Disease Notes

Fusarium Wilt of African Daisy (*Osteospermum* sp.) Caused by *Fusarium oxysporum* in Italy. A. Garibaldi, A. Minuto, and M. L. Gullino, DIVAPRA—Patologia Vegetale, Via Leonardo da Vinci 44, 10095 Grugliasco, Italy. Plant Dis. 88:309, 2004; published on-line as D-2004-0115-01N, 2004. Accepted for publication 20 December 2003.

During the fall of 2002, African daisy (*Osteospermum* sp.) plants showing symptoms of a wilt disease were observed in a commercial, nonheated glasshouse in Albenga in northern Italy. Wilted plants were first observed when outside temperatures were between 15 and 28°C. Symptoms were first observed on seedlings 40 days after they had been transplanted into pots. The vascular tissues of affected plants appeared brown. These plants were stunted and developed yellowed leaves with brown or black streaks in the vascular system. The vascular streaks in the yellow leaves extended from the crown and were continuous with a brown discoloration in the vascular system of the crown and upper taproot. *Fusarium oxysporum* was consistently and readily isolated from symptomatic vascular tissue onto a *Fusarium*-selective medium (1). Healthy, rooted, 40-day-old plants were inoculated by root-dip with a conidial suspension (1×10^7 CFU/ml) of three isolates of *F. oxysporum* obtained from infected plants and transplanted into pots filled with steam-sterilized soil. Noninoculated plants served as control treatments. Plants (10 per treatment) were grown in a glasshouse at an average temperature of 25°C (minimum of 12°C and maximum of 39°C). Wilt symptoms and vascular discoloration in the roots, crown, and veins developed within 20 days on each inoculated plant, while noninoculated plants remained healthy. *F. oxysporum* was consistently reisolated from infected plants. The pathogenicity test was conducted twice. To our knowledge, this is the first report of *F. oxysporum* on *Osteospermum* sp. in Italy or elsewhere in the world.

Reference: (1) H. Komada. Rev. Plant Prot. Res. 8:114, 1975.

First Report of the Root-Knot Nematode *Meloidogyne marylandi* on Turfgrasses in Israel. Y. Oka, Nematology Unit, Gilat Research Center, M. P. Negev 85280, Israel; G. Karssen, Plant Protection Service, P.O. Box 9102, 6700 HC, Wageningen, the Netherlands; and M. Mor, Department of Entomology and Nematology, Agricultural Research Organization, Bet-Dagan 50250, Israel. Plant Dis. 88:309, 2004; published on-line as D-2003-1223-01N, 2004. Accepted for publication 2 December 2003.

In a turfgrass nursery in Arava, Israel, a population of root-knot nematodes was isolated from poorly growing Zoysiagrass (*Zoysia japonica* Steud.) with symptoms of foliar chlorosis and roots with very small, smooth galls and protruding egg masses. The isolated population (genus *Meloidogyne*) included females and second-stage juveniles, whereas no males were observed. Measurements and morphological observations of 20 second-stage juveniles (body length = 423 ± 13 µm, dorsal gland orifice from stylet base = 2.6 ± 0.4 µm, tail length = 63 ± 3 µm, hyaline tail length = 12.4 ± 0.9 µm and hemizonid posterior to excretory pore) and 10 adult females (stylet length = 12.5 ± 0.7 µm, dorsal gland orifice from stylet base = 3.3 ± 0.5 µm, excretory pore to head end = 11.9 ± 1.3 µm and perineal patterns rounded to ovoid with coarse striae) conformed to the description of *Meloidogyne marylandi* Jepson and Golden (3). Additionally, the identification was confirmed when females and second-stage juveniles were compared with available paratype slides. The isozymes malate dehydrogenase (EC 1.1.1.37) and esterase (EC 3.1.1.1) of young, adult females were also different from those of other described root-knot nematode species, including *M. graminis*, a taxon closely related to *M. marylandi* (4). *M. marylandi* was discovered and described from Bermudagrass (*Cynodon dactylon* (L.) Pers) in Maryland in 1987. Outside the United States, it has only been isolated from *Zoysia matrella* in Japan (1,2,3). In host range tests with different turfgrasses, stolons with roots were inoculated after 1 week with 500 second-stage juveniles per plant and 6 weeks later, the produced egg-masses where counted. These tests showed that this root-knot nematode isolate reproduced on *Z. japonica* and *Pennisetum clandestinum*, while no egg masses were observed on the roots of *Dactyloctenium australe*, *Paspalum vaginatum*, and *Stenotaphrum secundatum.* Additionally, some cereals grown from seeds were tested. Wheat (*Triticum aestivum*), barley (*Hordeum vulgare*), and bristle oat (*Avena strigosa*) were infested with this nematode, while oat (*A. sativa*) was not. Although the origin of this root-knot nematode in Israel is unknown, it could have been distributed throughout the country with commercial turfgrass. To our knowledge, this is the first report of *M. marylandi* in Israel and outside the United States and Japan.

