considerations, scientists have tried to find the ability of water dropwort to remove pollutants and chemical elements. This study was performed to investigate the possibility of water purification by a wild strain of water dropwort (*Oenanthe javanica* DC) planted in Korea.

Materials and Methods

A wild strain of water dropwort (*Oenanthe javanica* DC) was purchased from a hydroponist of water dropwort. Three commercially available dishwashing detergents and a standard surfactant, linear alkylbenzene sulfonate (LAS), were used for this study. The experiment was done in 1.5l translucent aquariums. The plants were distributed into various concentrations of detergents and various kinds of detergent in the separate aquariums. They were incubated in the aquariums under the natural condition, and changes of wet weights of the plants were determined. Determination methods for pH value, chemical oxygen demand and the concentration of detergents in the culture media followed the Official Methods of Korea.

Results and Discussion

The wet weight of the plants was significantly decreased ($p < 0.05$), and the visual vitality of the plants also decreased in 2 days. The higher the concentration of detergent was, and the more time the plants were exposed to the detergents, the more decrease of growth was observed. The pH value of the culture media decreased in 2 days and in 4 days, then slightly increased in 6 days. However, the pH value of the media did not return to the initial neutral level of pH in 6 days. The pH value of the

culture media containing the LAS solution remarkably increased in 6 days and increased to a neutral pH value in 18 days ($p < 0.01$) as the pH of the other culture media. The chemical oxygen demand (COD) of the culture media gradually increased over the 4 days. A decrease of COD was observed in 6 days, but no tendency was observed between 12 and 18 days. The detergent in the culture media was highly significantly decreased in 2 days ($p < 0.01$) and gradually decreased after this. After 6 days the remaining detergent was 12.4~23.7% from the various levels of initially added concentration, and 22.4~34.2% from the four kinds of detergents. These results show that the reduction of detergent was caused by *Oenanthe javanica* and the effect was significant during the first 6 days when the plants were still growing well. These results indicate that the plant purifies contaminated water for several days and the effect could be variable according to the level of contamination and the environment in which the plant grows.

References

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