Plant Pathology Bulletin 12:212-214, 2003

Phomopsis Fruit Rot of Subtropical Peach in Taiwan

Yeong Ko [1,2], and Shou-Kung Sun [1]

1 Department of Plant Pathology, National Chung-Hsing University, Taichung, Taiwan
2 Corresponding author, E-mail: yeko@dragon.nchu.edu.tw; Fax: +886-4-22853007
Accepted for publication: August 12, 2003.

ABSTRACT

Ko, Y., and Sun, S. K. 2003. Phomopsis fruit rot of subtropical peach in Taiwan. Plant Pathol. Bull. 12:212-214.

Phomopsis fruit rot of subtropical peach was first found in Hsin-She (新社) Township and Tungshish (東勢) Township of Taichung County in June, 1998. Both of peach cultivars, Tainon Honey Peach (*Prunus persicae* cv. *premier*) and Tainon Spring Peach (*P. presicae* cv. *springhoney*), were affected. In the early stage of infection, brownish water-soaked spots appeared on the surface of the nearly-matured fruit. Later, the diseased spots expanded quickly and turned to dirt white with brown edge, while as the inner flesh was rotting completely. Diseased tissue was shrunk due to the lose of water. No sooner, brown-to-black dot like pycnidia grew from the diseased tissue. Causal organism was isolated and Koch's postulate was fulfilled. It was indicated that the causal organism was *Phomopsis mali* Roberts. Phomopsis fruit rot disease of the subtropical peach caused by *P. mali* is a new recorded disease in Taiwan.

Key words: *Phomopsis mali*, Phomopsis fruit rot, peach, new disease.

In June 1998, subtropical peaches showed fruit rot symptom were collected from Hsin-She Township and Tung-Shih Township of Taichung County. Among subtropical peach varieties, Tainon Sweet Honey (*Prunus persicae* cv. *premier*) and Tainon Spring Honey (*P. persicae* cv. *springhoney*), fruit rot symptom were found in high frequence. Lesions appeared on stylar end and other part of the fruit. They were circular, tan to brown in color and expanded quickly, whitish mycelium mass of the causal fungus often occurred in the center part of the lesion (Fig. 1).

Concentric zones of mycelium growth resulted in response of diurnal cycles. Gradually the lesions was shriveled due to the lose of water and sparsely dotted black pycnidia in the center of lesion (Fig. 2).

Isolation of the causal agent was made by taking a small piece of diseased tissue on acidified Difco potato dextrose agar (APDA) plates. After mycelia grew out, picked up a small agar piece with mycelia by a sterilized needle from the edge of the mycelial colony and transferred into the PDA slant, and incubated at 25 ±1℃ for further identification.

Two isolates from peach and two of each isolate of *Phomopsis mali* from apple [(9)] and pear [(10)], respectively, were used in this study. Culture characters were compared by removing 5-mm mycelial discs from the margins of actively growing cultures and placing at the center of PDA plates. All of two peach isolates and *P. mali* from apple and pear developed profusely whitish color but gradually turn to chalk-white to gray flocculent mycelium with orange-yellow sporodochia scattered on the colony. Black pycnidia produced on PDA culture under continuous light after incubating for 9-14 days at 24-28℃(Fig. 3). Conidiophores were hyaline, cylindrical, sparingly branched, and sepatate at the base, with one or two septa. Conidia were hyaline, 1-celled, of two types (Fig. 4); Alpha conidia (7.0-10.0×2.5-3.5 μm) are hyaline, fusiform, straight with slightly acuminate ends and unicellular. Beta conidia (14.5-37.5×1.2-2.6 μm) are filiform, curved and bent. The size of alpha and beta conidia of peach isolate was almost similar to that of apple isolate (α-conidia: 5-10×2.3-4.0 μm, and β-conidia: 15.0-37.5×1.3-2.5 μm) and pear isolate (α-conidia: 7.5-11.0×2.5-3.0 μm and β-conidia: 14.5-38.2×1.2-2.6 μm).

The pathogenicity test was conducted either with one 5-mm mycelial mat or with 0.2-ml 10^5 conidia/ml spore suspension. Mycelial discs were cut from 3-day-old PDA culture with a 5-mm sterilized cork borer. A spore suspension was prepared by scraping alpha conidia from 2-wk-old PDA slant cultures, blended and diluted to 10^5 conidia/ml. Mature fruits of two peach varieties, Tainon Sweet Honey and Tainon Spring Honey, were surface-sterilized with 0.525% sodium hypochlorite, rinsed with sterilized water, and air dried. Fruit were wounded with a bunch of 4-needle head on 6 locations per fruit and inoculated with mycelial discs and spore suspension, respectively. The inoculated fruits were loosely wraped with moist tissue paper and separately put in polyethylene bags. Four replications of each treatment were conducted in incubater at 24-28℃. Disease symptoms similar to those found in field were produced in all inoculated fruits 3 days after inoculation, but not in noninoculated fruits which