References: (1) M. Araki. Jpn. J. Nematol. 22:49, 1992. (2) A. M. Golden. J. Nematol. 21:453, 1989. (3) S. B. Jepson and A. M. Golden. Pages 263-265 in: Identification of Root-Knot Nematodes (*Meloidogyne* species). CAB International, Wallingford, U.K., 1987. (4) G. Karssen. The plant-parasitic nematode genus, *Meloidogyne* Göldi, 1892 (Tylenchida) in Europe. Brill, Leiden, the Netherlands, 2002.

First Report of Powdery Mildew on Potato Caused by *Golovinomyces cichoracearum* in California. M. K. Romberg, University of California, Davis; J. J. Nuñez, University of California Cooperative Extension, Bakersfield; J. J. Farrar, California State University, Fresno. Plant Dis. 88:309, 2004; published on-line as D-2004-0116-02N, 2004. Accepted for publication 11 December 2003.

In October 2003, potato plants in three fields (cv. Desiree, Satina, Midas, and Mondial) in Lancaster, California exhibited symptoms and signs of powdery mildew. Disease symptoms were most severe on cvs. Desiree and Santina. Disease expression was greater along sprinkler lines and in localized areas from which the disease spread to surrounding plants. Severely affected plants began collapsing just prior to water cutoff. Early symptoms comprise small dark areas on the adaxial surface of leaves, along the veins, and at the petioles. Dark lesions consisting of mycelia and conidiophores were also visible on the main stems of affected plants. As the disease progressed, leaves were covered by a gray powdery fungal mass, and older leaves became necrotic. Conidial chains arising from the hyaline, epiphytic mycelia consisted of two to eight conidia. The cylindric to doliform conidia measured 16.8 to 22.8 µm wide (mean = 19.2, standard error = 0.36, $N = 30$) × 28.8 to 45.6 µm long (mean = 32.4, standard error = 0.75, $N = 30$). No cleistothecia were observed. Identification of the causal agent as *Golovinomyces cichoracearum* (synonyms *G. orontii and Erysiphe cichoracearum*) based on morphology was confirmed by internal transcribed spacer (ITS)-polymerase chain reaction (PCR). Conidia were washed off the affected leaves, concentrated by filtration and centrifugation, and sonicated to release genomic DNA. PCR was performed on the sonicated conidia with primers ITS4 and ITS5 (2), and the resulting amplicon was purified and sequenced. BLAST analysis of the ITS sequence revealed a 99% homology to *E. cichoracearum* from an *Ambrosia* sp. (GenBank Accession No. AF011292). Pathogenicity was confirmed on potato seedlings cv. Red La Soda. Inoculations were performed twice on six plants (three pots) each time. A sterile brush was used to transfer conidia from the affected leaves to seedlings consisting of two to three fully expanded leaves. A plastic bag was placed around each pot containing two seedlings for 1 to 2 days and then removed. Noninoculated controls were stroked with a sterile brush, placed in a plastic bag for 1 to 2 days, and kept in the greenhouse on a separate bench. Two control plants were included for each inoculation. Plants were maintained in a greenhouse at approximately 25 to 28°C and 40 to 60% relative humidity. After 7 days, dark spots were visible on the leaves of all inoculated plants, and conidiophores with conidia identical to those of the isolate used as the inoculum source were apparent after 10 days. The controls showed no disease symptoms or signs. To our knowledge, this is the first report of powdery mildew caused by *G. cichoracearum* on potato in California. The first field report of the disease was from Washington in 1950 (1), with subsequent reports from Utah and Ohio.

