OPHTHALMIC DISEASE CAUSED BY A MYCETE OF THE GIANT CANE*

BY

JOHN SPERO KINNAS

Corinth, Greece

THE determining factors of the disease are the giant cane (*Arundo donax*) and the mycete *Acremonium*. The giant cane belongs to the family Gramineae, which is to be found all over the earth. The full-grown stem, dried and stripped of its blade-like leaves, is used for weaving baskets and for building huts. In agriculture and horticulture it is used to make props for vines, garden plants, and transplanted trees, as well as for building fences. The mycete *Acremonium*, isolated during mycetological examinations, has been classified as follows: Class, deuteromycetae or fungi imperfecti; Order, Moniliales; Family, Monilialeae; Genus, *Acremonium*.

The first to study this mycete was Vuillemin (1931), who in 1911 had described the species *Acremonium potronii* as consisting of a mycetelium with sparse bifurcations and vertical sporophorous branches ending in a simple conidium. Link (1809), Dodge (1936), and Brumpt (1949) mentioned the genus. Ciferri (1960) reported that it might possibly be pathogenic in man and that it was also found on the conjunctiva. However, when this is so the greatest care and closest examination are required in order to exclude any other pathogenic causes if the damage is to be ascribed with certainty to the mycete *Acremonium*. The latter may also have allergenic properties.

Spread of Infection

The farmer, in order to use the cut, dried canes, gathers them from the ground where they have been left lying to dry. The cutting is usually done before sunrise. He then strips the stems of the dried leaves, either by hand or with a pruning knife. This process is easier to perform when the canes are dry than when they are still green. In the spring and autumn the dried stems are put up as props for plants. The infection thus spreads either through the hands coming into direct contact with the mycete, or from the mycete being scattered abroad from the dried cane leaves.

The primary condition for the evolution of the disease is that the cut canes are left lying on the ground, usually for one to two months or more. After this time small spots visible to the naked eye appear, scattered over the dry leaves and forming chain-like clusters in places. Resembling mildew, they are of a yellowish chalk-like colour and powder-like as to their substance.

* Received for publication September 11, 1964.

Diagnosis

Clinical Findings

The diagnosis is established mainly from the clinical manifestations, which appear almost simultaneously in both eyes (Fig. 1). In addition to the usual symptoms of corneal irritation the following signs are seen:

(1) The skin of the eyelid shows a rather marked oedema, particularly round the edge and the inferior orbitopalpebral sulcus. More or less abundant granulomata may occur; these are occasionally polypoid, ranging in size from a pinhead to a lentil or even a bean. A lichenoid erosion is also noticeable, especially in the folds of the skin, as well as a pronounced eruption in the form of acne. There is epiphora and palpebral spasm.

(2) With regard to the conjunctiva and the cornea we notice in particular round the palpebral fissure a hyperaemia of the conjunctiva with oedema accompanied by a serofibrinous or mucous secretion.

FIG. 1.—Appearance of the eyelids, conjunctivae, and cornea.

Upon application of methylene blue the conjunctiva shows multiple epithelial erosions from pinhead to lentil size, while the cornea shows punctate erosions.

Examination with the slit-lamp reveals a keratitis with unaffected areas between the ulcers. After a lapse of 10 to 15 hours the entire cornea may be ulcerated with progressive spread in the absence of suitable treatment.

In most cases the symptoms remain stationary for the first 24 hours. Within 48 hours an improvement of the condition sets in, starting from the periphery and moving towards the centre.

Healing of the conjunctival lesions usually takes place within four or five days, while the cornea may take as long as six or seven days, rarely more than 12 days, to heal. During the process of repair a cloudiness appears under the epithelium in Bowman's membrane and the parenchyma, lasting usually from three to four days. This cloudy infiltration subsequently becomes less pronounced or disperses, a process which may take from three to five days, sometimes even longer.

The manifestations on the skin of the eyelids are often accompanied by similar ones on the skin of the cheeks, the sides of the neck, or the scrotum. Generally two stages may be distinguished in the symptoms described: the incubation stage with the antecedent symptoms, which appear three to five hours after the infection

has taken place, and which are slight and intermittent; and the invasion stage, which follows six to nine hours after the first stage—that is about 10 to 15 hours after the initial infection—and is accompanied by intensive and continuous symptoms. This stage continues for two to three days after treatment has begun.

Mycetological Examination

The diagnosis, suggested by the clinical findings, is supported by the isolation of a mycete of the genus *Acremonium* from dried cane leaves with which the patient has been working (Fig. 2). This mycete is also the aetiological factor of the disease. In the cases which came to our notice no lesions of the skin existed before, or occurred during, the handling of the canes. It was possible to reproduce the disease experimentally by scattering the dust from dried cane leaves and blowing it into the eyes of guinea-pigs. The clinical symptoms were similar to those observed in humans.

FIG. 2.—Morphology of the mycete *Acremonium*.

Treatment and Prognosis

The disease was treated in 33 cases with sulphanilamide; in a few cases anti-mycotics were administered. In no case were penicillin, streptomycin, or corticosteroids given, since these favour the development of mycetiasis.

The prognosis of the local symptoms is good. The disease causes immediate deterioration of the eyesight. However, this is in most instances temporary, although it may occasionally become permanent.

The mycetological examinations were carried out at the Mycetological Laboratory of the Benaki Institute for Plant Diseases at Kiphissia, to the Director of which, Dr. D. Kougeas, I would like to express my most cordial thanks.

REFERENCES

- BRUMPT, E. (1949). "Précis de parasitologie", 6th ed., vol. 2, p. 1824. Masson, Paris.
 CIFERRI, R. (1960). "Manuale micologia medica", vol. 2, pp. 515, 526. Pavia.
 DODGE, C. W. (1936). "Medical Mycology". Kimpton, London.
 LINK, H. F. (1809). *Mag. Ges. Naturf. Freunde Berl.*, 3, 15.
 VUILLEMIN, P. (1931). "Les champignons parasites et les mycoses de l'homme". Lechevalier, Paris.