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93/134

NEW PEST...Flame chlorosis - a new disease of spring cereals

It was reported at the 6th International Congress of Plant Pathology in Montreal that a new and unusual disease affects spring cereals in the province of Manitoba, CA. Flame chlorosis, as the disease was named, is a soil-transmitted disease which is possibly vectored by *Pythium* sp. and was first detected in 1985. Since its first detection the disease has spread to several previously uninfected regions in Manitoba. Its symptoms of variegated chlorosis appear as early as the one-leaf stage. Mitochondria and chloroplasts of affected cells are hypertrophied and contain extensive proliferation of fibril-containing vesicles that form within the organellar envelope. Flame chlorosis-specific double stranded RNAs (dsRNA) occur in diseased tissues, but virion particles were never observed. Sequence analysis showed that the flame chlorosis RNA is not related to nucleic acid sequences of currently known plant virus groups and viroids.

Infected plants do not develop viable heads and yield losses can be in heavily infected fields as high as the percentage of infected plants.

Source: Haber, S.; Chong, J. (1993) Flame chlorosis: A novel, soil-transmitted, viruslike disease of spring cereals.

Presentation at the 6th International Congress of Plant Pathology, Montreal, CA, 1993-07/08-27/06.

93/135

NEW PEST/ZA...*Coniothyrium* stem canker of Eucalyptus in South Africa

The occurrence of a new disease of *Eucalyptus grandis* in South Africa had been reported in Reporting Service 516/03 (1991-10). Further details on this pest have now been presented at the 6th International Congress of Plant Pathology in Montreal. A previously undescribed *Coniothyrium* sp. is causing stem canker which is characterized by small, circular, necrotic lesions on the young green bark that ultimately result in considerable stem malformation. Atypical, large, irregular lesions can also develop on highly susceptible cultivars. Pathogenicity tests have shown the pathogenicity of the fungus as well as the varying susceptibility of *Eucalyptus* species, clones and hybrids. The authors concluded that *Coniothyrium* stem canker has become within three years one of the most serious and debilitating diseases of *Eucalyptus* in South Africa. They assume that the pathogen has evolved in the country and that its distribution is restricted to South Africa. If this is so, the authors conclude, *Coniothyrium* stem canker could pose a serious threat to both native and exotic *Eucalyptus* spp. elsewhere in the world.

Source: Kemp, G.H.J.; Wingfield, M.J. (1993) *Coniothyrium* stem canker disease of *Eucalyptus* in South Africa.

Presentation at the 6th International Congress of Plant Pathology, Montreal, CA, 1993-07/08-27/06.



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CN...Narcissus viruses occurring in China

In recent years the substantial narcissus production in China suffered yield and quality losses due to virus infections of the plants. To investigate the causal agents of the virus infections and to determine the range of infection a survey was carried out in the most affected province of Fujian. As reported at the 6th International Congress of Plant Pathology in Montreal, 7 viruses were found in field collected narcissus plants. They were narcissus latent carlavirus, narcissus mosaic potexvirus, narcissus yellow stripe potyvirus, cucumber mosaic cucumovirus, potato Y potyvirus, tobacco mosaic tobamovirus and tobacco rattle tobavirus. Several plants showed multiple infections by several viruses and the incidence of virus infection in the field reached up to 100%.

Source: Xie, L.H.; Lin, Q.Y.; Xie, L.Y.; Zheng, X.Y.; Wu, Z.J. (1993) The pathogen identification of narcissus virus diseases in China.
Presentation at the 6th International Congress of Plant Pathology, Montreal, CA, 1993-07/08-27/06.



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CKCCXX...Coconut cadang-cadang viroid and coconut
cadang-cadang viroid-like organisms in the Pacific region

Coconut cadang-cadang viroid (potential EPPO A1 quarantine pest) (CCCVd) was first detected in the Philippines. A survey sponsored by the Australian Center for International Agricultural Research (ACIAR) was carried out to determine the occurrence of the disease in the South Pacific region. As reported at the 6th International Congress of Plant Pathology in Montreal, 2500 samples have been collected within the region including species of coconut, oil and other palms, Pandanaceae and herbaceous monocotyledons such as Zingiberaceae, Marantaceae and Commelinaceae. The samples were investigated for the presence of CCCVd by electroblot hybridization using a full length cRNA probe homologous to CCCVd.