References: (1) J. D. Menzies. Plant Dis. Rep. 34:140, 1950. (2) T. J. White et al. PCR Protocols. Academic Press, New York, 1990.

(*Disease Notes* continued on next page)

First Report of *Pythium irregulare* on Lentils in the United States. T. C. Paulitz, F. Dugan, and W. Chen, USDA-ARS, Washington State University, Pullman 99163-6430; and N. J. Grünwald, USDA-ARS, 24106 N. Bunn Rd., Prosser, WA 99350. Plant Dis. 88:310, 2004; published on-line as D-2004-0114-01N, 2004. Accepted for publication 15 December 2003.

In late June and early July 2002, stunted, chlorotic, and partially defoliated lentils (*Lens culinaris* Medik.) were observed throughout the lentil-growing areas of eastern Washington. These symptoms were investigated in two fields near Garfield, WA and one field near Genesee, ID. Cv. Mason was more affected than cv. Brewer. Roots were dry and brittle with black discoloration in some cases. Isolates of *Fusarium oxysporum* and *F. solani* were obtained from washed roots plated on water agar, but they were nonpathogenic in greenhouse testing in pasteurized field soil and peat-based growing mixes. On 21 April 2003, volunteer lentils growing in the same fields showed symptoms of root rot, and *Pythium* oospores were observed in the roots. *Pythium* spp. were isolated by using a selective medium (2). Oospores were aplerotic, intercalary, 12.6 to 21 µm long × 11.2 to 18.2 µm wide, mostly smooth, and often formed in chains. Isolates resembled *P. paroecandrum* Drechs. and *P. irregulare* Buisman on the basis of morphological characters (3), but DNA sequences of the internal transcribed spacer region were closer to *P. irregulare* on the basis of a comparison with a worldwide database of *Pythium* sequences (C. A. Lévesque, *personal communication*). Isolates were deposited with the USDA-ARS Western Regional Plant Introduction Station, Pullman, WA. Four hyphal-tip isolates were tested in the greenhouse with inoculum grown in autoclaved sandy loam amended with 1% ground rolled oats. Experiments were performed twice in Thatuna silt loam, first in pasteurized and then in nonpasteurized soil. Inoculum was added to the soil at 500 CFU/g, and seeds were planted on the same day. Each isolate was tested on cvs. Brewer and Mason, with five replicates per treatment. Plants were grown in 4- × 20.5-cm plastic tubes (two plants per tube) for 1 month at 16 to 22°C and supplemented with 14 h of light per day. *P. irregulare* was reisolated from infected roots in both experiments. Damping-off, stunting, chlorosis, and root rot were observed in the *Pythium*-inoculated treatments, which corresponded to symptoms observed in the field in 2002. In pasteurized soil, only one isolate reduced the whole, dry, plant weight of Brewer, but the other three isolates reduced the dry weight of Mason. All isolates reduced the root dry weight of Mason in natural soil, but only two isolates reduced the root dry weight of Brewer. To our knowledge, *Pythium* spp., but not *P. irregulare*, have been reported previously from lentils (1). *P. irregulare* also causes root rot on winter wheat, which is rotated with lentils, and this pathogen likely causes yield reduction in both crops.

References: (1) D. F. Farr et al. Fungi on Plants and Plant Products in the United States. The American Phytopathological Society, St. Paul, MN, 1989. (2) S. M. Mircetich and J. M. Kraft. Mycopathol. Mycol. Appl. 50:151, 1973. (3) A. J. van der Plaats-Niterink. Stud. Mycol. 21:1, 1981.

First Report of Southern Blight Caused by *Sclerotium rolfsii* on Laurustinus. G. Polizzi, A. Vitale, and G. Parlavecchio, Dipartimento di Scienze e Tecnologie Fitosanitarie, University of Catania, Via S. Sofia 100, 95123 Catania, Italy. Plant Dis. 88:310, 2004; published on-line as D-2003-1219-01N, 2004. Accepted for publication 1 December 2003.

