Concave Rot of Melon Fruit Caused by Two *Phomopsis* Fungi

Takashi OHSAWA* and Takao KOBAYASHI**

Abstract

Many isolates belonging to the genus *Phomopsis* were obtained from the concave rot of melon fruit, *Cucumis melo*, a new postharvest disease. They were divided into four groups of A, B, C and D according to their cultural characters on PSA. Several representative isolates selected from each type of isolates showed clear pathogenicity to melon fruits. Morphologically, isolates were divided into two groups; one having shorter β -conidia and containing colony groups of A and B, and the other having longer β -conidia and containing colony groups C and D. Some isolates of the former group produced perithecial stage on PSA and also on water agar plate containing a fragment of melon fruit. A new variety of *Diaporthe melonis* Beraha et O'Brien, *D. melonis* var. *brevistylispora* Kobayashi et Ohsawa was proposed for the fungus. Although the isolates of the latter did not produce any perithecia on artificial media mentioned above, these were identified as the conidial stage of *Diaporthe melonis* Beraha et O'Brien var. *melonis*, *Phomopsis cucurbitae* McKeen sensu Behara et O'Brien.

(Received January 5, 1989)

Key words: concave rot, melon fruit, postharvest disease, *Diaporthe melonis* var. *brevistylispora*, *Phomopsis cucurbitae*, *Phomopsis brevistylispora*.

INTRODUCTION

Since 1981, occurrence of a new postharvest disease of netted melon (*Cucumis melo* L.), which was harvested at greenhouses in Shizuoka Prefecture, was frequently noticed in the markets. The disease was characterized by making round concave on fruit surface, and a lot of *Phomopsis*-isolates were obtained from the rotted fruits at high rate.

The present paper deals with the diagnose of the disease, isolation of associated fungi from the diseased fruits, pathogenicity of *Phomopsis*-isolates, and morphology and taxonomy of the causal *Phomopsis*. Parts of the result were preliminarily and orally published^{2,3)}.

DISEASE

Symptoms and disease occurrence

The disease usually begins to form small round patches on the surface of fruits 7 to 10 days after harvesting and marketing. These patches are at first 2~7 mm in diameter and water-soaked pale green in color, then enlarge to 20~60 mm in diameter and produce somewhat sunken concaves just beneath the netty ornament of fruit surface (Fig. 4, A~C). Diseased fruits become soft and rotten, although no hyphae and mycelia are recognized externally on them.

Questionnaires concerning with the occurrence of the concave rot of melon fruits, at markets

* Shizuoka Prefectural Agricultural Experiment Station, Toyoda-cho, Iwata-gun, Shizuoka 438, Japan
静岡県農業試験場

** Forestry and Forest Products Research Institute, Kukisaki-cho, Inashiki-gun, Ibaraki 305, Japan
森林総合研究所

in Tokyo and Osaka, were collected in 1985 from 16 wholesalers and the result was given in Fig. 1. The occurrence of concave rot of melon fruit was frequently recorded on the fruits brought to the markets from June through October. Close relation between cloudy and rainy weather during the period of net formation and high frequency of disease occurrence was noted. However, it is quite difficult to diagnose the disease appearance before marketing, because any abnormal symptoms could not be recognized on the fruit surface just after harvesting.

CAUSAL FUNGI

Isolation of associated fungi

Isolation tests from the rotted patches of fruits were repeatedly carried out from 1981 to 1985. Small pieces obtained from the diseased skin were placed onto potato-sucrose agar (PSA) plate after surface sterilization by 80% ethanol. The plates were kept for about 10 days at 25 C. Hyphae grown from the diseased tissue were transplanted to PSA slants and again kept in an incubator regulated at 25 C.

