ORGANISATION EUROPÉENNE ET MÉDITERRANÉENNE POUR LA PROTECTION DES PLANTES
EUROPEAN AND MEDITERRANEAN PLANT PROTECTION ORGANIZATION

EPPO

Reporting Service

Paris, 1992-04-01 Report No. 522

CONTENTS

1, rue Le Nôtre. 75016 PARIS Tél. : (1) 45 20 77 94 Fax : (1) 42 24 89 43 : (1) 40 50 62 83 Télex : 614148 OEPP F

EPPO *Reporting Service*

522/01 **CORBME/XANTVE...**New method for testing tomato seeds for *Clavibacter michiganensis* subsp. *michiganensis* and *Xanthomonas campestris* pv. *vesicatoria*

A new method has been developed in Israel to test tomato seeds for the presence of several seed-borne pathogens of tomato. Especially *Pseudomonas syringae* pv. *corrugata*, *Xanthomonas campestris* pv. *vesicatoria* (EPPO A2 organism) and *Clavibacter michiganensis* subsp. *michiganensis* (EPPO A2 organism) can be detected by this method. The method employs dry grinding, weighing, bacterial extraction and quantitative calculation on selective or semi-selective medium and enables the detection of as few as 10 colony forming units per gram of tomato seed bacteria in a 7 g tomato seed sample. With this method several seed lots which had phytosanitary certificates according to visual inspections during the growing occasion could be demasked as they were infested by one or several of the mentioned bacteria.

Source: Kritzman, G. (1991) A method for detection of seedborne bacterial diseases in tomato seeds.
Phytoparasitica 19, 133-141

522/02 **CORBSE....**Antibodies for *Clavibacter michiganensis* subsp. *sepedonicus*

In Germany, experiments were carried out to compose different antisera for the detection of *Clavibacter michiganensis* subsp. *sepedonicus* (EPPO A2 organisms). Purified antibodies raised in chicken egg yolk were compared with those raised in rabbits in three ELISA formats.

Double antibody sandwich (DAS) ELISA proved to be the most sensitive assay with a detection limit of 5×10^5 bacteria/ml sample buffer for chicken yolk antibodies composed to 1×10^6 bacteria/ml sample buffer for rabbit antibodies.

The authors concluded that chicken egg yolk antibodies were as suitable for the detection of *C.m.* subsp. *sepedonicus* as conventional rabbit antibodies, but were easier to obtain in large quantities : 100 ml antibodies raised in chicken egg yolk were prepared from 276 eggs produced by 2 hens in 30 weeks.

Source: Underberg, H.A. ; Sander, E. (1991) Detection of *Corynebacterium sepedonicum* with antibodies raised in chicken egg yolks.
Zeitschrift für Pflanzenkrankheiten and Pflanzenschutz 98, 188-196

522/03 **CSGXXX/CSTXXX....Presence of citrus greening bacterium and citrus tristeza closterovirus in India**

A survey was carried out in the North-Eastern States of India (Assam Meghalaya, Manipur and Arunadhal Pradesh) to determine distribution of citrus greening bacterium (EPPO A1 organism) and citrus tristeza closterovirus (EPPO A2 organism).

Symptoms of greening and tristeza were not observed on *Citrus macroptera* and *C. indica* growing wild in Meghalaya. Vectors of greening and tristeza, *Diaphorina citri* (EPPO A1 pest) and *Toxoptera citricida* (EPPO A1 pest), were present on most of the surveyed trees.

The authors concluded that the results indicate that citrus greening bacterium and citrus tristeza closterovirus are present in Khasi orange and that tristeza is also present in Khasi line and Assam lemon in the North-East of India.

Source: Bhagabati, K.N. ; Ahlawat, Y.S. ; Chakraboty, N.K. ; Borthakur, B.C. (1989) Distribution of greening, tristeza and mosaic diseases of citrus in North-Eastern States of India.
India Phytopathology 42, 552-555

522/04 **PSDHSO...*Pseudomonas solanacearum* on potatoes in India**

In Tamil Nadu, India, potato tubers were found to be penetrated by the weed *Cyperus bulbosus* providing *Pseudomonas solanacearum* (EPPO A2 organism) a point of entry to infect the tubers. Up to 100 % of the weed penetrated tubers developed brown rot disease.