A range of small nucleic acids with secondary molecular structure and nucleotide sequences similar to CCCVd have been detected in a high percentage of members of numerous species from all locations surveyed. The oil palms with CCCVd-related molecules showed severe orange spotting and stunting, symptoms resembling those of CCCVd infection in the Philippines and that of "genetic" orange spotting (GOS). The authors believe that the GOS is caused by viroid allied to CCCVd and which is infectious to coconut. Coconut palms containing CCCVd-related sequences outside the central Philippines do not show the typical cadang-cadang syndrome, but sometimes seem stunted, low-bearing or chlorotic. The authors consider that these isolates represent variants of the CCCVd. CCCVd-like sequences with a strong homology to CCCVd were also found in herbaceous monocotyledons infecting over 60% of the species sampled, but appearing generally symptomless. Malaysia and Sri Lanka had the highest rank of viroid infection. Pathogenicity tests for these isolates, however, have not been carried out yet. The authors concluded that viroids related by nucleotide sequence homology to CCCVd occur widely in palms and other monocotyledons outside the Philippines.

Source: Hanold, D.; Randles, J.W. (1993) A new viroid family infecting tropical monocotyledons.
Presentation at the 6th International Congress of Plant Pathology, Montreal, CA, 1993-07/08-27/06.



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93/138 **TMSWXX/EC...Update on the occurrence of tomato spotted wilt tospovirus in the EC (PT)**

As reported in Reporting Service 520/04 (1992-02) tomato spotted wilt tospovirus (potential EPPO A2 quarantine pest) has been found on glasshouse plants in two locations in the south of Portugal. A report presented at the 6th International Congress of Plant Pathology in Montreal updated the situation of TSWV in Portugal claiming the increased importance of this virus in horticultural crops. During the season 1991-92, 22 plant species belonging to 12 families (ornamentals, vegetables, weeds) were found to be infected. The virus was more frequently found in lettuce, pepper and tomato crops and caused serious damage in hydrangea cultivation.

Source: Louro, D. (1993) Tomato spotted wilt virus in ornamental and vegetable crops in Portugal.
Presentation at the 6th International Congress of Plant Pathology, Montreal, CA, 1993-07/08-27/06.

93/139 **TMSWXX/WMSWXX...Watermelon spotted wilt - a new tospovirus**

In Reporting Service 529/06 (1992-11) the detection of a tomato spotted wilt tospovirus (potential EPPO A2 quarantine pest)-like organism had been reported on watermelon in Taiwan and named as TSWV-W. Recent research results, presented at the 6th International Congress of Plant Pathology in Montreal, however, strongly indicate that the virus is distinct from tomato spotted wilt tospovirus. Nucleotide sequencing of the nucleocapsid (N) protein of the new virus and its comparison with the sequences from TSWV-L and I serotypes showed only slight similarities. The low similarity of the N gene with those of the L- and I-serotypes at both nucleotide and aminoacid levels coupled with the negative hybridization relationship with them strongly indicated that TSWV-W, renamed as watermelon spotted wilt tospovirus is a distinct member of the Tospovirus genus.

Source: Yeh, S.-D.; Chang, T.-F. (1993) Nucleotide sequence of the N gene of watermelon spotted wilt virus, a distinct tospovirus.
Presentation at the 6th International Congress of Plant Pathology, Montreal, CA, 1993-07/08-27/06.



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93/140 **ERWIAM...Symptomless survival of *Erwinia amylovora* on foliage of host plants**

In North Ireland (UK), experiments were carried out to study the symptomless survival of *Erwinia amylovora* (EPPO A2 quarantine pest) on foliar surfaces of host plants. As reported at the 6th International Congress of Plant Pathology in Montreal, the pathogen could be isolated from healthy leaves six months after the bacteria were inoculated onto the foliage and maintained at 90% relative humidity and 19°-21° C in a growth chamber. When *E. amylovora* was coinoculated on the leaves with *Pseudomonas syringae* or *E. herbicola*, two common foliar epiphytes, the *E. amylovora* persisted and were reduced only slightly. If the leaves, however, developed severe fireblight symptoms the pathogen could not be isolated after 2-3 months. The authors concluded that epiphytic populations of *E. amylovora* can increase during transportation and that the pathogen can spread on symptomless plants.