Laurustinus (*Viburnum tinus* L.), native to the Mediterranean Region, is an evergreen shrub commonly used as a specimen shrub or small tree or used in border plantings. During August 2003, a blight occurred on 2-year-old-plants of laurustinus growing in pots in a nursery in eastern Sicily (Italy). Disease incidence ranged from 2 to 5% across the field. Symptoms included 3 to 4 cm long lesions and the development of white mycelial strands and brown, 1.0 to 1.8 mm, nearly spherical sclerotia on the crown of plants at the soil line that are typical of *Sclerotium rolfsii* Sacc. The foliage of infected plants wilted, followed by a sudden collapse of the plant. The fungus was consistently isolated on acidified potato dextrose agar (PDA) (pH 4.5) by plating symptomatic tissues that were surface disinfested (1.2% NaOCl) for 1 min. and rinsed in sterile water. Pathogenicity tests were performed by sprinkling 50 sclerotia, obtained from infected oat kernels (2), on the soil surface around the collar of each of 10 healthy, potted 1-year-old plants of laurustinus. Five of the plants were previously wounded on the crown 1.5 cm above or below the soil line with a sterile needle. Five noninoculated plants served as controls. All plants were maintained at 25 ± 2°C and enclosed for 72 hr in polyethylene bags (90 to 95% relative humidity). Blight symptoms similar to those seen in nursery were observed on inoculated plants 20 to 25 days after inoculation, while no symptoms developed on control plants. Koch's postulates were fulfilled by reisolation of the fungus on acidified PDA from all infected laurustinus plants. *S. rolfsii* was previously recorded on Prague viburnum (*Viburnum* × *pragense* L.) as the causal agent of southern blight (1). To our knowledge, this is the first report of southern blight caused by *S. rolfsii* on laurustinus.

References: (1) A. Hagan. Southern blight on flowers, shrubs, and trees. On-line publication ANR-1157. Alabama A & M, and Auburn University (www.aces.edu/dept/extcomm/publications/html). (2) R. Rodriguez-Kabana et al. Plant Dis. Rep. 59:5, 1975.

An Outbreak of Bacterial Stem Rot of *Dieffenbachia amoena* Caused by *Erwinia carotovora* subsp. *carotovora* in the Eastern Mediterranean Region of Turkey. R. Cetinkaya-Yildiz, M. Mirik, Y. Aysan, and M. Kusek, Department of Plant Protection, Faculty of Agriculture, Cukurova University, 01330 Adana, Turkey; and F. Sahin, Department of Plant Protection, Faculty of Agriculture, Ataturk University, 25240 Erzurum, Turkey. Plant Dis. 88:310, 2004; published on-line as D-2004-0119-02N, 2004. Accepted for publication 15 December 2003.

Severe outbreaks of bacterial stem rot disease occurred on dieffenbachia plants (*Dieffenbachia amoena* cv. Tropic Snow) during the autumn and spring seasons of 2002 and 2003 in two commercial glasshouses (3.5 ha) near Adana and Mersin in the Eastern Mediterranean Region of Turkey. Characteristic symptoms of the disease were wilting of the lower leaves, darkening and water soaking of the leaves and stem at or below the soil level, and browning in the vessel and pith of the diseased plants. Eventually, the stem and leaves completely rotted, and the plants collapsed. Nearly 30 and 40% (2002 and 2003, respectively) of the 20,000 potted plants in the glasshouses were destroyed because of the disease. Cuttings often developed a typical soft rot during propagation. Disease incidence was estimated at approximately 50% on propagating material during 2003. Isolations were made from rotted stems, leaves, and discolored vessels of the dieffenbachia plants on King's medium B. Bacteria consistently isolated from the diseased tissues formed white-to-cream colonies on the medium. Bacteria from purified colonies were gram, oxidase, and arginine dyhidrolase negative, catalase positive, and facultative anaerobic. Ten representative strains all fermented glucose and reduced nitrates to nitrites. The strains caused soft rot of potato slices within 24 h at 25°C. All strains were resistant to erythromycin in an antibiotic disk (15 µg) assay. Negative results were obtained from utilization of α-methyl glycoside, reducing substance from sucrose, and indole production from tryptophane and phosphathase activity. Positive results were obtained from pectate, aesculin, and gelatine liquefaction for all strains. Acid was produced from glucose, sucrose, mannitol, mannose, lactose, raffinose, melibiose, trehalose, and L(+)-arabinose but not D-arabinose, sorbitol, inulin, and maltose. Pathogenicity was confirmed by needle-stab inoculation at the stem on three plants each of dieffenbachia and tomato plants (5-week-old cv. H-2274). Sterile distilled water was used as a negative control. All plants were covered with polyethylene bags for 48 h at 25°C. Within 72 h after inoculation, water-soaking and soft-rot symptoms were observed on dieffenbachia and tomato plants. All of the bacterial strains isolated in the present study were identified as *Erwinia carotovora* subsp. *carotovora* (Jones) based on fatty acid methyl ester analysis with similarity indices ranging from 80 to 94%. Furthermore, Biolog GN (Department of Plant Protection, Faculty of Agriculture, Ataturk University, Erzurum, Turkey) profiles identified them as the same pathovar with similarity values of 67 to 72%. All of the test results were similar to those of reference strain GSPB 435 (Gottinger Sammlung phytopathogener Bakterien, Georg-August University, Gottingen, Germany) of *E. carotovora* subsp. *carotovora* used in this study. To our knowledge, this is the first report of the occurrence and outbreak of a bacterial rot disease on dieffenbachia grown in the Eastern Mediterranean Region of Turkey. Contaminated cuttings may be the primary source of inoculum within and between glasshouses.

