

Newly Recorded Problematic Plant Diseases in Korea and Their Causal Pathogens

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Since 1993, a total of 50 problematic plant diseases unrecorded in Korea were surveyed in Gyeongnam province. Totally 34 new host plants to corresponding pathogens investigated in this study were 5 fruit trees, 9 vegetables, 12 ornamental plants, 3 industrial crops, and 5 medicinal plants. Among the newly recorded fruit tree diseases, fruit rot of pomegranate caused by *Coniella granati* and Rhizopus soft rot of peach caused by *Rhizopus nigricans* damaged severely showing 65.5% and 82.4% infection rate. Among the vegetable diseases, corynespora leaf spot of pepper caused by *Corynespora cassiicola* and the crown gall of pepper caused by *Agrobacterium tumefaciens*, powdery mildew of tomato caused by *Oidiopsis taurica* were the most severe revealing 47.6%, 84.7%, and 54.5% infection rate in heavily infected fields, respectively. In ornamental plants, collar rot of lily caused by *Sclerotium rolfsii*, gray mold of primula caused by *Botrytis cinerea*, soot leaf blight of *dendrobium* caused by *Pseudocercospora dendrobium*, sclerotinia rot of obedient plant caused by *Sclerotinia sclerotiorum* showed 32.7 to 64.8% disease incidence. On three industrial plants such as sword bean, broad bean, and cowpea, eight diseases were firstly found in this study. Among the diseases occurring on broad bean, rust caused by *Uromyces viciae-fabae* and red spot caused by *Botrytis fabae* were the major limiting factor for the cultivation of the plant showing over 64% infection rate in fields. In medicinal plants, anthracnose of safflower caused by *Collectotrichum acutatum* was considered the most severe disease on the plant and followed by collar rot caused by *Sclerotium rolfsii*.

Totally 23 plant pathogens caused 50 unrecorded plant diseases. They were identified into a bacterium, three *Zygomycetes*, five *Ascomycetes*, one *Basidiomycetes*, and thirteen *Deuteromycetes*. Among the pathogens belonging to *Deuteromycetes*, *Sclerotium rolfsii* that caused collar rot or southern blight showed a widest unrecorded host range. Nine crops namely, tomato, lily, safflower, water cress, pansy, wild aster, tatarian aster, broad bean, and doonggulle were firstly recorded new hosts of the fungus. The gray mold disease on persimmon, cucumis melo, primula, broad bean, and safflower were also newly reported as new hosts of *Botrytis cinerea*. Other fungi belonging to the phylum such as *Botrytis fabae*, *Cladosporium cucumerinum*, *Corynespora cassiicola*, *Corynespora melonis*, *Trichothecium roseum*, *Penicillium oxalicum*, *Oidiopsis taurica*, *Collectotrichum acutatum* and *Oidium* sp. *Alternaria tenuissima* were identified as the causal pathogens to their corresponding 18 host plants. In the phylum of *Ascomycetes*, *Sclerotinia sclerotiorum* was identified as the new causal pathogen of water cress, obedient plant and leonurus sibiricus. Other four fungi in the group such as *Gromerella cingulata*, *Coniella granati*, *Leveillula taurica* and *Sphaerotheca fuliginea* were also firstly reported causal pathogens on eight host plants. In the *Zygomycetes*, *Rhizopus stolonifer*, *R. nigricans*, and *Choanephora cucurbitarum* caused rots on various plant parts including tomato, citrus, petunia, cowpea, cotton rose, peach, and squash were also firstly reported in Korea. Crown gall of pepper caused by *Agrobacterium tumefaciens* and broad bean rust caused by *Uromyces*

viciae-fabae that belongs to *Basidiomycetes* were also firstly reported diseases in this study.

Among the diseases surveyed in this study, fruit rot of pomegranate, rhizopus soft rot of peach, corynespora leaf spot of pepper, powdery mildew of eggplant and tomato, collar rot or sclerotinia rot of water cress, soot blight of *dendrobium*, sclerotinia rot of obedient plant, collar rot, red spot, leaf spot, and rust of broad bean, anthracnose of safflower are considered limiting factors for the cultivation of their corresponding host plants. Accordingly, further ecological studies paved to develop effective control strategies are necessarily followed up.

