

FURTHER STUDIES ON USTILAGINALES:

MORPHOLOGY AND SPORE-GERMINATION OF *PERICLADIUM GREWIAE*

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Pericladium is an important genus of the family Ustilaginaceae. The genus has been described by Saccardo (1888). Mundkur and Thirumalachar (1952) recorded two species from India. In Ajmer a few species of *Grewia* are attacked by this genus which produces considerable loss to the plants. For two years the writer has studied the symptoms of the disease and spore-germination in detail.

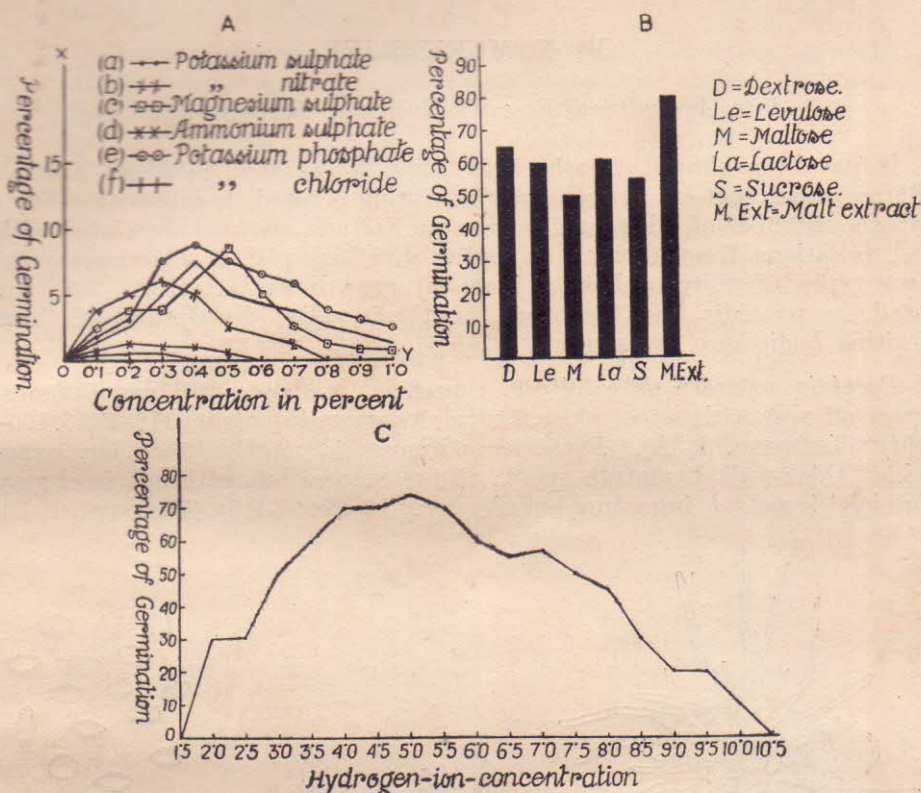
For the present investigation *Pericladium grewiae* was collected from many localities of Ajmer on different species of *Grewia*. The twigs and branches were first dried for 24 hours and then kept in cellophane bags which were later used for spore-germination studies. The salts and sugars used for this investigation were in chemically pure forms.

The symptoms of the disease mainly appear on the petiole, twigs and branches of the plant. Both young and mature plants are susceptible to the disease. The disease can be easily detected by the presence of blister-like pustules, each of which is covered by a coriaceous, hard and woody indusium formed by the host tissue. These blisters increase in size and form bigger pustules. Sometimes the upper branches are severely affected by the disease and appear like the Witch's broom. The diseased plants get deformed and stunted. At maturity the host tissue which covers the pustules degenerates and exposes the powdery mass of black spores. In Ajmer this is a very common sight during the winter months and it persists for a long time. The spore mass is black. Each spore is globose, subglobose, sometimes ellipsoidal, greyish in colour, 5.5 to 9 μ in diameter and with thick and smooth episore.

The spores of this smut readily germinate in the water and in solutions of salts or sugars, but a number of salts proved to be toxic. In ordinary water the spore germinates within 24 hours, its exosporium bursts and endosporium gives rise to a septate promycelium with a single terminal sporidium which easily get detached at a later stage.

Sodium chloride and *Sodium carbonate* were proved to be toxic and there was no germination even in 0.1% solution of the salts like that in *Sphacelotheca mcalpineae* Zundel (Joshi, 1957). *Ammonium sulphate* and *Potassium chloride* also proved to be highly toxic. The other salts like *Potassium sulphate*, *Magnesium sulphate*, *Potassium nitrate* and *Potassium phosphate* were not so toxic although the percentage of germination was fairly low. The results are shown in TEXT-FIG. 1-A. The spores germinated in 4% solutions of *dextrose*, *laevulose*, *maltose*, *lactose*, *sucrose*

and malt-extract. The maximum germination was observed in 4% malt-extract (TEXT-FIG. 1-B).



TEXT-FIG. 1.—Graph showing rates of spore-germination

Further observations were made on the effect of pH where the spores germinated in 4% lactose solution at room temperature (22°–23°C.) and having a pH range of 1.5 to 10.5 which was determined by Beckman's pH meter. The results are given in TEXT-FIG. 1-C, and show that the spores were capable of germination in a wide range of pH, i.e., 2.0 to 10.0. The optimum pH was 6.5.

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