First Report of White Pine Blister Rust on Rocky Mountain Bristlecone Pine. J. T. Blodgett, USDA-Forest Service, Forest Health Management, 1730 Samco Road, Rapid City, SD 57702; and K. F. Sullivan, P.O. Box 25127, Lakewood, CO 80225. Plant Dis. 88:311, 2004; published on-line as D-2004-0107-02N, 2004. Accepted for publication 9 December 2003.

White pine blister rust caused by *Cronartium ribicola* was introduced into North America in the early 20th century and is spreading throughout the range of five-needle pines. In northern Colorado, this pathogen was first observed in 1998 on limber pine (*Pinus flexilis*) (1). It has not been reported on Rocky Mountain or Great Basin bristlecone pine (*Pinus aristata* and *P. longaeva*, respectively) in nature. However, Rocky Mountain bristlecone pine is susceptible to the disease when artificially inoculated (2). In October 2003, a Rocky Mountain bristlecone pine was found infected with *C. ribicola* in the Great Sand Dunes National Monument, Alamosa County, Colorado. Seven branch cankers were observed on the tree. Cankers ranged in length from 15 to 41 cm and were estimated to be approximately 5 to 7 years old. Distinct *C. ribicola* branch symptoms were observed, including flagging, spindle-shaped swellings, and 6 mm long aecial scars. A branch was deposited at the Colorado State Herbarium. Microscopic examination of spores within remnant aecial blisters revealed aeciospores characteristic of *C. ribicola* (yellow-orange, ellipsoid, verrucose, and 19 × 25 µm). Cankers were only observed on one bristlecone pine. However, most limber pines in the area were infected with *C. ribicola*, including a limber pine less than 1 m from the infected bristlecone pine. To our knowledge, this is the first report that shows Rocky Mountain bristlecone pine can become infected naturally, and the pathogen is further south in Colorado on limber pine than previously reported. These observations suggest the need for a more complete investigation of this disease on bristlecone pines.

References: (1) D. W. Johnson and W. R. Jacobi. Plant Dis. 84:595, 2000. (2) B. R. Stephan, Allg. Forst Z. 28:695, 1985.

First Report of the Occurrence of *Tomato chlorosis virus* and *Tomato infectious chlorosis virus* in Taiwan. W. S. Tsai, S. L. Shih, S. K. Green, and P. Hanson, The Asian Vegetable Research and Development Center (AVRDC), Shanhua, Tainan 741, Taiwan, Republic of China; and H. Y. Liu, USDA-ARS, Salinas, California. Plant Dis. 88:311, 2004; published on-line as D-2004-0108-01N, 2004. Accepted for publication 8 December 2003.

