Miscellaneous Notes on Myriangiales from Japan (1)

By

Eiichi KUROSAWA* & Shigetaka KATSUKI**

1. *Elsinoë broussonetiae* KUROSAWA et KATSUKI sp. nov. (Fig. 1)

Maculis in foliis sparsis, minutis 0.5~1 mm diametro, circularibus vel subcircularibus, epiphyllis vel amphigenis, superne primum brunneis, dein albicantibus, inferne brunneis, prominentes, in

nervis mediis, petiolis et caulibus, ellipsoideis vel elongatis, 3~5 mm, marginis plus minusve elevatis et centro depressis; ascomatibus irregularibus, erumpentibus, 60~80×30~79 μ , pseudoparenchymatosis, superne nigricantibus, asci paucis vel numerosis, ovoideis vel subglobois, 16~22 μ , 4~8 sporis; ascosporis hyalinis 3~4 septatis, ad septa

Fig. 1. *Elsinoë broussonetiae*
A. On upper leaf surface
B. Germination of ascospore on agar
C. Asci and ascospores ($\times 750$)

* Nihon Tokushu Nōyaku Co. Ltd., Kurosawa passed away in march 1953.

** Toa Nōyaku Co. Ltd.

Abbreviations used in the citation of specimens and collectors:

(IB)—Herb. Secção Fitopat. Inst. Biol., São Paulo, Brasil.

(KU)—Herb. Dept. Plant Path. Kyushu Univ., Japan.

(SK)—Herb. Shigetaka Katsuki (Private) Tokyo, Japan.

(YNU)—Herb. Agr. Inst. Yokohama Nat. Univ., Yokohama, Japan.

(NFC)—Herb. National Fungus Collection, Beltsville, Md., U.S.A. (Note. Drs. Bitancourt and Jenkins write me that part of each IB number here cited is deposited NFC.)

E. K. = Eiichi kurosawa

S. K. = Shigetaka Katsuki

leniter constrictis, plerumque cellis centralibus longitudinaliter septatis, rectis vel curvatis 10~13 $\times$ 4~5 μ .

Habitat and distribution: On *Broussonetia kazinoki* SIEB. and *B. papyrifera* (L.) VENT. (Moraceae), Japan (Honshu and Kyushu)

Specimens examined: On *Broussonetia kazinoki* Tokyo Prefec.: Ōsaki, Aug. 7, 1937, E. K. (SK 1382); Kasumi-mura, Aug. 8, 1951, E. K. (SK 1391); Hirayama-mura, Aug. 15, 1951, E. K. (SK 1392) (KU); Koganei, Oct. 26, 1951, E. K. (SK 1393) Ibaragi Prefec.: Niido, Aug. 7, 1938, E. K. (SK 1383); Sept. 24, 1939, E. K. (SK 1388 & 1389) (Type) (KU) (IB); Narado, Aug. 9, 1938, E. K. (SK 1384) (KU); Aug. 17, 1938, E. K. (SK 1385); Aug. 24, 1938, E. K. (SK 1386) (KU) Tochigi Prefec.: Kinugawa, Oct. 2, 1955, S. K. (SK 1303) Chiba Prefec.: Kamaya, Oct. 23, 1938, E. K. (SK 1387) (KU) Kanagawa Prefec.: Nakastu-Keikoku, Nov. 23, 1939, E. K. (SK 1390)

Nagano Prefec.: Naniiai-mura, Aug. 8, 1950, H. Kurata (Herb. H. Kurata 50003) (Ex IB 5682) (NFC 91171) Fukuoka Prefec.: Mikasa-mura, Sept. 16, 1954, S. K. (SK 1394); Mt. Wakasugi, Oct. 28, 1954, S. K. (SK 1395)

On *B. papyrifera* Nagano Prefec.: Naniiai-mura, Sept. 23, 1951, K. Togashi (YNU 24642) (Ex IB 5684) (NFC 90164)

Observation: Enlargement of the veins resulting from infection by *Elsinoë broussonetiae* corresponds to that recorded in the description of *Sphaceloma rhois* on *Rhus verniciflua* STOKES (in this description given as *R. vernix* L.) (1, p. 48 and Est. 15, B. and D).