Table 1. Newly emerged plant diseases and their corresponding causal pathogens firstly reported in Korea by the author from 1993 to 2003

	Host	Disease	Causal pathogen	Report year
Fruits tree	Persimmon	Gray mold	<i>Botrytis cinerea</i>	1999
	Citrus fruit	Rhizopus soft rot	<i>Rhizopus stolonifer</i>	2002
	Peach	Rhizopus soft rot	<i>Rhizopus nigricans</i>	2002
	Tea	Scab	<i>Cladosporium herbarum</i>	2001
	Pomegranate	Fruit rot	<i>Coniella granati</i>	2002
Vegetables	Pepper	Crown gall	<i>Agrobacterium tumefaciens</i>	1997
		Corynespora leaf spot	<i>Corynespora cassicola</i>	2001
	Eggplant	Powdery mildew	<i>Leveillula taurica</i>	1998
		Scab	<i>Cladosporium cucumerinum</i>	1999
	Strawberry	Scab	<i>Cladosporium herbarum</i>	2001
	Water cress	Collar rot	<i>Sclerotium rolfsii</i>	2001
		Sclerotinia rot	<i>Sclerotinia sclerotiorum</i>	2003
	Cucumis melo	Pink mold rot	<i>Trichothecium roseum</i>	1998
		Gray mold	<i>Botrytis cinerea</i>	1999
		Blue mold	<i>Penicillium oxalicum</i>	2002
	Cucumber	Corynespora leaf spot	<i>Corynespora melonis</i>	1993
	Tomato	Powdery mildew	<i>Oidiopsis taurica</i>	1995
		Rhizopus soft rot	<i>Rhizopus stolonifer</i>	2001
		Stem rot	<i>Sclerotium rolfsii</i>	2002
	Squash	Rhizopus soft rot	<i>Rhizopus stolonifer</i>	2000
Water melon	Blue mold	<i>Penicillium oxalicum</i>	1997	

	Host	Disease	Causal pathogen	Report year
Ornamental plants	Cosmos	Anthracnose	<i>Colletotrichum acutatum</i>	1999
	Lily	Collar rot	<i>Sclerotium rolfsii</i>	2000
	Statice	Powdery mildew	<i>Oidium</i> sp.	2001
	Petunia	Blossom blight	<i>Choanephora cucurbitarum</i>	2001
	Cotton rose	Flower rot	<i>Choanephora cucurbitarum</i>	2002
		Leaf spot	<i>Corynespora cassiicola</i>	2003
	Primula	Gray mold	<i>Botrytis cinerea</i>	2002
	Pansy	Stem rot	<i>Sclerotium rolfsii</i>	2002
	Phlox	Powdery mildew	<i>Oidium</i> sp.	2003
	Dendrobium	Soot leaf blight	<i>Pseudocercospora dendrobium</i>	2002
	Obedient plant	Sclerotinia rot	<i>Sclerotinia sclerotiorum</i>	2003
	Wild aster	Stem rot	<i>Sclerotium rolfsii</i>	2001
Tatarian aster	Stem rot	<i>Sclerotium rolfsii</i>	2002	
Industrial plants	Sword bean	Scab	<i>Cladosporium cucumerinum</i>	2000
	Broad bean	Powdery mildew	<i>Oidium</i> sp.	2001
		Collar rot	<i>Sclerotium rolfsii</i>	2001
		Red spot	<i>Botrytis fabae</i>	2002
		Leaf spot	<i>Alternaria tenuissima</i>	2002
		Rust	<i>Uromyces viciae-fabae</i>	2002
		Gray mold	<i>Botrytis cinerea</i>	2003
Cowpea	Pod rot	<i>Choanephora cucurbitarum</i>	2001	
Medicinal plants	Safflower	Anthracnose	<i>Colletotrichum acutatum</i>	1998
		Collar rot	<i>Sclerotium rolfsii</i>	1999
		Powdery mildew	<i>Sphaerotheca fuliginea</i>	2000
		Gray mold	<i>Botrytis cinerea</i>	2000
	Achyranthes japonica	Anthracnose	<i>Gromerella cingulata</i>	2002
	Leonurus sibiricus	Sclerotinia rot	<i>Sclerotinia sclerotiorum</i>	2002
	Doongulle	Collar rot	<i>Sclerotium rolfsii</i>	2000
Amarathus mangostanus	Anthracnose	<i>Gromerella cingulata</i>	2003	

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