Source: Blakeman, J.P.; McCracken, A.R. (1993) Symptomless survival of *Erwinia amylovora* (fireblight) on foliar surfaces of host plants.
Presentation at the 6th International Congress of Plant Pathology, Montreal, CA, 1993-07/08-27/06.



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XANTCI...New atypical strains of *Xanthomonas campestris* pv. *citri*

It was reported at the 6th International Congress of Plant Pathology in Montreal that new atypical strains of *Xanthomonas campestris* pv. *citri* (EPPO A1 quarantine pest) were isolated from Mexican lime (*Citrus aurantifolia*) in Saudi Arabia, Oman and India. When inoculated on Mexican lime leaves, the pathogen produced symptoms similar to the pathotype A strains of *X.c.* pv. *citri*. If, however, inoculated on grapefruit, Eureka lemon, sour orange and *Poncirus trifoliata* the produced symptoms were different from those produced by the A strains. The atypical strains could be easily separated from the typical A strains by their serological properties and less readily by their metabolic fingerprinting.

Source: Verniere, C.; Pruvost, O.; Civerolo, E.; Hartung, J.; Maestri, P. (1993) Characterization of new atypical strains of *Xanthomonas campestris* pv. *citri*. Presentation at the 6th International Congress of Plant Pathology, Montreal, CA, 1993-07/08-27/06.

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XANTCI...EPPO Distribution list for *Xanthomonas campestris* pv. *citri*

Due to the reports to EPPO of *Xanthomonas campestris* pv. *citri* (EPPO A1 quarantine pest) in Oman, Palau and Taiwan the distribution of this pathogen is as follows. Note also that earlier unconfirmed reports from Guadeloupe and Martinique are erroneous and have been deleted.

EPPO Distribution List: *Xanthomonas campestris* pv. *citri*

EPPO region: Absent

Asia: *X. campestris* pv. *citri* is indigenous to and widespread as A strains throughout Asia, occurring in Afghanistan, Bangladesh, China (Fujian, Jiangxi, Sichuan, Eastern China), Hong Kong, India, Indonesia, Japan (including Okinawa), Kampuchea, Korea Democratic People's Republic, Korea Republic, Lao, Malaysia, Maldives, Myanmar, Nepal, Oman, Pakistan, Philippines, Saudi Arabia, Singapore, Sri Lanka, Taiwan, Thailand, United Arab Emirates, Vietnam, Yemen.

Africa: A strains in Comoros, Congo, Côte d'Ivoire, Gabon, Madagascar, Mauritius, Mozambique (reported to be eradicated), Réunion, Seychelles, Zaire.

North America : Mexico (D strain only; declared no longer to occur - EPPO Reporting Service 512/13), USA (introduced into Florida in 1912 and spread to Alabama, Georgia, Louisiana, South Carolina and Texas ; eradicated in Florida by 1933 and from all USA by 1947 ; the A strain reappeared in Florida in 1986 and an eradication programme is currently being conducted to eliminate the disease and preclude establishment and dissemination of the pathogen).

Central America and Caribbean: Reports of the disease in Belize, Dominica, Haiti, St. Lucia, Trinidad and Tobago are unconfirmed and without details.

South America: Argentina (A strain along the coast, B strain only in small isolated foci on lemon in the South of Entre Rios), Brazil (A and C strains, Sao Paulo - in the region of Presidente Prudente ; Paraná - north-east, north and west central ; Mato grosso del Sur - east, southeast and south ; Santa Catarina), Paraguay (A, B and C strains, east and west (Chaco central)), Uruguay (A strain under eradication, Salto - on north bank of River Uruguay ; Paysandu - north ; B strain eradicated since 1985).

Oceania: Christmas Island, Cocos Islands, Fiji, Guam, Northern Mariana Islands, Micronesia, Palau, Papua New Guinea. The disease was eradicated from commercial citrus areas in New Zealand and in Australia; however, outbreaks occasionally occur.