Source: Mohan. L. ; Lakshmanan, P. (1988) A new predisposing factor for *Pseudomonas solanacearum* causing brown rot disease of potato. In : Advances in research on plant pathogenic bacteria. Based on the proceedings of the National Symposium on Phytobacteriology held at the University of Madras, March, 14-15, 1986 (edited by Gnanamanickam, S.S. ; Mahadevan, A.). New Delhi, Today & Tomorrows Printers & Publishers (1988), 73-82

522/05 **XANTCI...Taxonomy of citrus bacterial canker**

The tug of war on the taxonomy of *Xanthomonas campestris* pv. *citri* (EPPO A2 organism) goes on. In 1989, Gabriel et al. proposed a reinstatement of *Xanthomonas citri* and the creation of the *Xanthomonas campestris* pathovars *citrumelo* and *aurantifolii* (Gabriel et al.; 1989) which were formerly classified as Xanthomonas campestris pv. *citri* strains. His reclassification was based on restriction fragment length polymorphism (RLFP) analysis. Brlansky et al. (1990) supported this reclassification based on their studies in which they obtained similar results by using membrane entrapment immunofluorescence (see also Reporting Service 508/05).

Now, Young et al. (1991) suggest that the descriptions presented are insufficient in terms of modern practices for the purpose of formal classification in the genus *Xanthomonas*. The authors consider the pathovars proposed, *Xanthomonas campestris* pv. *aurantifolii* Gabriel et al. 1989, and *X. campestris* pv. *citrumelo* Gabriel et al. 1989, to be defective in terms of the International Society for Plant Pathology's standards for naming pathovars. However, the EPPO Panel on Bacterial Diseases which has met in Angers (FR) on 1992-03-25/26 considers that the strains corresponding to Gabriel et al.'s names almost certainly do justify description as different pathovars. What now remains is for these to be validly published.

Source: Gabriel P.W. ; Kingsley, M.T. ; Hunter, J.E. ; Gottwald, T. (1989) Reinstatement of *Xanthomonas citri* (ex. Hasse) and *X. phaseoli* (ex. Smith) to species and reclassification of all *Xanthomonas campestris* pv. *citri* strains.
International Journal of Systematic Bacteriology 39, 14-22.

Brlansky, R.H. ; Lee R.F. ; Civerolo, E.L. (1990)
Detection of *Xanthomonas campestris* pv. *citrumelo* and *X. citri* from citrus using membrane entrapment immunofluorescence.
Plant Disease 74, 863-868
EPPO Reporting Service 508/5 (December 1990)

Young, J.K. ; Bradburry, J.F. ; Gardan, L. ; Gvazdyak, R.I. ; Stead, D.E. ; Takikawa, Y. ; Vidaver, A.K. (1991) Comment on the reinstatement of *Xanthomonas citri* (ex. Hasse 1915) Gabriel et al. 1989 and *X. phaseoli* (ex. Smith, 1987) Gabriel et al. 1989 : indication of the need for minimal standards for the genus *Xanthomonas*.
International Journal of Systematic Bacteriology 41, 172-177

522/06 **XANTCI...*Xanthomonas campestris* pv. *citri* in the State of Paraná, Brazil**

A programme for the integrated control of citrus canker, *Xanthomonas campestris* pv. *citri* (EPPO A1 organism) has been developed for locally eradicating the organism from the State of Paraná, Brazil.

Source: Leite, R.P.T. ; (1990) Citrus canker. Prevention and control in the State of Paraná.
Circulor - Instituto Agronómico do Paraná, N°61, 51 pp.