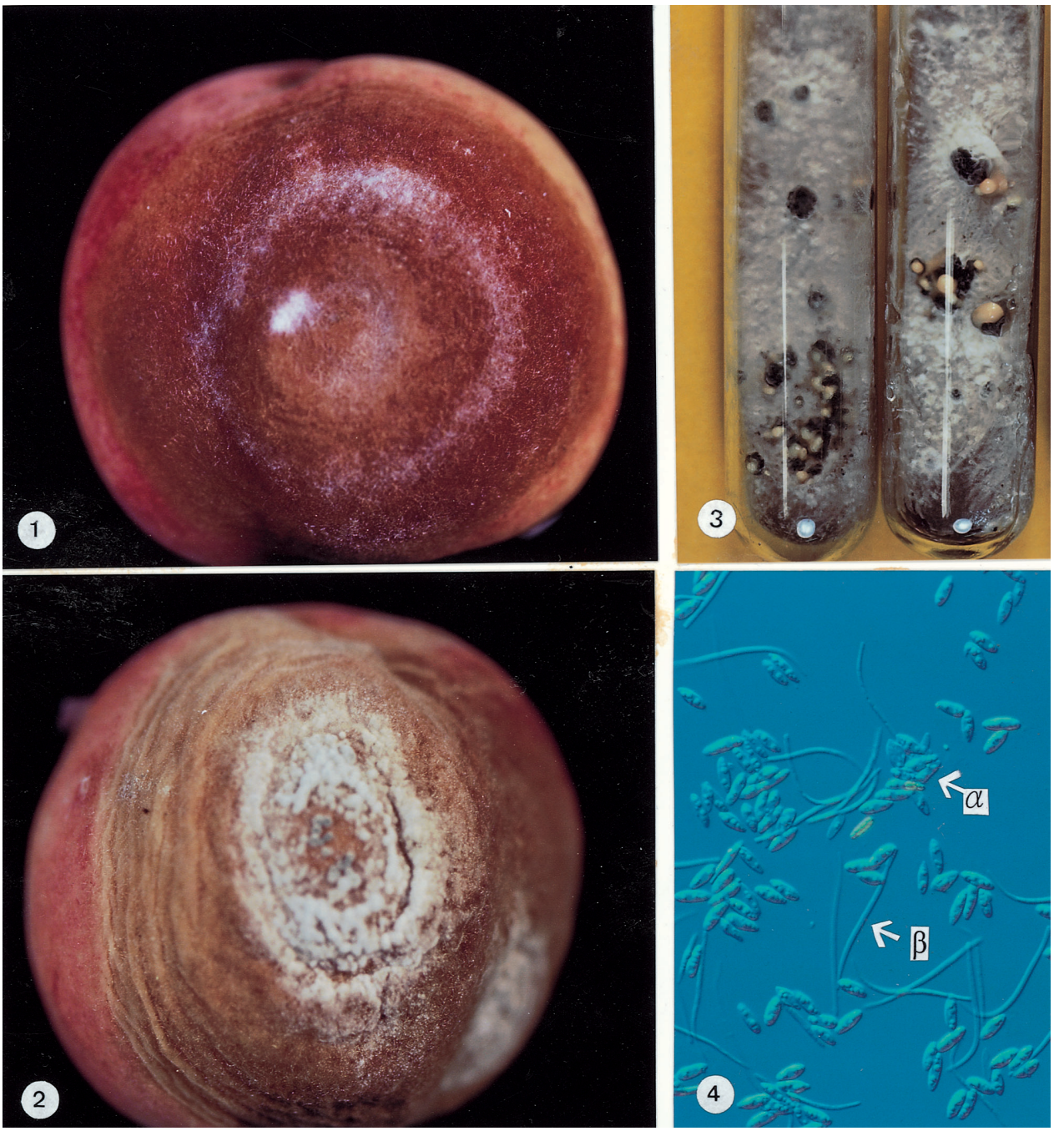

Fig. 1-2. Symptoms of fruit rot of peach caused by *Phomopsis mali*: (1) in the middle stage of disease development, showing circular, brown lesion on infected fruit; (2) in the late stage of disease development, lesion was shriveled due to the lose of water and sparsely dotted black pycnidia in the center of lesion.
Fig. 3. Conidial mass of *Phomopsis mali* as pale yellowish tendrils on PDA slant.
Fig. 4. Conidia (α-spores) and stylospores (β-spores) of *Phomopsis mali* from culture.

were wounded but without inoculum. Reisolation from inoculated fruits showing symptoms yielded *Phomopsis* sp. indicating that the tested fungus was the causal agent. Reciprocal inoculations with isolates from peach, apple and pear were conducted to peach, apple and pear fruits and got positive result. From above tests, the fungus isolated from Phomopsis fruit rot of peach was identical to *P. mali* from apple and pear.