This distribution list covers the so-called A-D strains of the bacterium, but not the E (nursery) strains!

*This distribution list replaces all previous published EPPO Distribution Lists on *Xanthomonas campestris* pv. *citri*!*

Source: EPPO Secretariat, Paris (1993-08)



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93/143 **FUSAAL/ES...*Fusarium oxysporum* f.sp. *albedinis***
intercepted in Spain on datepalm material from Egypt

The Spanish Plant Protection Service reports that, in a collection of datepalm material imported from Egypt before 1993-06-01, and held in quarantine in Málaga, 18 plants have died as a result of serious attack by *Fusarium oxysporum* f.sp. *albedinis* (EPPO A2 quarantine pest). In 1992-12, 17 other datepalm from Egypt died from the same cause at Málaga (Puerto Banús), while in 1993-06, 10 more died at Marbella. All material concerned was destroyed by incineration. The lots were handled by different importers, who declared that they originated in different parts of Egypt.

It may be noted that, according to EPPO's existing information, *F. oxysporum* f.sp. *albedinis* is not known to occur in Egypt. This interception report awaits independent confirmation by the exporting country.

Source: Ministry of Agriculture, Madrid, ES.

93/144 **FUSAAL/MA...Genetic diversity of *Fusarium oxysporum***
f.sp. *albedinis* in Morocco

To support the search for palm cultivars resistant to *Fusarium oxysporum* f.sp. *albedinis* (EPPO A2 quarantine pest) investigations were carried out in Morocco to determine the genetic diversity of *F.oxysporum* f.sp. *albedinis*. As reported at the 6th International Congress of Plant Pathology in Montreal, a collection of 91 isolates from palms, roots and rhizosphere of wilted palm trees, roots from symptomless carriers (lucerne) and soils was constituted and subjected to restriction fragment length polymorphism (RFLP) and random amplified polymorphic DNA analysis (RAPD). Three groups were distinguished containing all isolates isolated from roots and which were closely related. A fourth group contained all the other isolates from soil. The authors concluded that such a genetic homogeneity between palm tree isolates suggests a clonal origin for the Moroccan populations of *F. oxysporum* f.sp. *albedinis*.

Source: Tantaoui, A; Fernandez, E.; Geiger, J.P. (1993) RFLP and RAPD analysis of genetic diversity in a *Fusarium oxysporum* f.sp. *albedinis* Moroccan population.
Presentation at the 6th International Congress of Plant Pathology, Montreal, CA, 1993-07/08-27/06.



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93/145 **TILCO/TILCA...*Tilletia controversa* synonymous with *Tilletia caries*?**

In Oregon, US, studies were carried out to compare the electrophoretic karyotypes of strains of *Tilletia controversa* (EPPO A2 quarantine pest) and *T. caries* in order to study the extent of genetic relatedness and to determine if the pathogens should remain classified as two species or reclassified as variants of a single species. Criteria presently used to distinguish between these two pathogens include the optimum temperature for teliospore germination, teliospore wall morphology and disease symptoms.

Results obtained in this study indicate, as reported at the 6th International Congress of Plant Pathology, that the two pathogens are not different species. The karyotypes were unique of all strains. The authors concluded that the inability to differentiate between these two pathogens using either physical attributes of the electrophoretic karyotypes or Southern hybridization analysis, and the evidence for exchange of genetic material between these two pathogens does not substantiate their being classified as separate species.

Source: Russel, B.W.; Mills, D. (1993) Synonymy of electrophoretic karyotypes among strains of *Tilletia caries* and *T. controversa*.
Presentation at the 6th International Congress of Plant Pathology, Montreal, CA, 1993-07/08-27/06.



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93/146 BURSXY...Identification of *Bursaphelenchus xylophilus*

The results of a study to differentiate *Bursaphelenchus xylophilus* (EPPO A1 quarantine pest) and *B. mucronatus* were presented at the 6th International Congress of Plant Pathology in Montreal. A French research group reported that the two species can be clearly differentiated by using a cloned MspI satellite DNA probe in a dot blot system. In Southern blot experiments, intraspecific patterns were detected among the different *B. xylophilus* isolates tested.