As shown in Table 1, total 66 diseased fruits were used for isolation experiments. Out of 79 isolates obtained, 77 (97%) belonged to the genus *Phomopsis*, and remaining 2 (3%) did to the genus *Fusarium*. Based on the growth type of colonies on PSA plate, these *Phomopsis*-isolates were divided into 4 groups. Isolates called group A developed flat and radial mycelial colonies. Colony of group B-isolates was similar to that of group A but had more hairy to fibriform aerial mycelia than the latter. Isolates belonging group C formed slightly zonate colonies. Colony of group D-isolates showed distinctly concentric zones (Fig. 4, D~G). Group A- and D-isolates accounted for 54% and 29% of 79 isolates, respectively. Isolation rates of group B- and C-isolates were relatively low.

Fig. 1. Frequency of monthly record on the occurrence of concave rot of melon fruits in 1985.

Table 1. Isolation of fungi from concave rot lesions of melon fruits

Year	Fruit tested	Lesion isolated	Isolates obtained	<i>Phomopsis</i> ^{a)}				<i>Fusarium</i>
				A	B	C	D	
1981	8	8	8	6	0	0	2	0
1982	6	6	6	3	0	0	3	0
1983	13	13	15	10	0	0	3	2
1984	22	22	22	10	1	1	10	0
1985	17	28	28	14	5	4	5	0
Total	66	77	79	43	6	5	23	2
Percentage			100	54	8	6	29	3

a) Growth type of colony = A: flat, B: hairy, C: slightly zonate, D: concentric.

Pathogenicity of Phomopsis-isolates

To confirm the pathogenicity of the *Phomopsis*-isolates obtained to melon fruits, several inoculation tests were conducted. The first inoculation series were planned to clear the time of infection concerning with the different growth stages of fruit. Selected 8 isolates consisting of 5 of group A (S-1, 4, 6, 8 and 61) and 3 of group D (S-2, 7 and 69) were used as inoculum. Each of fruits at the different growth stage was wounded 1, 3 or 5 portions with a sterilized knife and inoculated with a piece of colony of the isolate at each wound. They were then covered individually with a polyethylene bag which was removed after 3 days. Immature inoculated fruits growing on vines were kept in greenhouse until their maturity. After harvest, the fruits were placed on the experimental bench in laboratory and disease development was continuously observed. Fruits inoculated after harvesting, were also kept in laboratory to observe the appearance of the disease. Fruits used for the control were treated as same as to those for inoculation except the usage of agar piece instead of fungus inoculum.

Results were given in Table 2. In every cases of inoculation against the fruits before harvest, no disease development was observed until the optimal harvesting time. Lesions developed on all inoculated fruits within 3 to 10 days after harvest, and patches of typical concave rot were produced on them. No relations between the time of inoculation to the fruit, in other words, between growth stage of fruit inoculated and time and rate of disease development were recognized. Of course, inoculation to the harvested fruits was succeeded at a high rate. Generally, it might be said that the pathogenicity of the *Phomopsis*-isolates belonging growth type A and D was not different from each other.

The second inoculation series was planned to confirm the pathogenicity of *Phomopsis*-isolates belonging to every growth type of culture. Method of inoculation was the same as that in the first series. Three points on a fruit were wounded and inoculated with an isolate. In total 35 isolates were used in this test. Result was given in Table 3. Every growth types of

Table 2. Inoculations of melon fruits at different growth stages with *Phomopsis*-isolates from concave rot of melon fruit

Year	Date of inoculation	Growth type of colony	Number of isolate used	Fruits Wounds		Diseased fruits		Lesions developed
				inoculated		before harvest	after harvest	
1982	July 1 ^{a)}	A	4	12	36	0	9 (75%)	25 (69%)
		D	1	2	6	0	2 (100)	6 (100)
		Control	—	3	9	0	0 (0)	0 (0)
	July 14 ^{b)}	A	4	12	60	0	9 (75)	45 (75)
		D	2	6	30	0	3 (50)	15 (50)
		Control	—	3	15	0	0 (0)	0 (0)
1983	Sept. 9 ^{c)}	A	3	18	18	0	8 (44)	8 (44)
		D	1	6	6	0	3 (50)	3 (50)
		Control	—	6	6	0	0 (0)	0 (0)
	Sept. 24 ^{d)}	A	3	18	18	0	2 (11)	2 (11)
		D	1	6	6	0	3 (50)	3 (50)
		Control	—	6	6	0	0 (0)	0 (0)
1982	July 2 ^{e)}	A	4	8	40	—	5 (63)	19 (48)
		D	1	1	5	—	1 (100)	5 (100)
		Control	—	2	10	—	0 (0)	0 (0)
1986	June 18 ^{e)}	A	3	6	18	—	6 (100)	16 (89)
		D	2	4	12	—	4 (100)	10 (83)
		Control	—	2	6	—	0 (0)	0 (0)