522/07 **XANTPH...**Dectection of *Xanthomonas campestris* pv. *phaseoli*

In Australia the detection of *Xanthomonas campestris* pv. *phaseoli* (EPPO A2 organism) was investigated comparing indirect immunofluorescence microscopy (IF) and indirect ELISA with specific monoclonal antibodies.

According to the authors the IF method proved to be more reliable than the useful for detecting *Xanthomonas campestris* pv. *phaseoli* in seed lots.

Source: Wong, W.C. (1991) Methods for recovery and immunodectection of *Xanthomonas campestris* pv. *phaseoli* in navy bean seed.
Journal of Applied Bacteriology 71, 124-129

522/08 **XANTOR...**Dectection of *Xanthomonas campestris* pv. *oryzae* in rice seeds

In India, several techniques for the detection of *Xanthomonas campestris* pv. *oryzae* (EPPO A1 organism) were compared for their suitability to detect the bacteria in rice seeds.

Direct immunofluorescence was found to be the most sensitive technique enabling the detection of 10^2 cfu/ml (colony forming units per ml)

Source: Unnamalai, N. ; Mew, T.W. ; Gnanamanickam, S.S. ; (1988) Sensitive methods for detection of *Xanthomonas campestris* pv. *oryzae* in rice seeds. In : Advances in research on plant pathogenic bacteria. Based on the proceedings of the National Symposium on Phytobacteriology held at the University of Madras, March, 14-15, 1986 (edited by Gnanamanickam, S.S. ; Mahadevan, A.). New Delhi, Today & Tomorrows Printers & Publishers (1988), 73-82

522/09 **XANTOR...**Resistance of rice to *Xanthomonas campestris* pv. *oryzae*

In the Northern Caucasus area of the former USSR 15 cultivars of rice were tested for resistance to *Xanthomonas campestris* pv. *oryzae* (EPPO A1 organism) under artificial infection in field and pot experiments. Differences in type of the response were obtained, but none of the 15 cultivars proved to be immune.

Source: Zelenskiĭ, G.L. ; Matveeva; E.V. ; Mukhina, Zh. M. ; Shinkarev, V.P. (1991) Resistance of rice to Xanthomonas campestris pv. oryzae. **Selektsiya i Semenovodstvo (Moskva) 1991, N °2, 27-28.**

522/10 **XANTOR/XANTTO...*Xanthomonas campestris* pv. *oryzae* and *X. campestris* pv. *oryzicola* in West Africa**

Xanthomonas campestris pv. *oryzae* (EPPO A1 organism) and *X. campestris* pv. *oryzicola* (EPPO A1 organism) are more prevalent and severe in the Sahelian than in the forest zone of West Africa and are rarely found in the more humid zone of West Africa. Losses, due to the pathogens, were ranging from 2.7 % to 41 % in grain yield and are, in the case of *X. campestris* pv. *oryzae*, aggravated by high dosages of nitrogen.

Source: Awoderv, V.A. ; Bangura, N. ; John, V.T. (1991) Incidence, distribution and severity of bacterial diseases on rice in West Africa. **Tropical Pest Management 37, 113-117**

522/11 **XANTVE...**First record of *Xanthomonas campestris* pv. *vesicatoria* from Chile

Xanthomonas campestris pv. *vesicatoria* (EPPO A2 organism) and *Pseudomonas syringae* pv. *tomato* were for the first time isolated from tomatoes in Chile in January 1987. The symptoms were small necrotic specks surrounded by a chlorotic halo and almost leaf blight. Small cankered lesions appeared on fruits, some with a pronounced yellow to green halo.

Source: Latorre, B. ; Lolas, M. (1988) Identification of bacterial spot and bacteriel speck of tomato.
Ciencia e Investigacion Agraria 15, 151-157

522/12 **COCHCA....*Cochliobolus carbonum* pathogenic to rice**

In Japan experiments showed that *Cochliobolus carbonum* (EPPO A2 organism) which was originally reported as a maize pathogen only, also shows a high pathogenity to rice. Race 3 of the pathogen produces spore germination fluids which are specifically phytotoxic to rice leaves and cause a leaf chlorosis of the leaf as well as enable non-pathogenic *Alternaria alternata* and *Cochliobolus victoriae* to infect the leaf tissue.