The authors concluded that the technique provides a sensitive and reliable method for the identification of one *B. xylophilus* individual using a simple squashed nematode procedure.

Source: Tarès, S.; Lemontey, J-M.; de Guiran, G.; Abad, P. (1993) A satellite DNA probe is able to differentiate isolates of the pinewood nematode species complex.
Presentation at the 6th International Congress of Plant Pathology, Montreal, CA, 1993-07/08-27/06.

93/147 BURSXY...Virulence of *Bursaphelenchus xylophilus*

The pathophysiological changes of pine seedlings (*Pinus thunbergii*) inoculated with virulent and avirulent isolates of *Bursaphelenchus xylophilus* (EPPO A1 quarantine pest) and an isolate of *B. mucronatus* were investigated in Japan. As presented at the 6th International Congress of Plant Pathology in Montreal, all nematode isolates caused the same cytological changes of xylem parenchymatic cells and disfunction of water conduction (cavitation and embolism) in the inner part of the xylem. Only the virulent isolate caused enhanced ethylene production, cambial necrosis and embolism of the outermost xylem. In that case, xylem embolism resulted in the decrease in the leaf water potential, cessation of photosynthesis and finally the death of the seedlings. The authors concluded that virulence of *B. xylophilus* isolates depends on the ability to induce the cambial necrosis and embolism in the outermost xylem and that these internal symptoms are closely related to ethylene production.

Source: Fukuda, K.; Suzuki, K. (1993) Pathophysiological changes of pine seedlings inoculated with virulent and avirulent isolates of pinewood nematodes.
Presentation at the 6th International Congress of Plant Pathology, Montreal, CA, 1993-07/08-27/06.



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XIPHAM/XIPHSP...Transmission of nepoviruses by *Xiphinema* spp.

A joint Scottish, Canadian and American research project was carried out to determine the specificity in transmission of North American nepoviruses by *Xiphinema* nematodes. It was reported at the 6th International Congress of Plant Pathology in Montreal, that the earlier belief in a high specificity between nepoviruses and their nematode vectors must be considered incorrect since the recent studies on three unrelated nepoviruses from N. America have indicated a comparative lack of specificity in their transmission by nematodes.

Thus populations of *X. americanum* (EPPO A1 quarantine pest) from Arkansas, California and Pennsylvania, *X. californicum* from California and *X. rivesi* from Pennsylvania, each transmitted tomato ringspot nepovirus (EPPO A2 quarantine pest), tobacco ringspot nepovirus and cherry rasp leaf nepovirus (EPPO A1 quarantine pest). Furthermore a population of *X. bricolensis* from a raspberry plantation in Washington State was found naturally transmitting at least three different serotypes of tomato ringspot nepovirus.

Source: Jones, A.T.; Brown, D.J.F.; Vrain, T.C.; Halbrecht, J.M.; Robbins, R.T. (1993) Apparent lack of specificity in transmission of North American nepoviruses by *Xiphinema* nematodes.
Presentation at the 6th International Congress of Plant Pathology, Montreal, CA, 1993-07/08-27/06.

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XIPHAM...Taxonomy of the *Xiphinema americanum* - complex

In Italy, taxonomic studies were carried out on 39 nematode species from the *Xiphinema americanum* (EPPO A2 quarantine organism) complex. As reported at the 6th International Congress of Plant Pathology in Montreal, hierarchical cluster analysis of the morphometrics of the 39 species revealed the occurrence of five subgroups in which the *X. americanum* complex can be divided:

X. americanum:

A subgroup which contains ten species described from North America, one each from Central and South America, three from Africa, one from Asia and one from Europe.

X. brevicolle:

This subgroup is composed by two species described from Asia, two from Africa and one each from North America, South America and Europe.

X. pachtaicum:

Four species described from Europe belong to this subgroup as well as two from Asia and one each from North America and Africa.

X. lambertii:

This subgroup contains four species from Asia and one from North America.

X. taylori: The smallest subgroup containing one species from North America and one from Europe.

Source: Lamberti, F.; Ciancio, A. (1993) Hierarchical cluster analysis to differentiate species within the *Xiphinema americanum* - group.
Presentation at the 6th International Congress of Plant Pathology, Montreal, CA, 1993-07/08-27/06.