

The pollen grains of a stamen taken from a plant belonging to a good species, are all uniform as to size and general appearance. When examined in a drop of water under a microscope magnifying 200 to 500 times they appear opaque and of a dull grayish colour, owing to the fact that they are filled with a rich and slightly granulated protoplasm.

The opaque appearance of the pollen grains and also their uniformity are characters which can be observed not only on living plants but also on pressed material which has been kept dry for many years.

The appearance of the pollen, developed by a hybrid plant, is quite different. In the first place, the pollen grains are far from uniform in size and shape. Only a few reach the size of those of a good species, the majority being much smaller. They appear irregular in outline, are often shrunken and always of a bright colour. Examined under a microscope with a low magnification, say 100 times, the pollen from a hybrid violet gives an impression of emptiness and sexual incapacity. Examined under higher magnification, most of the pollen grains prove really, to be empty or filled with a watery content. Even those grains which, under lower magnification, appear to be fairly normal, prove to be filled with a very poor and watery protoplasm, and are therefore almost transparent.

The percentage of good sized grains in pollen of violet hybrids varies with the combination of the hybrid. The closer the species from which a hybrid has been formed are related to each other, the less degenerated becomes the pollen of the hybrid. Those hybrids, however, which are formed from systematically widely separated species, have an extremely poor pollen, the percentage of evidently wholly useless pollen grains often running as high as 95 per cent or more.

The sterility of the pollen in the petaliferous flowers of hybrid violets is, briefly, just as marked as the sterility of the capsules of the cleistogamous ones and consequently furnishes an equally excellent means whereby, in doubtful cases, the hybrid nature of violet plants can be ascertained.

The fact that hybrids between distinct species of violets show reduced sexual capability, should evidently be of great assistance to students endeavouring to reach a clear understanding of the systematic relationships of closely allied forms, inasmuch as the sterility or fertility of intermediates between such forms may decide whether the forms in question represent distinct specific units or merely are varieties of one species.

This question will, however, not be further discussed in the present paper.