A Strawberry Fruit Rot Caused by Pestalotia longisetula

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Florida Agricultural Experiment Stations Journal Series No. 4603.

Accepted for publication 16 January 1973.

ABSTRACT

During the winter of 1972, a new strawberry fruit rot caused by *Pestalotia longisetula* caused severe losses in some research plots and in some commercial plantings of the cultivars 'Tioga' and 'Fresno'. Isolations from the fruit rot lesions usually yielded only *Pestalotia longisetula*. Rot lesions similar to those in the field developed on surface-sterilized fruits when they were inoculated with spore suspensions of the fungus.

Phytopathology 63:862-863.

Additional key words: Fragaria × *ananassa.*

During the early part of the 1972 strawberry fruiting season in central Florida, unusual fruit rot lesions were noticed on many ripe berries of the cultivars 'Tioga' and 'Fresno' in plots at the Agricultural Research Center, Dover, Florida. These were first thought to be atypical lesions caused by *Colletotrichum fragariae* (2) or *Dendrophoma obscurans* (C. M. Howard, *unpublished data*). However, abundant white mycelium developed on berries with these lesions within 3 or 4 days after they were surface sterilized and placed in autoclaved jars. Little or no aerial mycelium develops on berries infected by either of the previously mentioned pathogens. Droplets of liquid approximately 1 mm in diameter formed on the surface of the mycelium on berries within 1 week. These appeared black to the unaided eye and dark brown when viewed with a dissecting microscope. Examination of the liquid with a microscope revealed numerous spores of a *Pestalotia* species. Since there are apparently no previous reports of any strawberry disease caused by a *Pestalotia* species, an investigation was undertaken to identify this species and to determine whether it is a primary pathogen.

In the early stages of development in the field, lesions are 2 to 4 mm in diameter, dry, light tan, slightly sunken, and often irregular in shape. As the rot progresses, this central area enlarges and becomes nearly circular but remains dry, light tan, and only slightly sunken below the original surface of the fruit. A circular band of tissue around this central area usually becomes soft and definitely sunken. The entire berry is eventually affected and mummifies. Lesion development in the field is somewhat variable (Fig. 1A). At times the central area enlarges until most of the berry is dry and light tan. With this type lesion, no soft rot band develops. Occasionally white aerial mycelium develops on infected parts of the berry around the central area and droplets of liquid containing spores are scattered over the mycelium. In a third variation, numerous acervuli erupt through the epidermis around the central area in the absence of mycelium and part or all of the berry appears black. The acervuli, bordered by the torn epidermis (Fig. 1B), can be seen with the aid of a hand lens. Usually only *Pestalotia* can be isolated from any of these lesions.

This rot persisted throughout the fruiting season with up to 75% of the berries in some research plots being infected on some harvest dates. It was also found to a more moderate extent in several commercial fields.

MATERIALS AND METHODS.—Many *Pestalotia* isolates were obtained from decaying strawberries during the early part of this investigation. One isolate was chosen at random for use in the inoculation studies. It was identified as *Pestalotia longisetula* Guba (1) by the senior author and by J. W. Kimbrough, Associate Mycologist at the University of Florida.

Two pathogenicity tests were completed during this investigation. *Pestalotia longisetula* was grown on potato-dextrose agar in petri dishes. The cultures were flooded with sterilized distilled water and the resulting spore suspensions were poured into sterilized flasks. There were 1,500 spores/ml in the inoculum for test no. 1 and 4,000 spores/ml in the inoculum for test no. 2. Ripe and green Tioga berries were surface sterilized by immersion for 1 min in 95% ethyl alcohol followed by 15 min in a 0.5% sodium hypochlorite solution. They were rinsed four times in sterilized distilled water and placed aseptically in autoclaved jars, one fruit per jar. Lids were placed loosely on the jars to allow the escape of excess moisture but maintain sterile conditions. The berries were inoculated by placing small droplets of spore suspension at two points on the uninjured surface of each berry. Controls received small droplets of sterilized distilled water. The jars containing fruit were then placed under fluorescent lights 1,880 lx (175 ft-c) in the laboratory where the temperature fluctuated from 24 to 28 C. The numbers of lesions in each series were recorded after 5 and 7 days incubation. There were 10 ripe and 10 green berries in each series.

