ながいもの新病害

農學士　伊藤誠哉

A NEW FUNGUS DISEASE OF THE YAM.

By

SEIYA ITO, *Nogakushi.*

In the vicinity of Sapporo, the leaves and vines of the cultivated yam *(Dioscorea Batatas)* are yearly more or less affected by a fungus, belonging to the genus Cylindrosporium. The same fungus is also found on the wild yam *(Dioscorea japonica)*.

The disease of the wild yam was first noticed in 1889 by Prof. Dr. K. MIYABE in Tokyo, and after that time, many specimens of the diseased yam both cultivated and wild were collected in various places of our country by him and others. In 1902, Mr. TOKUBUCHI collected the same fungus on the wild yam in the Island Oki in Kiushū. During my botanical excursion in the Province Echigo in the summer of 1908, I had collected the diseased leaves of *Dioscorea japonica*, and an examination showed that it was also due to the same fungus. Recently, I obtained the same diseased specimen of the cultivated yam from Morioka in Northern Honshū through the kindness of Prof. G. YAMADA. These facts show that the disease is very common and very widely distributed throughout our country.

In the last fall, the present disease severely threatened the yam which was cultivated in the experimental plots of our college and in the adjoining fields. At that time, I had an opportunity of examining the symptoms of this disease as well as the nature of its causal fungus by the fresh materials; and I have been able to recognize that the fungus in question is new to science and the disease itself to have passed unrecorded up to the present time. This short paper is intended to report upon some results of my study on this new disease of the yam.

I wish to express here my heartiest thanks to Prof. Dr. K. MIYABE, who has kindly placed at my hand all the materials he had collected for my study.

Symptoms of the Disease.

In the middle part of September, many small yellowish unbordered specks appear on both surfaces of the leaf of the yam. In the central portion of the discolored area, numerous yellowish-brown pustules are usually to be observed. Under a magnifying glass, these pustules are seen to be slightly raised and covered by a membrane. The color of the pustules gradually turns into brown and finally into dark brown. At or previous to this period, the membrane ruptures and the hymenium of the fungus is exposed presenting the appearance of a small white point to the naked eye. When the surrounding conditions are favourable to the growth of the fungus, conidia ooze out very abundantly in a flesh-colored or pinky white mass.

During the development of the pustules, the color of the specks also turns gradually from yellow to brown and finally to blackish brown, and a distinct darker colored border appears along their margin. Such discolored spots are roundish, polygonal or irregular in shape, and are scattered or gregarious, often confluent forming a large irregular spot. The symptoms are most conspicuous when a young leaf has been attacked by the fungus. In that case, the entire leaf becomes affected making it dry and shrink up. When badly attacked, no green leaves can be observed on a young shoot.

The fungus often attacks also the young vines and petioles of the yam. The pustules appear mostly in rows along their ridges, and their shape is longer than those on the leaf-blade. All the leaves on such affected vines are almost always attacked and killed by the same fungus; and in severe cases, the pustules also appear along the veins on the undersurface of the leaf. Such affected vines may be recognized at a glance by the presence of many dead black leaves on them as well as by the fact, that the vines are more or less hypertrophied, and lighter colored.

Nature of the Causal Fungus.

A section through a pustule shows that the hymenium of the fungus is formed under the cuticular layer. The stroma penetrates between the epidermal cells

reaching to pallisade cells, whose chloroplastids are destroyed. The conidiophores are thickly arranged parallel to each other and at right angles to a cushion of stroma, from which they arise. They are simple, straight or slightly curved, hyaline, smooth and unseptated, with granular contents. They measure 18–25 (rarely 30) × 3–3.5 μ.

A conidium is produced on the apex of the conidiophore. The spore is filiform or clavate-cylindrical in shape, straight or mostly curved on one side, and rounded at both ends. They are smooth, hyaline and guttulate. When the conidia are stained with iodine solution or other coloring solutions, it will be clearly observed that the majority of them consist of one to three, rarely four cells. When it is mounted in water or potash, these septa may often be overlooked. They measure 26–67.5 × 2–3.5 μ.

Placed in a drop of water or the decoction of the host-plant, the spores germinate within 24–50 hours, throwing out one or two germ-tubes at or near the ends. The germinating hyphae are hyaline, about 2μ in width and occasionally swollen in irregular shape.