Pronounced yellowing symptoms on the lower leaves of tomato plants, similar to those caused by nitrogen deficiency, were observed in the spring of 1998 in The Asian Vegetable Research and Development Center and in farmers' fields in southern Taiwan. However, the brittleness of the discolored leaves, occasional upward leaf rolling, and abundance of whiteflies on these plants suggested the involvement of *Tomato chlorosis virus* (ToCV) and *Tomato infectious chlorosis virus* (TICV) that belong to the group of whitefly-transmitted, phloem-limited criniviruses (family *Closteroviridae*). Leaves of symptomatic and healthy plants were collected, and total nucleic acids were extracted from 0.2 g of leaf tissue (1). The total nucleic acids were precipitated by ethanol and dissolved in 160 µl of sterile water. Eight microliters of total nucleic acids were observed on positively charged nylon membranes (Roche Diagnostic GmbH, Roch Applied Science, Germany). Two digoxigenin-labeled riboprobes, transcribed from pTIC8-44 (complementary to the 3′-end region of TICV RNA 1) and pToC 78 (corresponding to the coat protein region of ToCV RNA 2), were used in hybridization tests to detect TICV and ToCV, respectively (2). Six of seventeen symptomatic tomato plant samples were positive with the ToCV probe, whereas none of the 13 samples reacted with the TICV probe. Similar symptoms as described above for tomato were observed on zinnia plants in the same locations. Five of eight zinnia samples gave a positive reaction with the ToCV probe. One of the ToCV positive samples also gave a positive reaction with the TICV probe. Electron microscopic examination from leaf-dip preparations of ToCV-positive leaf tissues, stained in 1% uranyl acetate, showed the presence of flexuous filamentous particles approximately 800 to 850 nm long. To our knowledge, this is the first evidence of the presence of ToCV and TICV in zinnia and ToCV in tomato in Taiwan.

References: (1) A. Hadidi et al. J. Virol. Methods 30:261, 1990. (2) G. C. Wisler et al. Phytopathology 88:402, 1998.

Fusarium Wilt of Gerbera in Soil and Soilless Crops in Italy. A. Garibaldi, A. Minuto, D. Bertetti, and M. L. Gullino, Centre of Competence for the Innovation in the Agro-Environmental Sector (AGRINNOVA), Via Leonardo da Vinci 44, 10095 Grugliasco, Italy. Plant Dis. 88:311, 2004; published on-line as D-2004-0115-02N, 2004. Accepted for publication 16 December 2003.

In 2002, gerbera (*Gerbera jamesonii* cv. Kaiki) plants that were grown for cut flowers in a soilless cultivation system (rockwool substrate) at Albenga (Savona) in northern Italy were observed exhibiting symptoms of a wilt disease. During the summer of 2002, in a commercial gerbera farm in the province of Imperia (northern Italy), a similar wilt was also observed on cvs. Red Bull, Anedin, and Gud finger that were grown in soil. In both cases, the planting material originated from the Netherlands. During 2003, wilted plants (cvs. Red Bull, Basic, and Cirill) were repeatedly observed in other commercial greenhouses located in the same area. Affected plants were stunted and developed yellowed leaves with initially brown and eventually black streaks in the vascular system. The vascular streaks in the yellow leaves were continuous with a brown discoloration in the vascular system of the crown and upper taproot. In some cases, the leaves of affected plants turned red. From these plants, *Fusarium* spp. were consistently and readily isolated from symptomatic vascular tissue onto a *Fusarium*-selective medium (2). Colonies were identified as *F. oxysporum* after subculturing on potato dextrose agar. Healthy rooted 30-day old plants (cv. Dino) were inoculated by dipping roots into a conidial suspension (5×10^7 conidia per ml) in one of six test isolates of *F. oxysporum.* Plants were transplanted (1 plant per pot) into pots (3.5 l vol) containing rockwool-based substrate. Noninoculated plants served as control treatments. Plants (21 per treatment) were grown in a glasshouse with an average day temperature of 31°C and night temperature of 25°C (minimum of 20°C and maximum of 42°C). Wilt symptoms and vascular discoloration in the roots, crown, and veins developed within 30 days on each inoculated plant, while noninoculated plants remained healthy. *F. oxysporum* was consistently reisolated from infected plants. The pathogenicity test was conducted twice. To our knowledge, this is the first report of the presence of *F. oxysporum* on gerbera in Italy. A wilt of gerbera was described in the Netherlands in 1952 (1) but its presence was not confirmed in further observations (3).