Source: Xiao, J.Z. ; Tsuga, F. ; Doke, U. ; Nakabuka, S. ; Tsuda, M. ; Nishimura, S. (1991) Rice-specific toxins produced by Bipolaris zeicola, race 3 ; evidence for role as pathogenicity factors for rice and maize plants.
Physiological and Molecular Plant Pathology 38, 67-82

522/13 **DIAPPS...**Biological aspects of *Diaporthe phaseolorum* var. *sojae*

In Romania, experiments were carried out to determine nutritional and physical factors in the development of *Diaporthe phaseolorum* var. *sojae* (EPPO A2 organism).

The fungus sporulated well on potato glucose agar medium as well as agarized fragments of soy bean stems and petioles, favourably at temperatures ranging between 20-28° C and pH values of 6-8. Polysaccharides and monosaccharides were most easily assimilitated among the carbon source, as were amides and nitrates among the nitrogen sources.

Source: Pelmus Anicuta, P.V. (1990) Aspects on the biology of the pathogen *Diaporthe phaseolorum* var. sojae.
Probleme de Protectia Plantelor 18, 277-283

522/14 **DIPDMA....**Survival of *Stenocarpella maydis*

The survival of *Stenocarpella maydis* (EPPO A2 organism) was investigated in South Africa. The relationship between the maize stubble placement in soil and the survival and pycnidium production by the pathogen were the main objectives of this investigation.

Survival was higher in stubble which remained on the soil surface than in burried stubble. Pycnidial development increased on surface and buried stubble from September onwards, but subsequently decreased on buried stubble. Reisolation and conidium viability of the fungus was higher from surface stubble than from buried stubble.

Source: Flett, B.C. ; Wehner, F.C. ; Smith, M. F. (1992) Relationship between maize stubble placement in soil and survival of *Stenocarpella maydis* (*Diplodia maydis*)
Journal of Phytopathology 134, 33-38

522/15 **FUSAAL...**Sebkha salts suppress *Fusarium oxysporum* f. sp. *albedinis*

In Timimoun, East Algeria, experiments showed that sebkha salts (salt precipitated from dried pools) in the soil at concentrations > 1 % significantly reduced the inoculum density of *Fusarium oxysporum* f. sp. *albedinis* (EPPO A2 organism). At a concentration of 1.4 % the fungus was completely suppressed in a period of 75 days. Similar effects were observed on *F. oxysporium* f. sp. *lini* and the authors concluded that date palms in Eastern Algeria can be partially protected against the Bayoud disease by the sebkha salts.

Source: Amit, H. ; Riba, O. (1990) Influence de la salinité des sols de palmeraies sur les *Fusarium*. II Action des sels de sebkha sur l'évolution dans le sol de 2 souches de *Fusarium oxysporum* pathogènes.
Revue d'Ecologie et de Biologie du Sol 27, 147-158

522/16 **NEOVIN...**Rating scale for *Tilletia indica*

In India, a rating scale was developed for identifying wheat cultivars resistant to *Tilletia indica* (EPPO A1 organism). Rated were the severity by measuring bunted grains per spike and the response of wheat to *T. indica* by measuring the extent of damage to the grains. Severity and response were used to evaluate resistance by calculating a coefficient of infection. As a result wheat cultivars were classified into 5 classes ranging from highly resistant to higly susceptible.

Source: Ausla, S.S. ; Indu Sharma ; Singh, B.B. (1989) Rating scale for identifying wheat varieties resistant to Neovisse indica.
Indian Phytopathology 42, 161-162

522/17 **NEOVIN...**Screening for resistance of wheat to *Tilletia indica*

In Mexico, experiments were conducted to screen wheat for resistance to *Tilletia indica* (EPPO A1 organism). During 1985-87, 4000 bread wheats , durum wheats and triticale lines were screened under natural conditions and boot inoculation.

