

Germination of Pollen Grains for Class Use

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The germination of pollen grains in 10 per cent sucrose has been used for some time as class demonstration. Last year a series of investigations carried on by Margaret Baker, one of my high school students, showed that the pollen of many of our common plants germinate readily in distilled water and in 1 per cent, 3 per cent sugar solutions. The granulated sugar used was found not to be 100 per cent sucrose. The solutions of 1 per cent, 3 per cent, 6 per cent, 10 per cent sugar and distilled water were put in watch glasses. Then pollen was placed in each solution. The time of beginning of tube development was recorded. In most cases studied, a tube was well formed in less than one hour and some in only a few minutes. The estimate of germination was made by taking a drop at random from each culture and mounting it on a microscopic slide. Ten such slides were made and germination estimated on basis of the ten random samples. If approximately 50 per cent of grains were forming tubes, the germination was considered very good. If approximately 25 per cent were germinated, it was considered good; 5 per cent to 10 per cent, fair; and below that, poor.

I have considered the flowers studied in three groups, those flowering in winter in greenhouse or in house, those flowering in spring, and those flowering in summer. The results of our investigations are shown in the following tables.

TABLE I—PLANTS FLOWERING IN WINTER

Name of plant	Water	1% sugar	3% sugar	6% sugar	10% sugar
Amaryllis.....	Very good	Very good	Good	Fair	Poor
Begonia.....	Good	Very good	Good	Fair	Poor
Hyacinth.....	Poor	Fair	Fair	Good	Good
Narcissus.....	Good	Good	Good	Fair	Fair

TABLE II—PLANTS FLOWERING IN SPRING

Name of plant	Water	1% sugar	3% sugar	6% sugar	10% sugar
Buttercup.....	Very good	Very good	Very good	Fair	Poor
Pussy willow.....	Very good	Very good	Very good	Poor	Poor
Bluebell.....	Very good	Very good	Fair	Poor	Poor
Crocus.....	Good	Good	Fair	Poor	Poor
Spring beauty.....	Fair	Fair	Poor	Poor	Poor
Tulip.....	Fair	Fair	Poor	Poor	Poor

TABLE III—PLANTS FLOWERING IN SUMMER

Name of plant	Water	1% sugar	3% sugar	6% sugar	10% sugar
Marigold.....	Good	Fair	Fair	Poor	Poor
Evening primrose...	Poor	Poor	Poor	Fair	Fair
Gaillardia.....	Poor	Poor	Poor	Fair	Fair
Hollyhock.....	Poor	Poor	Poor	Fair	Fair
Poppy.....	Poor	Poor	Poor	Fair	Fair
Petunia.....	Good	Good	Good	Fair	Poor
Sweet pea.....	Fair	Fair	Fair	Poor	Poor

In general, the pollen of summer flowers germinate better in 10 per cent sugar solutions than in lower percentages, except in case of marigold and petunia. Hyacinth shows better germination in 6 per cent and 10 per cent solutions, but the best germination obtained for hyacinth was not more than about 25 per cent of pollen-grains. Pussy willow, swamp buttercup, and amaryllis germinated the most readily of those studied, all having well-formed tubes in less than 30 minutes.