

INTER- AND INTRA-POPULATIONAL GENETIC VARIATION IN SEED  
DORMANCY OF DIGITARIA CILIARIS

Masayuki Kataoka, Kenji Kataoka and Koji Tateno  
Kyushu National Agricultural Experiment Station, Kumamoto  
861-11, Japan

**SUMMARY**

Conspicuous inter- and intra-population genetic variations in seed dormancy were observed in Digitaria ciliaris (syn. D. adscendens), a predominantly self-pollinated weed species.

Bulk seed samples of 12 populations were collected from 16 plants of each population grown in a uniform garden. Each population sample was divided into two, and stored dry at 10°C and 25°C in darkness. Successive germination tests for the seed samples were made at 5, 50, 100, 200, 300, 400, 600 and 800 days after harvest to delineate the temporal pattern of changes in seed germinability of D. ciliaris populations. The seeds were highly viable throughout the period. D. ciliaris populations generally had high levels of seed dormancy just after the harvest and the dormancy broke gradually as time passed. There were differences in the dormancy breaking process among populations. One population showed a very low level of dormancy even at 5 days after harvest.

Inter- and intra-population variations in seed dormancy were studied, using seeds collected separately from 10 plants of each of 12 populations grown in a uniform garden. The seeds were stored dry at 25°C in darkness, and were used in germination tests at 50, 200 and 400 days after harvest. Nested analysis of variance was made to estimate variance components in germinability at each investigation. Significant variance components were observed not only among populations, but also among plants within populations at all three investigations. A high proportion (41%) of total variation in germinability at 50 days after harvest was ascribed to variation among plants within populations.

A more detailed analysis of variation structure of seed dormancy for a population consisting of 128 plants (8 sub-populations x 4 families x 4 plants) grown in a uniform garden showed that the variation among plants within a population is ascribed mostly to genetic variation.

It is concluded that genetic polymorphism may play an important role in germination polymorphism of D. ciliaris which enables this species to be one of "the world's worst weeds".