- a) Twenty-eighth day after pollination; late stage of net formation, b) Forty-first day after pollination; after net formation, c) Seventeenth day after pollination; early stage of net formation, d) Thirty-second day after pollination; after net formation, e) Just harvested.

Phomopsis-isolates could develop the concave rot lesions on melon fruits after harvesting, on which inocula were placed on wounded skins at the net formation stage.

The third inoculation series were carried out to confirm the pathogenicity of *Phomopsis*-isolates against the other parts of melon besides fruits. Seven isolates consisting of 5 of group A (S-1, 4, 6, 8 and 61) and 2 of D (S-7 and 69) were used in this experiment. Result were shown in Table 4. Isolates of *Phomopsis* originated from melon fruits could not develop any spot on leaves even though through wound, and on sound vines. They could develop necrotic lesions only when they were inoculated through the cut end of vines or petioles.

From these inoculation experiments, it must be emphasized that most isolates of *Phomopsis* obtained from the concave rot of melon fruits showed definite pathogenicity to melon fruits with no relation to the different growth type of colonies, and that they could infest the melon fruit before harvest, probably during the net formation stage, and develop the concave rot after harvest (Fig. 5, A-C).

Productivity of pycnidial and perithecial stages on culture of Phomopsis-isolates

All *Phomopsis*-isolates obtained from the concave rot of melon fruits were cultured on PSA plates under black light blue fluorescent lamp (BLB) for one month. All isolates produced α -conidia and 33 isolates out of 40 produced β -conidia as shown in Table 5 and Fig. 5, G and H. Among 20 isolates of group A examined 17 isolates produced perithecial masses with black long beaks and only 2 (S-61 and 70) could produce mature asci and ascospores assigned to those of the genus *Diaporthe* (Fig. 5, D-F).

Besides PSA, water agar plate containing a piece of melon fruit were also used for the experiment to produce pycnidia and perithecia. These plates were irradiated BLB for one month. Among many isolates forming perithecial masses, 4 (S-61, 64, 65 and 75) produced mature asci and ascospores of *Diaporthe* on this medium. All isolates of *Phomopsis* producing mature perithecia on agar media belonged to the group A based on the growth type of colony (Table 5).

Table 3. Inoculation of melon fruits at the net formation stage^{a)} with *Phomopsis*-isolates from concave rot of melon fruits

Growth type of colony	Isolates		Wounds inoculated	Lesions developed	
	used	positive		before harvest	after harvest ^{b)}
A	17	10 (59%)	51	0 (0%)	18 (35%)
B	6	5 (83)	18	5 (28) ^{c)}	12 (67)
C	4	4 (100)	12	0 (0)	9 (75)
D	8	4 (50)	24	0 (0)	9 (38)
Control	—	—	6	0 (0)	0 (0)

a) May 20, 1986; 20th day after pollination, b) Period from harvest to disease development was recorded from 5 to 10 days. c) Lesions developed in greenhouse.

Table 4. Pathogenicity of *Phomopsis*-isolates from concave rot of melon fruits to cut vines of melon^{a)}

Growth type of colony	Leaf ^{b),c)}		Vine unwounded ^{c)}	Cut end of	
	unwounded	wounded ^{d)}		petiole ^{c)}	vine ^{b),c)}
A	—	—	—	+ ^{a)}	+~++
D	—	—	—	+	+~++
Control	—	—	—	—	—

a) Piece of colony was used as an inoculum, b) July 6, 1982, c) Sept. 21, 1988, d) Ten pin holes per one leaf were inoculated, e) +: Browning, ++: strongly browning.