2. *Sphaceloma caricae* IKATA et KATSUKI sp. nov. (Fig. 2)

Fig. 2. *Sphaceloma caricae*
A. On upper leaf surface
B. Conidia and conidiophores
($\times 750$)

Syn. *Sphaceloma carica* IKATA, Monthly fruit-tree report (Kudamonogeppo), Okayama Prefec. 308: 13~14, 1937. (3) (nom. nud.)

Maculis in foliis parvis, 0.5~1 mm diametro, circularibus vel plus minusve irregularibus, epiphyllis, sparsis, primum brunneis dein griseis vel albis, centro parum depresso; fructificationibus ex conidiophoris fasciculatis, erectis vel leniter curvatis, cylindricis, continuis vel 1-septatis, apice attenuatis, hyalinis vel olivaceis, $8\sim 21 \times 3.3\sim 4.6 \mu$; conidiis globosis vel fusiformibus, continuis vel 1-septatis, hyalinis, $4.6\sim 7.9 \times 2.0\sim 3.9 \mu$.

Habitat and distribution: On *Ficus carica* L. (Moraceae), Japan (Honshu and Kyushu)

Specimens examined: Saitama Prefec.: Hato-gaya, Aug. 20, 1938, E. K. (SK 1067) (Type) (KU); Sept. 9, 1938, E. K. (SK 1068) (KU); Sept. 26, 1938, E. K. (SK 1069) (KU) Tokyo Prefec.:

Gotanda, June 18, 1940, E. K. (SK 1070) (KU); Toyoda, July 29, 1951, E. K. (SK 1071) (KU) Fukuoka Prefec.: Aoyagi-mura, May 15, 1954, S. K. (SK 1072); Kurume city, Sept. 15, 1954, S. K. (SK 1073)

"Fig scab" as IKATA termed, the disease caused by *Sphaceloma caricae* is known throughout the fig-growing districts in Japan. As he stated, however, the malady does not cause severe damage. Adding that the disease is present from June to September, he described the symptoms as follows:

Leaf spots are usually epiphyllous, variable in number, in extreme cases so numerous as nearly covering the leaf, circular or indefinite, at first minute, yellowish white, then as the lesion develops becoming whiter with brown border, and somewhat depressed at the

center, averaging less than 1 mm in diameter. Lesions on petiole and midrib are often oblong with pointed ends, becoming more or less elevated with sunken mid-part, brownish or grayish brown and commonly 1×0.5 mm. Lesions on young stem are similar to those on petioles. Lesions on fruit are scattered, grouped or coalescent, beginning as minute blackish brown spots, gradually becoming grayish white or pale brown with deep brown

border, reaching 0.5 mm in diameter. Old lesions become corky.

3. *Sphaceloma euonymi-japonici*

KUROSAWA et KATSUKI sp. nov. (Fig. 3)

Syn. *Fusicladium euonymi-japonici* HORI, Engeno-tomo 9 (12): 1094~1097, 1913. (2) (nom. nud.)

Maculis in foliis rotundis, plerumque parvis, interdum usque 1~3 mm diametro, amphigenis, centro depressis et saepe perforatis, margine elevatis, brunneis, aliquando confluentibus, in caulibus magnis, elongatis, saepe in areas latas rugosas confluentibus, subrubro-brunneis; acervulis in stromatis continuum, plerumque hypophyllis, conidiophoris dense compactis, continuis vel 1-septatis,

brunneis, $14\sim 28 \times 2\sim 4 \mu$; conidiis fusiformibus vel subfusiformibus, utrinque acute rotundis, olivaceis, continuis vel $1\sim 2$ -septatis, $8\sim 19 \times 3\sim 5.3 \mu$.