Nomenclature of this Fungus.

From the morphological characters of the spore and hymenium, we may easily recognize our present fungus to be a species of Cylindrosporium. Up to the present time, I have not yet been able to obtain the ascosporous stage of the fungus both in its natural state as well as in its pure culture.

No species of Cylindrosporium parasitic on the species of Dioscorea has yet been recorded in mycological literatures. Considering the fungus as a new species, the following diagnosis is given.

Cylindrosporium Dioscoreae Miyabe et S. Ito.

Spots amphigenous, at first unbordered, small, yellowish, at last bordered, brown or blackish brown, scattered or gregarious, roundish, polygonal or irregular, often confluent.

Acervuli mostly epiphyllous or hypophyllous, also on vines and petioles, minute, scattered or gregarious, roundish, somewhat elongated on vines, slighty raised, at first covered by the cuticle, brownish or dark brown, finally erumpent above, then whitish, fleshy-colored or pinky white.

Conidiophores simple, straight or slightly curved, smooth, unseptated, granulate,

hyaline, 18-30 × 3-3.5 μ.

Coninia filiform or clavate-cylindrical, mostly curved or straight, rounded at both ends, smooth, guttulate, obscurely septated, 1-4 celled, hyaline, 26-67.5 × 2–3.5 μ.

Hab. On *Dioscorea Batatas* Dcne.

Honshū: —Prov. Rikuchū, Morioka (Sept. 1911. G. YAMADA).

Hokkaidō: —Prov. Ishikari, Sapporo (Sept. 14, 1895. K. MIYABE & J. HANZAWA; Oct. 24, 1904. T. MIYAKE; Oct. 1906; Sept. 1907; Sept.—Oct. 1911. S. ITO)—Shiroishi (Sept. 1907. S. ITO).

Prov. Oshima, Kitamura (Sept. 1, 1905. K. MIYABE)—Yamanaka (Sept. 2, 1905. K. MIYABE).

On *Dioscorea japonica* Thunb.

Kiushū: —Prov. Oki, Nagu, Tōgo (Aug. 1902. E. TOKUBUCHI).

Honshū: —Tokyo (Sept. 1889. K. MIYABE).

Prov. Echigo, Mt. Gomado (Aug. 20, 1908. S. ITO).

Phytopathological Laboratory,
College of Agriculture,
Tōhoku Imperial University,
Sapporo, Japan.

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摘　　要

札幌地方に於けるながいもの葉莖年々 Cylindrosporium に屬する一種の寄生菌の侵害を受け昨秋殊に其害の甚しかりしを認め之れを調査せるに全く未だ世に紹介せられざりし病害菌たるを確むるを得たるにより新に Cylindrosporium Dioscoreae Miyabe et S. Ito なる學名を附したり、本病菌は只ながいもを侵すのみならずやまのいもにも寄生し得るものにして初めて宮部博士がやまのいもの病害標本を東京に於て採集せられしは明治二十二年のことなり其後德淵氏の隱岐島に於て山田敎授の盛岡に於て予の越後に於てやまのいも或はながいもの病害標本を得たるにより其分布區域の廣汎なるを知るに足る、本菌の形態及び性質等は暫く措き其病狀を略記す

れば次の如し。

初め葉の表面に黄色にして限界不明なる小病斑を生じ來り漸次擴大し多數の病斑あるときは互に癒合して一大病斑を作り褐色に變じ遂に乾枯す、該病斑中を精査すれば小なる褐色の小瘤の存するを見る、之れ病菌の菌褥にして後表皮破れて無數の胞子を露出す此胞子多數堆積せるときは肉色又は白肉色を呈す、尙本菌は莖及び葉柄をも侵すものにして被害莖上の嫩葉は初め蚜虫の被害を受けたるが如き觀を呈し裏面に菌褥を生じ遂に枯損して黒褐色を呈す、如斯枯損葉一莖上に多數並列し且つ其被害莖は多少肥大するを以て瞥見直ちに本病の存在を知るを得べし、本病豫防法としてはボルドー合劑の灌注並に病葉の摘去及び收穫後に於ける殘莖の燒却等を可とす。