Table 5. Conidium and ascospore productivity on artificial media in *Phomopsis*-isolates from concave rot of melon fruits

Growth type of colony	Number of isolates used	Productivity of conidia on				Productivity of ascospore on	
		WA-Fruit ^{a)}		PSA		WA-Fruit	PSA
		α	β	α	β		
A	20	20 (++~++++) ^{b)}	18 (+~++++)	19 (+~++++)	17 (+~++++)	4	2
B	6	6 (++~++++)	1 (+)	6 (+++)	4 (+)	0	0
C	4	4 (+++)	0 (-)	2 (+++)	1 (+)	0	0
D	10	10 (+++)	10 (+~++++)	8 (+++)	4 (+~++++)	0	0
Total	40	40	29	35	26	4	2

a) Water agar with a piece of fruit, b) -: none, +: a few, ++: many, +++: abundant.

Table 6. Sizes of α - and β -conidia in each group of *Phomopsis*-isolates from melon fruit

Growth type of colony	Number of isolates measured	α -conidium (μ m) (average)	β -conidium (μ m) (average)
A	10	5~9×1.5~3 (6.4×2.1)	10~23×0.7~1.3 (16.6×0.9)
B	4	4.5~9.5×1~2 (6.4×1.5)	10~20.5×0.8~1.1 (14.5×0.7)
C	2	5~8×1~2.5 (6.4×1.7)	14~27×0.5~1.1 (20.2×0.8)
D	7	4~9×1~3 (6.1×2.0)	16~34×0.6~1.8 (24.7×0.9)

Morphology of the causal fungus

Morphological characteristics of pycnidial stage of *Phomopsis*-isolates causing concave rot of melon fruits were examined. Fruits bodies produced in the previous experiments (Table 5) were observed and their spore sizes were measured. Natures of pycnidia and stroma were not different among 4 groups of isolates. Sizes of their α - and β -conidia were shown in Table 6 and Figs. 2 and 3. No difference in the size and shape of α -conidium was recognized among 4 groups of *Phomopsis*-isolates (Table 6, Fig. 2). However, in sizes of β -conidium isolates were divided into two groups. Sizes of β -conidia of the isolates belonging to the groups A and B were definitely shorter than those of isolates belonging to the groups C and D (Table 6, Fig. 3).

Dimensions of perithecial and pycnidial stages in 4 *Diaporthe* specimens produced on artificial media are given in Table 7. No critical difference was recorded in their sizes of asci, ascospores, α -conidia and β -conidia among 4 isolates producing both of *Diaporthe* and *Phomopsis* stages. This is reasonable, because all isolates maturing *Diaporthe* stage belonged to the same group in their growth type of colony.

IDENTIFICATION AND DESCRIPTION

Taxonomy of the causal *Phomopsis* and *Diaporthe*

From the facts mentioned above, it might be said that *Phomopsis*-isolates causing the con-

Fig. 2. Histogram of sizes of α -conidia produced on PSA slant culture of *Phomopsis*-isolates from concave rot of melon fruits. (—: 600 conidia of colony groups A and B were measured; .....: 370 of groups C and D).

Fig. 3. Histogram of sizes of β -conidia produced on PSA slant culture of *Phomopsis*-isolates from concave rot of melon fruits. (—: 558 conidia of colony groups A and B were measured; .....: 338 of groups C and D).

cave rot of melon fruit were divided into two groups based on the sizes of their α - and β -conidia. One is composed of the isolates listed as groups A and B in their growth type of colony, and the other is of those as groups C and D. The former group of isolates has β -conidia commonly shorter than $20 \mu\text{m}$ and those conidia of the latter group are longer than $20 \mu\text{m}$ (Table 6).