Habitat and distribution: On *Euonymus japonicus* THUNB. (Celastraceae), Japan (Honshu and Kyushu)

Specimens examined: Chiba Prefec.: Matsudo, Aug. 14, 1938, E. K. (SK 1399) (Type) (KU);

Fig. 3. *Sphaceloma euonymi-japonici*
A. On leaves and stems
B. Conidiophores and conidia ($\times 1000$)

Sept. 9, 1938, E. K. (SK 1400) Tokyo Prefec.: Matsubara-machi, June 6, 1951, E. K. (SK 1401); Meguro, Sept. 22, 1955, S. K. (SK 1300) Fukuoka Prefec.: Kurume city, Sept. 15, 1954, S. K. (SK 1405)

The character of the fructification on these specimens is typical of *Sphaceloma* (4). For convenience of reference HORI's description (2) of the symptoms of the disease caused by the above mentioned fungus are translated as follows: The fungus attacks living leaves and young stems of *Euonymus japonicus* during the period September to October. It often shows as small circular spots on either side of leaf, which gradually enlarge to $1\sim 3$ mm in diameter. The lesions are sunken at the center and slightly raised at the border. Sometimes numerous spots coalesce forming a larger lesion of irregular shape with a more or less raised reddish brown border. Some lesions have concentric circles. A soot-colored mold may be seen on the surface of the lesions, this being especially abundant on the lower surface. Finally, the lesions drop out from leaves leaving shot holes with reddish brown raised border. Lesions on young stems are similar to those of leaves, but are deeper reddish brown, readily coalescent, and typically scab-like. Occasionally, lesions cover the greater part of stems. When the disease is severe, the leaves fall away and the growth of young shoot is stopped.

4. *Sphaceloma paederiae* KUROSAWA et KATSUKI sp. nov. (Fig. 4)

Maculis in foliis, amphigenis, sparsis vel aggregatis, circularibus vel subcircularibus, interdum

Fig. 4. *Sphaceloma paederiae*
Conidia and conidiophores ($\times 750$)

coalescentibus, minutis, $0.3\sim 0.5$ mm diametro, centro depressis et saepe perforatis, griseo-brunneis, margine elevatis, brunneis; in petiolis et veins, magnis elongatis, usque $1\sim 3$ mm longis; primo brunneis, dein griseo-brunneis, centro nonnihil convexis; acervulis amphigenis, sparsis, intraepidermales, olivaceo-brunneis, $15\sim 30 \mu$ longis, $9\sim$

21 μ crassis; conidiophoris 3~7, rectis vel leniter curvatis, continuis vel 1-septatis, ad bases pallide brunneis, 18~29 $\times$ 2.6~3.0 μ ; conidiis globosis vel fusiformis, continuis raro 1-septatis, hyalinis vel pallide olivaceis, 7.2~16.4 $\times$ 2.0~4.6 μ .

Habitat and distribution: On *Paederia scandens* (LOUR.) MERR. (Rubiaceae), Japan (Honshu and Kyushu)

Specimens examined: Tokyo Prefec.: Gotanda, July 24, 1938, E. K. (SK 1380) (Type) (KU) Ibaragi Prefec.: Itabashi, July 24, 1938, E. K. (Ex IB 5989) (NFC 91068) Yamanashi Prefec.: Near Lake Kawaguchi, July 7, 1951, E. K. (SK 1381) Nagasaki Prefec.: Isahaya Park, June 23, 1955, S. K. (SK 1263)

Acknowledgement

The junior author expresses his sincere appreciation to Dr. A. E. Jenkins and Dr. A. A. Bitancourt for providing facilities for our work and for their many courtesies. (Received March 5, 1956)

Literature cited

- 1) Bitancourt, A. A. and A. E. Jenkins: *Arg. Inst. Biol.*, 11: 45~58. (1940).
- 2) Hori, S.: *Engenotomo*. 9 (12): 1094~1097. (1913). (In Japanese).
- 3) Ikata, S.: Monthly fruit-tree report (Kudamono-geppo) Okayama Prefecture, Japan, 308: 13~14. (1937). (In Japanese).
- 4) Jenkins, A. E. and A. A. Bitancourt *Mycologia*, 33: 338~40. (1941).

