Abstract—The allelopathic effects of wormwood plants (*Artemisia princeps* var. *orientalis*) and their possible phytotoxicity on receptor species were investigated. The aqueous extracts of mature leaf, stem, and root of wormwood plants caused significant inhibition in germination and decreased seedling elongation of receptor plants, whereas germination of some species was not inhibited by extracts of stems and roots. Dry weight growth was slightly increased at lower concentrations of the extract, whereas it was proportionally inhibited at higher concentrations. The calorie value of the organic matter in receptor plants measured by bomb calorimeter was reduced proportionally to the extract concentration. However, results with extracts of juvenile leaf did not correlate with inhibition or promotion of elongation and dry weight.

Key Words—*Artemisia princeps* var. *orientalis*, allelopathy, water extract, concentration, germination, growth, juvenile leaf extract.

INTRODUCTION

Plants in the genus *Artemisia* (Anthemideae, Asteraceae) are widely distributed (Mata et al., 1985) and are known to exhibit allelopathic effects. It is a Korean

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custom to uproot wormwood plants in old tomb areas because wormwood retards turf growth. Volatile substances emitted from wormwood plants have special fragrances and the burning smoke of the plants has been used as a mosquito repellent during summer nights. Thus, it may be postulated that wormwood contains phytotoxic substances.

The purpose of the present study was to find evidence of allelopathic characteristics of wormwood plants by evaluating seed germination and seedling growth in various concentrations of water extracts.

**METHODS AND MATERIALS**


*Germination and Growth Test.* Aqueous extracts were made from leaf, stem, and root of the wormwood plant. One liter of distilled water was added to 200 g of each type of explant at 20°C. After 24 hr, each aqueous extract was filtered through a 0.5-mm sieve, and the filtrates were either diluted to 10, 30, 50, and 70% extracts or used as an undiluted 100% extract.

The germination test was carried out in glass Petri dishes (12 cm) on one layer of filter paper wetted with the extracts. Fifty seeds were evenly dispersed in each dish. The control was treated with distilled water instead of an aqueous extract. The Petri dishes were held at 20°C by day and 15°C at night. The experiment extended over a period of 10 days to allow maximum seed germination. The results were determined by counting the number of germinated seeds and measuring the length of seedlings in millimeters.

Seeds of each type of receptor plant were sown in four plastic pots (10 cm) containing vermiculite. After germination was completed and small plants were eliminated, the 10 largest seedlings were grown for four to five weeks. Various concentration extracts (40 ml) were added to each pot every two to three days. The results included determination of the total length of each seedling and its dry weight. After the samples were oven-dried at 80°C to constant weight, dry weight of the seedlings was measured and the caloric content was determined by using a calorimeter (Shimadzu, CA-4). Ratio of germination, elongation, dry weight, and caloric ratios were calculated as suggested by Rho and Kil (1986):