Only a species of the genus *Diaporthe*, *D. melonis* Beraha et O'Brien 1979, has hitherto been reported to be parasitic to melon, *Cucumis melo* L. It has a conidial stage of *Phomopsis* causing soft rot of cantaloupe melon fruits. Beraha and O'Brien¹² tentatively identified it as *Phomopsis cucurbitae* McKeen. Perithecial stage of *Diaporthe melonis* was produced on a sterilized stem of *Glottidium* sp. and they treated this specimen as holotype of their new species.

As shown in Table 7, Figs. 3 and 4, morphological characteristics of perithecia, asci and ascospores in Japanese *Diaporthe* produced on agar media coincided to those of *Diaporthe melonis*. However, the sizes of β -conidia in Japanese *Diaporthe* were distinctly shorter than those of *D. melonis*. On the other hand, sizes of α - and β -conidia of *Phomopsis*-isolates belonging to cul-

Table 7. Comparison of dimensions between Japanese^{a)} and North American *Diaporthe* fungi causing fruit rot of melon

Species	Ascus (μm) (average)	Ascospore (μm) (average)	α -conidium (μm) (average)	β -conidium (μm) (average)
<i>Diaporthe</i> sp. (S-61)	25~38×4~6 (32×5.2)	7.5~10×2~3 (8.6×2.8)	5~9×2~3 (6.9×2.3)	12~20×2~1.5 (16.5×1.2)
<i>Diaporthe</i> sp. (S-61)	21~39×3~6 (31.4×4.8)	7.5~9×2~3 (8.3×2.8)	5.5~7.5×2~2.5 (6.6×2.3)	11~20×0.5~1.2 (15.3×1)
<i>Diaporthe</i> sp. (S-65)	21~35×3~5 (28.4×4.1)	8~9.5×2.5~3 (8.5×2.7)	5~8×1.5~2.5 (6.4×2)	14~20×1~1.2 (16.8×1.1)
<i>Diaporthe</i> sp. (S-75)	25~35×4.5~6.5 (31×5)	7.5~10×2.5~4 (8.9×2.9)		
<i>D. melonis</i>	25~36×3.5~6 (30.8×4.8)	7~11×2~4.5 (9.6×3.1)	6~10×2~3 (8.3×2.6)	18~28×1~2 (24.7×1.3)
<i>Phomopsis</i> sp. (Growth type D and C)			4~9×1~3 (6.2×1.9)	14~34×0.5~1.8 (23.8×0.9)

a) All isolates of Japanese *Diaporthe* belonged to culture group A, b) Perithecia matured on plane agar with a fragment of melon fruit, c) Perithecia matured on PSA, d) Beraha and O'Brien (1979).

ture groups C and D were quite identical with those of the *Phomopsis* stage of *Diaporthe melonis*. Therefore, a new variety of *Diaporthe melonis* is proposed for the Japanese *Diaporthe* causing concave rot of melon fruit as *D. melonis* Beraha et O'Brien var. *brevistylispora* Kobayashi et Ohsawa. *Phomopsis*-isolates belonging to culture types C and D were identified as the conidial stage of *Diaporthe melonis* Beraha et O'Brien var. *melonis*, *Phomopsis cucurbitae* McKeen sense Beraha et O'Brien. Technical description is as follows:

Diaporthe melonis Beraha et O'Brien var. *brevistylispora* Kobayashi et Ohsawa, var. nov.

Anamorph: *Phomopsis brevistylispora* Kobayashi et Ohsawa, nom. nov.

