Orobanche minor germination and interactions with red clover

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Abstract: My training in Japan comprised of two related activities conducted on the root parasitic weed *Orobanche minor*. The weed, an obligate parasite with a wide host range, is a copious seed producer. The seeds produced are endowed with prolonged viability and special germination requirements. To germinate the parasite requires after-ripening, a pre-treatment (conditioning) in a warm moist environment and exposure to an exogenous germination stimulant. The activities were designed to study i) effects of NaCl on germination and ii) the interactions of *O. minor* with red clover (a host) using the rhizotron technique. In the first activity NaCl, at 50-150 mM was applied to *O. minor* seeds during and after conditioning. The seeds were subsequently treated with the synthetic germination stimulant GR24 at 0.01, 0.1 and 1 ppm. Seeds conditioned in water for 7 days displayed 82% germination, irrespective of GR24 concentrations. Seeds conditioned in NaCl at 50, 75, 100 and 150 mM displayed 32, 29, 24 and 16 % germination, respectively. Seeds conditioned in water and treated with GR24 at 0.1 ppm in mixtures with NaCl at 50, 75, 100, 150 displayed 65, 64, 40 and 20% germination, respectively. The second activity was conducted with the primary objective of practicing the rhizotron technique and acquainting myself with the biology of *O. minor* as a model root parasitic weed. Red clover seeds were germinated in an incubator set at 23 ^{o} C. The seedlings were transferred to test tubes and allowed to grow for 7 days in distilled water and subsequently transferred to a rhizotron. Conditioned *O. minor* seeds were induced to germinate with GR 24 and the reuslting germlings, plotted dry on filter papers, were placed onto red clover roots. The rhizotrons were incubated and the set up was observed daily for a period of 45 days for the parasite attachment and development. Number of the parasite attached, tubercle, crown roots, shoot primordial and flowering were observed and recorded.

Keywords: root parasitic weed, *Orobanche minor*, germination, rhizotron, NaCl