Reference: (1) J. Arx and J. A. von Tijdschr. PlZiekt. 58:5, 1952 (2) H. Komada. Rev. Plant Prot. Res. 8:114, 1975. (3) G. Scholten. Neth. J. Plant Pathol. 76:212, 1970.

(*Disease Notes* continued on next page)

First Report of Downy Mildew on Basil (*Ocimum basilicum*) in Italy. A. Garibaldi, A. Minuto, G. Minuto, and M. L. Gullino, DIVAPRA–Patologia vegetale, Via Leonardo da Vinci 44, 10095 Grugliasco, Italy. Plant Dis. 88:312, 2004; published on-line as D-2003-1223-02N, 2004. Accepted for publication 4 December 2003.

Sweet basil (*Ocimum basilicum*) is an economically important herb in several Mediterranean countries. Approximately 80 ha are grown annually in Italy for fresh and processed consumption. In 2003, a damaging foliar disease was observed in several greenhouses located in the Liguria Region of northern Italy. More that 50% of the plants were affected. Leaves of infected plants were initially slightly chlorotic, especially near the central vein. Within 2 to 3 days, a characteristic gray, furry growth was evident on the lower surface of infected leaves. These symptoms sometimes occurred on the top sides of leaves. Although the distribution of the disease was generally uniform, symptoms appeared first in a patchy pattern in the central part of the greenhouses where air temperature and relative humidity were highest. Where air circulation was apparently poor, bottom leaves were severely affected by the disease. Microscopic observations revealed conidiophores branching two to seven times. Conidiophores with a length of 250 to 500 µm (average 350 µm) ended with sterigmata bearing single conidia. Conidia measured 15 to 25 × 20 to 35 µm (average 22 × 28 µm) and were elliptical and grayish in mass. The pathogen was identified as a *Peronospora* sp. based on its morphological characteristics (3). Pathogenicity was confirmed by inoculating leaves of 40-day-old healthy plants with a conidial suspension (1×10^5 conidia per ml). Three containers containing 150 plants each of *O. basilicum* cv. Genovese gigante were used as replicates. Noninoculated plants served as controls. Inoculated and noninoculated plants were maintained in a growth chamber at 20°C (12 h of light per day) and 90 to 95% relative humidity. The pathogenicity test was carried out twice. After 6 days, typical symptoms of downy mildew developed on the inoculated plants and a *Peronospora* sp. was observed on the leaves. Noninoculated plants did not show symptoms. To our knowledge, this is the first report of a *Peronospora* sp. on basil in Italy. *Peronospora* sp. and *P. lamii* were previously reported on sweet basil in Uganda (1,2).

References: (1) C. G. Hansford. Rev. Appl. Mycol. 12:421, 1933. (2) C. G. Hansford. Rev. Appl. Mycol. 17:345, 1938. (3) D. M. Spencer. The Downy Mildews. Academic Press, N.Y., 1978.

First Report of Stem and Leaf Blight Caused by *Sclerotinia minor* on *Geranium carolinianum* in North Carolina. J. E. Hollowell and B. B. Shew, Department of Plant Pathology, North Carolina State University, Raleigh 27695-7903. Plant Dis. 88:312, 2004; published on-line as D-2003-1217-01N, 2004. Accepted for publication 1 December 2003.