Perithecia in agar aequaeo cum fragmento melonis vel in agar sucroso-decocto tuberosi formata, saepe caespitosa, in textura carbonacea stromatica submersa; ostiola in collum elongatum producta, 0.5~2 mm longa; asci octospori sessile, cylindracei, ad basim attenuati, 21~39×3~6.5 μm , plerumque 25~35×3.5~6 μm , medio 30.4×4.7 μm ; ascosporae irregulariter biseriatae, hyalinae, ellipsoideae, bicellulares, 7.5~10×2~4 μm , plerumque 8~9×2.5~3 μm , medio 8.5×2.7 μm ; pycnidia numerosa irregulariter in agar dispersa, plerumque solitaria, stromatica, ostiolata, unilocularia 150~680 μm latis, 120~560 μm alta; α -conidia unicellularia, fusiformia, hyalina, 4~9.5×1~3 μm ; β -conidia unicellularia, hyalina, filiformia, ad extremum unum curvata, 10~23×0.4~1.3 μm .

Holotype: dried specimen of agar plate colony containing mature perithecia, isolates FF-PRI: LFP-DB-41 (TFM: FPH-7097).

Isolates: on water agar medium containing a fragment of melon fruit, isolated from the diseased fruit of *Cucumis melo* L.—Asaba, Shizuoka Pref., Nov. 13, 1985, by T. Ohsawa (FF-PRI: LFP-DB-41, Type culture); Osuka, Shizuoka Pref., Nov. 13, 1985, by T. Ohsawa (FFPRI: LFP-DB-42). *Phomopsis* state only—Fukuroi, Shizuoka Pref., Oct. 29, 1985, by T. Ohsawa (FFPRI: LFP-PB-137); Asaba, Shizuoka Pref., Nov. 13, 1985, by T. Ohsawa (FFPRI: LFP-PB-140, PB-141, PB-144). All isolates listed here will be registered to MAFF in 1989.

Perithecia on water agar containing a fragment of melon fruit and on potato sucrose agar, gregarious in black stroma, with a long beak; beaks black, 0.5~2 mm in length; asci 8-spored, oblong, hyaline, tapering toward the end, 21~39×3~6.5 μm , mostly 25~35×3.5~6 μm , and 30.4×4.7 μm in average; ascospores irregularly biseriatae, hyaline, 2-celled with a median septum, 7.5~10×2~4 μm , mostly 8~9×2.5~3 μm , and 8.5×2.7 μm in average; pycnidia irregularly

Fig. 4. Concave rot of melon fruit (1). A: Disease development on harvested melon fruits, B: Magnified symptom of the concave rot, C: Cross section of the diseased fruit showing soft rot beneath the skin, D~G: Colony type of *Phomopsis*-isolates obtained from the diseased fruits (D: Group A, E: Group B, F: Group C, G: Group D).

Fig. 5. Concave rot of melon fruit (2). A: Disease development on inoculated melon fruit (Inoculum: Isolate S-70, A type), B: Ditto (Inoculum: Isolate S-7, D type), C: Control (Burning wound inoculation), D and E: Grouped beaks of mature perithecia produced on PSA (Isolate S-61, A type), F: Ascus of *Diaporthe melonis* var. *brevistylispora* containing 8 ascospores (phase contrast), G: α - and β -conidia of *Diaporthe melonis* var. *brevistylispora* (Anamorph: *Phomopsis brevistylispora*), G: α - and β -conidia of *Diaporthe melonis* var. *melonis* (Anamorph: *Phomopsis cucurbitae* McKen sensu Beraha et O'Brien).

scattered on PSA or on sterilized vine, unilocular in stroma, $150\sim 680\ \mu\text{m}$ in diam., $120\sim 560\ \mu\text{m}$ in height; α -conidia unicellular, fusoid, hyaline, $4\sim 9.5\times 1\sim 3\ \mu\text{m}$, mostly $5.5\sim 7.5\times 1.5\sim 2.5\ \mu\text{m}$, and $6.5\times 1.9\ \mu\text{m}$ in average; β -conidia unicellular, filiform or hooked, $10\sim 23\times 0.4\sim 1.3\ \mu\text{m}$, mostly $14\sim 17\times 0.7\sim 1.1\ \mu\text{m}$, and $15.9\times 0.9\ \mu\text{m}$ in average.