文 献 紹 介

ファーマムとナバムの殺菌性に関する諸要因

Weed, R. M., S. E. A. McCallan, & L. P. Miller: Factors associated with the fungitoxicity of ferbam and nabam. *Contrib. Boyce Thompson Inst.* 17: 299~315. (1953). ferbam 及び nabam の如き有機硫黄剤の殺菌性はその分解揮発性物質に帰せられ、其の物質の種類及び化学的性質決定に関する多数の報告があるが未だ結論を得ていない。著者等の実験では S^{35} で標識した ferbam は揮発性 S 化合物を遊離し、*Monilinia*, *Rhizopus*, *Aspergillus* 等の胞子はそれを対照の濾紙片の 10~40 倍のカウント数をもつて吸収し、又棉、豆、トマトの葉も揮発性 S 化合物を吸収し体内移動を行った。 S^{35} 標識 ferbam 懸濁液に根を浸漬したトマトも頂端から放射能を検出した。標識 ferbam を強酸で分解して得られた S^{35} 標識 CS_2 も豆組織に吸収され、移動した。ペーパークロマト法で ferbam と nabam の分解生成物である揮発性 S 化合物が CS_2 と同一のものであることが確められ、吸収された S^{35} は硫酸塩及び有機硫黄部分に見出され CS_2 も植物の代謝に与り得ることを示した。ferbam と nabam の CS_2 生成は pH に関係し、pH 7.0 以下で酸性になるほどその発生が増大し、更に nabam では pH の僅かな変化にも非常に敏感で pH 6.3 から 5.7 になると約 5 倍の CS_2 発生を見たが ferbam ではかかる影響は殆んど認められなかった。 CS_2 発生は又 SH 化合物によつても影響されるが ferbam はグルタチオン、システインにより CS_2 発生が増大し酸化型グルタチオンでは増大せず、

nabam は酸化型グルタチオン、システインにより増大したが還元型では促進されなかった。この細胞必須成分との反応は恐らく ferbam, nabam 等の毒作用に重要なものと思われる。ferbam 処理による *Neurospora* 胞子の発芽回復はグルタチオン、システインでは完全に行われなかった。ferbam は SH 基を含む酵素ウレアーゼの活性を阻害したが nabam は阻害しなかった。これは SH 基が ferbam と反応し nabam と反応しない結果であろう。nabam の揮発性物質と CS_2 蒸気の *Monilinia* 及び *Neurospora* 胞子に対する静菌作用は前者が後者の約 10 倍、殺菌作用は前者が後者の 60~100 倍であつて nabam の蒸気は完全に殺菌的であり胞子の発芽回復はなかつたが CS_2 では相当回復し CS_2 蒸気の毒作用は静菌的であつた。この結果は CS_2 が nabam 蒸気の毒性の主たる因子ではないことを示している。ethylenediamine 蒸気も毒性は低かつたが其の溶液は CS_2 溶液の 10~180 倍の毒性を有していた。揮発性毒物の毒性を減少する種々の吸収剤を用いた試験では CS_2 及び ethylenediamine は共に nabam 液の揮発性物質の毒性に関係がないことを示した。nabam の揮発性物質としては CS_2 の外に SH_2 も報告されており更に未知の揮発性成分が含まれている。又その溶液中には ethylenethiourea, ethylenethiuram monosulfide 及び他の未知物質を含むことが報告されている。ferbam が ferbam として植物体中に入るかどうか疑問であり又植物汁液の pH で不安定であるから植物体中で ferbam そのままの形で存在するとは思われない。(水沢芳名)