



Fig. 1. Stigma and part of style of *S. pinnatisectum*, 72 hr. after pollination with *S. lanciforme* pollen. There is practically no germination of pollen

Fig. 2. Pollen of *S. bulbocastanum* germinated on an agar-sucrose-gelatin medium

in eight distinct taxonomic series, and our information concerning the cytogenetic affinities among them is still very fragmentary. As a preliminary towards gathering such data, a systematic survey of ability to cross among the diploid species occurring in Mexico was undertaken by me, during the summer of 1953, at the Inter-regional Potato Introduction Station, Sturgeon Bay, Wisconsin.

The following diploid species were used in the study: *S. pinnatisectum* (series *Pinnatisecta*), *S. bulbocastanum* (series *Bulbocastana*), *S. lanciforme* (series *Cardiophylla*) and *S. polyadenium* (series *Polyadenia*). In the first set of crosses made in the usual way (emasculation followed by controlled pollination), only the cross *S. pinnatisectum* × *S. polyadenium* succeeded. A study was then made of the causes for the failure of seed-setting in the crosses *S. pinnatisectum* × *S. bulbocastanum* and *S. pinnatisectum* × *S. lanciforme*. For this purpose, the ovaries with style and stigma were fixed in Carnoy's solution (alcohol, acetic acid, chloroform, 6:1:3), 24, 36, 48, 72 and 120 hr. after pollination, sectioned and stained with acid fuchsin and light-green. Examination of the slides revealed that in both crosses there was little or no germination of the respective pollen on the stigma even after 72 hr. from the time of pollination (Fig. 1). This duration is usually found to be sufficient to allow fertilization in compatible crosses. In the few germinated pollen grains the length of the tubes was only about three times the diameter of the pollen.

To overcome the pollen-stigma incompatibility, two techniques were tried, namely, smearing the stigmatic exudation from the pollen parent on the stigma of the pistillate parent, before pollination, and applying a suitable artificial medium for pollen germination on the cut surface of the style after removal of the stigma. An intermediate method described below led to the formation of berries and seeds in both crosses. The stigma, with a small portion of the style, was removed with a pair of fine scissors from the flowers of *S. pinnatisectum*, and a drop of an agar-sucrose-gelatin medium was applied to the decapitated surface of the style. This medium was prepared by dissolving 0.5 gm. of agar and 2.5 gm. of sucrose in 25 c.c. of distilled water to which 0.5 gm. of gelatin was added. The pollen grains of many species of *Solanum* were found to grow well in this medium (Fig. 2). After applying pollen to this medium on the cut surface of the style, the cut style was covered with a piece of moist cotton wool. From the crosses *S. pinnatisectum* × *S. lanciforme* and *S. pinnatisectum* × *S. bulbocastanum*

thus made, four and three berries containing on an average thirty-nine and eight seeds respectively were obtained. Seeds from these crosses were grown at the Inter-regional Potato Introduction Station, Sturgeon Bay, in the summer of 1954 by Dr. R. W. Hougas, who found that the plants were real hybrids.

Such crosses have been attempted previously by several workers in different countries but without success¹. The hybrid between *S. pinnatisectum* and *S. bulbocastanum* may be of particular interest to potato breeders as a valuable breeding stock, since Niederhauser and Mills² have recently reported that *S. bulbocastanum* is not only resistant to late blight but is also probably the only species immune to it.

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¹ Swaminathan, M. S., and Howard, H. W., *Bibliographia Genetica* 16, 1 (1953).

² Niederhauser, J. S., and Mills, W. R., *Phytopath.*, 43, 456 (1953).

The Pogonophora

A REPORT has recently been published in the daily Press alleging that Russian zoologists have lately discovered a new phylum of animals, the Pogonophora. This is, of course, a mistake, and in the paper by A. V. Ivanov, published in *Systematic Zoology*, 3, 69 (1954), and in *Dokl. Akad. Nauk S.S.S.R.*, 100, 175, 381, 595 (1955), acknowledgment is generously made to all previous workers on this interesting group. The animals have been known for some time; but Ivanov has created a new phylum for them, and this may have caused the misunderstanding.

Pogonophora are elongated tubicolous animals the body of which is composed of a short anterior portion bearing tentacles and a very long trunk. The anterior portion contains two pairs of coelomic cavities of which the first contain so-called nephridia and the second are continuous with the cavities of the tentacles. The trunk contains a third pair of coelomic cavities in which lie the gonads. The hinder part of the trunk shows repeated ring-shaped papillae of chitinous platelets serving as adhesive organs. A dorsal nerve centre is present; but no trace has hitherto been found of gut, mouth or anus.

Although so much remains to be discovered in these animals, it is quite possible that Caullery and Ivanov are right in looking for their affinities among those groups which include the Enteropneusta. The tripartite arrangement of the coelom and the dorsal nerve centre immediately suggest this. Details will be eagerly awaited regarding the structure of the so-called nephridium before it will be possible to compare it with the nephridium of the actinotrocha larva of *Phoronis*. Altogether, enough is known of these organisms to whet the appetite for more, and the results of Prof. Ivanov's further investigations will be awaited with interest.

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