Phomopsis cucurbitae McKeen sensu Beraha et O'Brien, Phytopath. Z. 94: 205, 1979 (the conidial stage of *Diaporthe melonis* Beraha et O'Brien var. *melonis*)

Pycnidia irregularly scattered on PSA or on sterilized vines, unilocular in stroma; α -conidia one-celled, fusoid, hyaline, $4\sim 9\times 1.5\sim 3\ \mu\text{m}$, mostly $5.5\sim 7\times 1.5\sim 2\ \mu\text{m}$, and $6.2\times 1.9\ \mu\text{m}$ in average; β -conidia unicellular, hyaline, filiform or hooked, strongly curved, $14\sim 34\times 0.5\sim 1.8\ \mu\text{m}$, mostly $19\sim 28\times 0.7\sim 1.0\ \mu\text{m}$, and $23.8\times 0.9\ \mu\text{m}$ in average.

Isolates: on PSA and water agar containing a fragment of melon fruit isolated from the diseased fruit of *Cucumis melo* L.—Mori, Shizuoka Pref., Sept. 29, 1985, by T. Ohsawa (FFPRI: LFP-PB-138); Fukuroi, Shizuoka Pref., Nov. 13, 1985, by T. Ohsawa (FFPRI: LFP-PB-139); Toyoda, Shizuoka Pref., Oct. 18, 1985, by T. Ohsawa (FFPRI: LFP-PB-142); Shizuoka Pref., Oct. 6, 1984, by T. Ohsawa (FFPRI: LFP-PB-143).

Literature cited

1. Beraha, L. and O'Brien, M.J. (1979). Phytopath. Z. 94: 199–207.
2. Ohsawa, T. and Kobayashi, T. (1988). Ann. Phytopath. Soc. Japan 54: 69 (Abstr. in Japanese).
3. Ohsawa, T., Morita, H., Furuki, I. and Suzuki, H. (1983). Ibid. 49: 397–398 (Abstr. in Japanese).

和 文 摘 要

大沢高志・小林享夫：メロンの果実腐敗を起こす新病害陥没病とその病原菌

1981 年以来、静岡県産のネットメロン果実に、収穫・出荷後、円形の淡褐色水浸状の軟腐陥没を伴う果実腐敗が発生し、新病害として問題となった。発生は 6～10 月出荷のものに多く、病斑上での子実体形成はきわめてまれだが、病患部からの分離では、少数 (3%) の *Fusarium* 属菌を除き、圧倒的に *Phomopsis* 属菌が検出 (97%) された。これらの *Phomopsis* 属菌の分離株は PSA 上での培養菌叢の特徴から A, B, C および D 群の 4 グループに分けられたが、いずれの群の菌株も人工接種による病徴の再現性が確認され、病原菌であることが立証された。感染期は生育中の果実ネット形成期と考えられ、発病はほとんど収穫後 4～5 日以降である。病原菌の α - および β -胞子の形態調査から、これらの *Phomopsis* 属菌は β -胞子の大きさにより明らかに 2 群に区別できた。ひとつは培養群 A および B に属するもので、 β -胞子の長さが $20\ \mu\text{m}$ 以下であり、他のひとつは培養群 C および D に属する菌で、 β -胞子の長さが $20\ \mu\text{m}$ 以上のものであった。分離菌株を各種培養条件のもとで完全世代形成を試みたところ、A 群の 4 菌株が PSA 上あるいは果皮片加用素寒天培地上で *Diaporthe* 世代を完熟した。これらの *Diaporthe* 属菌と *Phomopsis* 属菌の形態的特徴を検討した結果、A および B 群の *Diaporthe* および *Phomopsis* 属菌をそれぞれメロン果実上の既知種 *Diaporthe melonis* Behara et O'Brien の新変種 *D. melonis* var. *brevistylispora* Kobayashi et Ohsawa と記載し、C および D 群の *Phomopsis* 属菌を *Diaporthe melonis* Beraha et O'Brien var. *melonis* の不完全世代である *Phomopsis cucurbitae* McKeen sensu Beraha et O'Brien と同定した。