The soilborne fungus *Sclerotinia minor* Jagger is a major pathogen of peanut (*Arachis hypogaea* L.) in North Carolina and overwinters in soil, on crop debris, or on winter annual weed species (1). Bleached stems and small, black sclerotia are typically seen on peanut plants infected by *S. minor*. Carolina geranium (*Geranium carolinianum* L.) is one of several winter annual weed species found during winter fallow in peanut production areas of northeastern North Carolina. During a March 2002 survey of previously harvested peanut fields, plants of Carolina geranium were observed with typical signs and symptoms of infection caused by *S. minor*. Symptomatic plants with bleached stems and signs of small, black sclerotia were collected in the field and returned to the laboratory. Pathogen isolation and fungal identification were performed from the symptomatic tissues by placing 1- to 2-cm sections of stems on potato dextrose agar after rinsing with tap water and towel drying. Pure cultures of *S. minor* were obtained and observed to have white, fluffy mycelium and small, black irregular-shaped sclerotia (<2 mm) produced abundantly and scattered over the culture surface. Pathogenicity was tested by inoculating stems of three symptom-free Carolina geranium plants with 2-day-old fungal mycelium from pure isolation. Mycelial agar plugs, 4 mm in diameter, were held in place with self-sticking bandaging gauze. Plants were misted, enclosed in plastic bags, and incubated at ambient temperature (24°C) on the laboratory counter top. Bleached water-soaked lesions developed on the stems, and leaves became chlorotic after 8 days. Following 8 days of incubation, *S. minor* was reisolated from all inoculated plants. Three noninoculated plants remained healthy over the incubation period. The performance of Koch's postulates confirmed that Carolina geranium is a host of *S. minor*. To our knowledge, this is the first report of *S. minor* on *G. carolinianum*. These results indicate that *G. carolinianum* is a potential overwintering host for *S. minor* in peanut fields. Infected weed hosts allow reproduction of the fungus in the winter, potentially resulting in more disease on peanut planted in the spring.

Reference: (1) J. E. Hollowell et al. Plant Dis. 87:197, 2003.

First Report of Powdery Mildew Caused by *Erysiphe cichoracearum* on Creeping Thistle (*Cirsium arvense*) in North America. G. Newcombe and C. Nischwitz, Department of Forest Resources, University of Idaho, Moscow 83844. Plant Dis. 88:312, 2004; published on-line as D-2004-0107-01N, 2004. Accepted for publication 9 December 2003.

Creeping or Canada thistle (*Cirsium arvense* (L.) Scop.) is a perennial weed of Eurasian origin that arrived in North America as early as the 1700s (3). Spreading by seeds and rhizomes, it is now widely distributed in Canada, Alaska, and 40 other states. It is apparently absent from Texas, Oklahoma, Louisiana, Mississippi, Alabama, Georgia, Florida, and South Carolina (1). Powdery mildew is common on *C. arvense* in Europe, but it has never been observed in North America (4). In Europe and Asia, powdery mildew of *C. arvense* is caused by any one of the following fungi: *Leveillula taurica*, two species of *Sphaerotheca*, and varieties of *Erysiphe cichoracearum* and *E. mayorii*. Specimens of *C. arvense* infected with powdery mildew (deposited in the U.S. National Fungus Collections as BPI 843471) were collected in the fall of 2003 near Moscow, ID and in two areas in Oregon (the canyon of the Grande Ronde River and near the base of the Wallowa Mountains). Mycelium and cleistothecia were observed on stems and upper and lower surfaces of leaves. The mean diameter of the cleistothecia was 122 (±11.6) µm. Basally inserted, mycelioid appendages were hyaline or brown and varied considerably in length, but most were in the range of 80 to 120 µm. Asci averaged 58 (±5.5) µm × 35 (±4.1) µm in length and width, respectively. Each ascus bore two ascospores averaging 23 (±1.4) µm × 14 (±1.7) µm. Conidia averaged 30 (±3.0) µm × 14 (±0.8) µm. The specimens fit the description of *E. cichoracearum* DC. (2). Because the length/breadth ratio of conidia is greater than 2, the specimens could be further diagnosed as *E. cichoracearum* var. *cichoracearum* (2). Also noteworthy was the presence of the hyperparasitic *Ampelomyces quisqualis* Ces. ex Schlechtend. *E. cichoracearum* is thought to be a cosmopolitan powdery mildew of broad host range, but this concept is difficult to reconcile with the absence of mildew on North American populations of *C. arvense* for more than 200 years.

References: (1) Anonymous. USDA Natural Resources Conservation Service Plants Profile for *Cirsium arvense*. On-line publication, 2003. (2) U. Braun. A monograph of the *Erysiphales* (powdery mildews), J. Cramer, Berlin-Stuttgart, 1987. (3) G. Cox. Alien Species in North America and Hawaii, Island Press, Washington, D.C., 1999. (4) D. F. Farr et al. Fungal Databases, Systematic Botany and Mycology Laboratory, ARS, USDA. On-line publication, 2003.