A DIAPORTHE CANKER OF AMERICAN ELM

WITHIN the past few years specimens of American elm affected by a canker disease were collected from two different localities in eastern Massachusetts. Specimens from one locality consisted of dead branches, bearing large conspicuous cankers which in many cases had girdled the branches. Many of the diseased areas were hypertrophied, with margins of thick cork layers surrounding areas of exposed wood. In some cases the branches appeared to be twisted because of the irregular semi-spiral arrangement of several contiguous and much calloused cankers. The other specimens bore cankers in a younger stage of development partially girdling the branches. The diseased areas were slightly depressed, roughened and cracked along the margin. The surface of the cankers was covered with small pustules. On one of the branches the canker extended through several nodes and was sharply delimited by a definitely raised layer of cork. Branching out from this diseased area was a young twig, which had been killed back. The new growth was stunted and the leaves had become brown and dry before reaching maturity.

The pycnidia on the host are solitary, black, smooth, carbonous, ostiolate with short necks, conical or elliptical. The pycnidial cavity is irregularly shaped because of the protrusions of the basal layers. No compound pycnidia were observed in any sections. The spores formed in the pycnidia are of two types, the alpha spores and the beta spores or so-called stylospores. Both the alpha and beta spores are produced on the same type of sporophore, which is subulate or clavate, persistent, and measures approximately 11.2–15.2 μ x 2.8–5.2 μ. The alpha spores on the host and from the twig cultures are hyaline, one-celled, biguttulate, ovoid or elliptical with subacute extremities but occasionally with narrow pointed ends. The standard range of one hundred spores from the host was 6.5–8.2 μ x 2.7–3.5 μ, while that of one hundred spores from twig cultures was 7.1–8.8 μ x 3.1–4 μ. The beta spores are long, cylindrical, hyaline, one-celled, usually hamate and tapering to a point at the curved end. The standard range of one hundred spores was 22.7–27.5 μ x .98–1.3 μ.

The perithecia were obtained in cultures on sterilized twigs and on malt agar. On the twigs the perithecial stage is indicated by the appearance of protruding corrugated black beaks. The perithecia are single or clustered, always separately erumpent, membranous, leathery, globose, and measure approximately 400 μ x 385 μ. They are usually in darkened effuse stromatic areas, and beneath these dark marginal zones lines develop in the wood. The beaks are elongate, slender, projecting about 5 mm from the surface of the twig. The interior of the necks is lined with periphyses. The asci are cylindrical, clavate, and measure approximately 33–50 μ x 5.1–6.9 μ. At the apex of the ascus the wall is much thickened and the pore is surrounded by a refractive ring. Paraphyses are usually present; they are long, slender, sinuous, continuous, simple, without bulbous tips, and with granular contents. The ascospores are uniseriate or biseriate, two-celled, hyaline, slightly constricted at the septum, four-guttulate, granular, with a standard range of 10.9–12.3 μ x 3.8–4.5 μ for one hundred spores.

Naturally it was of interest to determine if possible the exact identity of this fungus, which apparently caused a pronounced canker disease of American elm. According to the description given by Gaüman[1] following Von Höhnel's classification, the ascospore stage should be placed in the rearranged family Diaporthaceae because of the sessile asci which break away from the hymenial layer at maturity. The fungus seems to correspond with the genus Diaporthe as described by Wehmeyer[2], since it has hyaline, ellipsoid, two-celled spores and forms a dark marginal zone line in the wood. The conidial stage of the fungus studied also seems to correspond with the form genus Phomopsis reported by Wehmeyer. The following five species of Diaporthe described by Saccardo[3] were carefully compared with the fungus studied: *D. protracta* Nke., *D. perjuncta* Niessl., *D. discutiens* Sacc., *D. Malbranchei* Sacc., *D. eres* Nke. The description of *D. eres*, however, corresponds most closely. The descriptions of species of Phomopsis on elm are so fragmentary that a satisfactory comparison of species is extremely difficult. However, seven species described by Saccardo have been compared with the Phomopsis now being studied. *Phomopsis oblonga* Sacc. has been most completely described and appears to resemble this Phomopsis. Saccardo considers *Ph. oblonga* with alpha spores 6–7 μ x 3 μ and beta spores 33 x 1 μ to be the imperfect stage of *Diaporthe eres*. Grove[4] on the other hand reports *Ph. eres* Sacc. with alpha spores 9–10 μ x 2.5–3 μ and beta spores 25–30 μ x 1 μ as the imperfect stage of *D. eres*. Grove mentions that Saccardo has suggested that *Ph. oblonga* and *Ph. eres* are the same, although Saccardo gives distinctly different spore measurements for each. It is impossible to state the exact identity of either the Diaporthe or the Phomopsis of the present study, since type specimens were not available for comparison.

[1] E. Gaüman, "Vergleichende Morphologie der Pilze." Jena, 1926.

[2] L. E. Wehmeyer, "A Biologic and Phylogenetic Study of the Stromatic Sphaeriales." *Am. Jour. of Bot.*, 13: 575–645, 1926.

[3] P. A. Saccardo, "Sylloge Fungorum." Vols. 1 to 24. Padua, 1882–1926.

[4] W. B. Grove, "New or Noteworthy Fungi, Pt. VI, *Phomopsis eres* Sacc." *Jour. of Bot.*, 56: 285–294, 1918.