RESULTS AND DISCUSSION.—Guba (1) described the acervuli of *P. longisetula* from canes of *Rosa* sp. as being globose-lenticular, 140- to 280-μ diameter, seated in the bark, erumpent and surrounded by torn shreds of epidermis. The acervuli

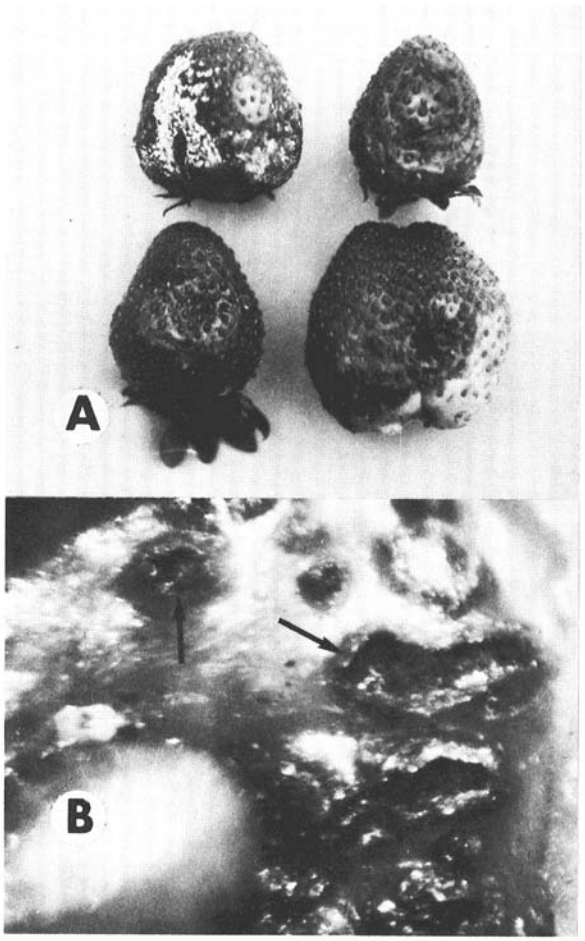

Fig. 1. A) Strawberry fruit rot caused by *Pestalotia longisetula*. **B)** Acervuli of *P. longisetula* on fruit (arrows).

produced on strawberry fruits in this investigation fit Guba's description except that they were much larger (up to 327 μ X 736 μ). The conidial morphology of our isolate seems identical to the description of *P. longisetula* given by Guba except that pedicle length of spores of our isolate was 8.7 to 14.5 μ compared to Guba's description of pedicles 9- to 12-μ long. Guba (1) stated that the fructification usually cannot be considered significant in the definition of *Pestalotia* species, and that small differences in measurements of spores or their appendages are insignificant. Therefore, the isolate used in this investigation is considered to be *P. longisetula*.

The fruits for test no. 1 were obtained from a field in which *Pestalotia* fruit rot was moderate. Ripe fruits and mature green fruits in the white stage were used in this test. Five days after inoculation, lesions had developed at 75% and 35% of the inoculation points on ripe and green berries, respectively. Lesions had also developed at 30% and 0% of the inoculation points on ripe and green control fruits, respectively. Most of the green berries had ripened by this time.

The fruits for test no. 2 were obtained from a field in which there was very little *Pestalotia* fruit rot. Ripe and immature green berries were used in this test. After 5 days, lesions had developed at 84% and 10% of the inoculation points on ripe and green berries, respectively. Only the one infected green fruit had begun to ripen at this time. Lesions had developed at 5% and 0% of the inoculation points on ripe and green control fruits, respectively. In each test, the number of lesions after 7 days was the same as at 5 days except that one more lesion had developed on a ripe control fruit in test no. 2. *Pestalotia longisetula* was readily reisolated from infected berries in both tests.

Lesions did not develop on inoculated fruits that remained green during these tests. Infection was apparent only after the berries began to ripen. This indicates that green berries are not as susceptible as ripe berries.

Early lesion development on inoculated fruits was similar to that in the field, but the lesions usually were soon obscured by abundant mycelial growth. Typical lesions with light tan centers and surrounding sunken bands of soft tissue were visible on only a few of the inoculated berries before the lesions were obscured by mycelium. The droplets of liquid containing spores, as described in the introduction, occurred on the mycelium on all berries that became infected in the laboratory.

From the evidence obtained during this investigation, it is apparent that *P. longisetula* is a primary pathogen on strawberry fruit in Florida.

LITERATURE CITED

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