Phomopsis mali has been previously reported as the causal agent of fruit spot of apple [9] and stem-end rot of pear[10] in Taiwan. In 1913, *P. mali* was first reported as the causal agent of rough bark disease of Yellow Newton apples in the United State [12]. *P. mali* also caused stem-end rot of apples during storage [3,4,7,8,11,13], fruit decay of peaches and apples [5,14,15], fruit spot of apples [9], postharvest disease of peaches [5,14,15] and pears [10]. Phomopsis leaf spots [6], tree cankers [2,6,8,14] and a die-back of stone fruit trees [1,8] have evidently been more common. *Diaporthe perniciosa* Em. Marchal has been proved as the teleomorph stage of *P. mali*[6,9]. This is the first report for the occurrence of fruit rot of subtropical peach caused by *P. mali* in Taiwan.

LITERATURE CITED

1. Cayley, D. M. 1923. Fungi associated with "die-back" in stone fruit trees. Ann. Appl. Biol. 10:253-275.
2. Chupp, D., and Clapp, G. L. 1923. Fusicoccum canker on apples. Phytopathology 13:225-230.
3. Colhoun, J. 1983. Fungi causing rots of apple fruits in storage in Northern Ireland. Ann. Appl. Biol. 25:88-99.
4. Combrink, J. C., Commer, N. F., Tyler, R. H., and Fortlage, R. J. 1976. Postharvest Phomopsis rot of apple fruits. Plant Dis. Rep. 60:1060-1064.
5. Daines, R. H., and Peterson, J. L. 1976. The occurrence and control of Phomopsis rot of peach. Plant Dis. Rep. 60:141-143.
6. Dunegan, J. C. 1932. The occurrence of the perfect stage of *Phomopsis mali* in the United States. Phytopathology 22:922-924.
7. Jones, A. L., and Aldwinckle, H. S. 1990. Compendium of Apple and Pear Diseases. APS press, St. Paul, MN. 100 pp.
8. Kidd, M. N. and Beaumont, A. 1924. Apple rot fungi in storage. Trans. Br. mycol. Soc. 10:98-118.
9. Ko. Y., Sun, S. K., and Kuo, M. S. 1994. Phomopsis fruit spot of apple in Taiwan, Plant Prot. Bull. 36:75-80.
10. Ko, Y., Sun, S. K., and Kuo, M. S. 1995. Stem-end rot of pear in Taiwan. Plant Prot. Bull. 37:223-225.
11. Nawawi, A., and Swinburne, T. R. 1979. Observations on the infection and rotting of apple var. Bramley's Seeding by *Diaporthe perniciosa*. Ann. Appl. Biol. 66:245-255.
12. Roberts, J. W. 1913. The "rough bark" disease of Yellow Newtown apple. U. S. Dept. Agric. Bur. Plant Ind. Bull. 280. 18 pp.
13. Rosenberger, D. A., and Burr, T. J. 1982. Fruit decays of peach and apple caused by *Phomopsis mali*. Plant Dis. 66:1073-1075.
14. Smith, M. A., and Ramsey, G. B. 1957. Fruit decay and twig canker on peach. Phytopathology 47:445-446.
15. Terui, M., and Harada, Y. 1968. On *Phomopsis mali* causing "Jikugusare" disease of apples. Bull. Fac. Agric. Hirosaki Univ. 14:43-46. (Rev. Appl. Mycol. 47:3151, 1968).

摘 要

柯勇[1,2]、孫守恭[1]. 2003. 台灣亞熱帶桃果腐病. 植病會刊12:212-214. ([1.] 台中市國光路250 號 國立中興大學植物病理學系；[2.] 聯絡作者，電子郵件 yeko@dragon.nchu.edu.tw，傳眞：+886-4-22853007)

1998 年 6 月，於台中縣新社鄉及東勢鎮地區之台農甜蜜桃及台農春蜜桃之品種上，發現桃果發病初期，於果實表面出現褐色水漬狀斑點，隨後病斑繼續擴大，變成「污白色」，邊緣褐色，果肉腐爛。後期病組織失水而皺縮，其上密生污白色至黑色小點，此爲病原菌之柄子殼。從果實罹病組織部份進行病原菌之分離、培養，並依柯霍氏法則測定病原菌之病原性後，證明亞熱帶桃之果腐病的病原菌是 *Phomopsis mali* Roberts non (Schulzer & Sacc.) Died。本文描述與記載本省亞熱帶桃果腐病的病徵。

關鍵詞：*Phomopsis mali*、桃果腐病、亞熱帶桃、新病害