Buisman[5] described a species of Phomopsis causing a canker on elm trees in Holland. As a result of cultural comparisons with cultures loaned through the courtesy of Dr. Buisman it appears that the organism isolated by her corresponds for the most part with that of the present study.

BLYTHE G. RICHMOND
DEPARTMENT OF BOTANY,
BROWN UNIVERSITY

A NEW BACTERIAL DISEASE OF PEARS

IN the course of an investigation on the green fluorescent bacterial plant pathogenes, a very pathogenic organism belonging to this group was obtained from a plate given me by Mr. K. G. Parker who was at the time isolating *Erwinia amylovora*. The isolation was made from colonies with green pigments in the medium, appearing as a contamination. The presence of such green fluorescent organisms in isolation work is not an unusual occurrence. Frequently they are discarded as saprophytes, in some cases with good reasons. Their presence is usually given no significance because of their ubiquitous nature in plants, seeds, water and soil.

There is practically no information as to the relation these organisms have to economic plants. There is, however, an increasing realization that some of them are plant pathogenes. The organism here described is such an example and has not heretofore been known.

SYMPTOMS OF THE DISEASE

The manifestation of blight on flowers, which turn dark brown and die, is very apparent. On matured leaves, black round spots are produced, while on young leaves similar spots have a yellow "halo" and the leaves often become distorted. Black, almost circular spots are produced on young and mature fruits, but more readily on the latter.

PATHOGENICITY

Artificial inoculations on fruits, flowers, leaves and stems of a hybrid pear, *Pyrus communis* × *serotina*, clearly established the pathogenic nature of the organism. Cross inoculations revealed a wide range of hosts. Infection was obtained on *Vigna sinensis, Phaseolus vulgaris, Purearia hirsuta, Vicia faba* and *Syringa vulgaris*.

A study of the organism showed it to be a *Pseudomonas*, but a comparison with the descriptions of the known species of these bacterial plant pathogenes found on pear, *Pseudomonas barkeri* and *Pseudomonas nectarophila*, showed no identity. Its fluorescigenic character is readily observed in a medium consisting of 0.3 gm $MgSO_4$, 2 gm K_2HPO_4 and 3 gm asparagine per liter, adjusted to about pH 6.9. It is closely related to *Pseudomonas syringae, Pseudomonas vignae* and *Pseudomonas viridiflava*, but distinctly not identical to any of these species. The organism is named and briefly described.

Pseudomonas utiformica sp. nov.

Motile by one to two polar flagella; rods with rounded ends; 0.7–1.5 x 1.3–3.1 μ, occurring singly and in pairs; no spores; no capsules; gram-negative; not acid-fast; facultative anaerobe; green fluorescent; beef-extract agar colonies round or fimbriate, grayish white to slightly greenish; nutrient broth fairly turbid in 24 hours; gelatine liquefied; milk not curdled, alkaline; nitrate not reduced or weakly reduced; ammonia produced; H_2S and indol not produced; dextrose, galactose, levulose, mannose, arabinose, xylose, sucrose, raffinose, manitol, glycerol, and salicin are fermented; no fermentation in rhamnose, maltose, lactose; starch and cellulose not digested; growth in malic, citric, succinic, formic, and lactic acids; no growth in tartaric acid.

Pathogenic on: *Pyrus communis* × *serotina, Vigna sinensis, Phaseolus vulgaris, Pueraria hirsuta, Vicia faba, Beta vulgaris, Syringa vulgaris, Prunus avium.*

The genus *Pseudomonas* is used according to Bergey's definition and as proposed by Burkholder. If the S. A. B. committee's recommendation for plant pathogenes is adopted the genus should be *Phytomonas*.

FELICIANO M. CLARA
DEPARTMENT OF PLANT PATHOLOGY,
CORNELL UNIVERSITY

THE PRODUCTION OF MUCIFICATION OF THE VAGINAL EPITHELIUM OF RODENTS BY THE OESTROUS HORMONE

THE production of vaginal mucification by *corpus luteum* extracts which maintain pregnancy in overiectomized pregnant animals, as described in a recent article in SCIENCE by Harris and Newman,[1] is, we believe, not a test for progestin but a test for the small amount of oestrin which the extracts used by them undoubtedly contain. In 1928, one of us, (R. K. M.) with Hisaw and Weichert,[2] described the production of a similar reaction in the rat with *corpus luteum* extracts. Shortly after, in 1929, the other, (W. M. A.) with Corner,[3] described the produc-

[5] J. Westerdijk and C. Buisman, "De iepenziekte rapport over het onderzoek verricht op verzoek can de Nederlandsch heidemaatschappij." pp. 56–62, 1929.

[1] R. G. Harris and D. M. Newman, "A Practical Test for Potency of Extracts of *Corpora Lutea*." SCIENCE, 74, 182, 1931.

[2] F. L. Hisaw, R. K. Meyer and C. K. Weichert, "Inhibition of Ovulation and Associated Histological Changes." *Proc. Soc. Ex. Biol. Med.*, 25, 754, 1928.

[3] G. W. Corner and W. M. Allen, "Physiology of the *Corpus Luteum*. II. Production of a Special Uterine Reaction (Progestational Proliferation) by Extracts of the *Corpus Luteum*." *Am. Jour. Physiol*, 88, 326, 1929.