Triticale showed the highest proportion of resistant lines followed by durum wheats. Several moderately resistant bread wheat lines with various components that contribute to the resistance were identified, however, no bread wheat line was completely free of Karnal bunt.

Source: Singh, D.V. ; Dhaliwal, H.S. (1989) Screening of wheat germplasm for components of resistance to Karnal bunt disease.
Indian Phytopathology 42, 393-399

522/18 **TILLCO...**Seed dressings against *Tilletia contraversa*

Experiments were conducted in Sweden to test the efficacy of three seed dressing to control *Tilletia contraversa* (EPPO A2 organism).

The most successful seed dressing in controlling *T. contraversa* was a dressing consisting of bitertanol and fuberidazole which reduced the disease by 93 %. If this seed dressing was applied to a wheat cultivar which was resistant to dwarf bunt (Tjelvar) the control efficacy rose to 99.6 %.

Source: Johnsson, L. (1991) Experiments with seed-borne and soil-borne dwarf bunt (*Tilletia contraversa* Kühn) in winter wheat in Sweden.
Zeitschift für Pflanzenkrankheiten und Pflanzenschutz 98, 162-167

522/19 **BEMITA....*Bemisia tabaci*** present in New Zeland

It has been reported that ***Bemisia tabaci*** (EPPO A2 pest) has been newly identified in New Zealand.

Source: Anonymous, Annual Report of the National Agricultural Security Service: 1990-1991
Sentinel N° 16 (1991), 4-6

522/20 **TRIOER....**Biological studies on *Trioza erytreae*

Intensive studies on the ecology of *Trioza erytreae* (EPPO A1 pest) have been carried out in South Africa. Investigated were mating, fertility and oviposition of adults as well as settling and the general behaviour of nymphs.

Under field conditions first instar nymphs usually settle on the ventral side of leaves. Many of these nymphs are able to disperse over a distance of 300 mm before settling. Compared to nymphs that developed on stems, those that developed on leaves moved around less, completed their development in a shorter period and when they became adults, the males had larger forewings. First instar nymphs apparently orientate themselves by the leaf roughness to settle on the ventral surface. Light seems to help them but gravity plays no role in this. Of psylla nymphs on the ventral side of leaves, 7.2 % vacated their galls and 11.8 % moved their positions in the gall per day indicating that nymphs are only partially sedentary. Significantly less nymphs completed their development on young branches than on either the ventral or dorsal sides of leaves.

Males of *Trioza erytreae* are the aggressors during mating. From time to time they become restless and wander around on the plants, presumably in search of females. During these periods a male often searches a number of leaves and attemps to mate with any adult psylla, male or female, or with mating pairs which it encounters. He may also try to mate with aphids and can become stuck to the aphid's siphunculi. Copulation lasts on average 5 min 32 s at 21°C to 26°C. It takes 29 s to lay an egg, followed by a delay of 23 s before the next egg is oviposited.

Males become sexually mature on the same day that they become adults, and females on the second and third day after the final moult. A female can mate without leading to fertilization. In most cases the duration of mating does not determine whether a female is fertilized or not. A single successful mating enables a female to ley eggs for 16 $\pm$ 1.5 days (S.E.) or to fertilize a mean of 591 $\pm$ 60.8 eggs. As females lay from 102 to 2335 eggs (mean 982), they will have to mate twice on average, but up to four times to be

fertilized fully. There are indications that overwintering females will have to mate within about a month previously for the eggs to be fertile. One male has the ability of fertilize one but not more than four females to their full capacity. A 95,9 % hatching was observed in field collected eggs. On citrus, eggs are mostly laid on the tips of shoots, young leaves, stems and thorns. They may also be deposited on citrus flower buds and on lemon fruit.

Source: Van den Berg, M.A. ; Deacon, V.E. ; Thomas, C.D. (1991) Ecology of the citrus psylla, *Trioza erytreae* (Hemiptera : Triozidae). 3 Mating, fertility and oviposition.
Phytophylactica 23, 195-200
Van den Berg, M.A. ; Deacon, V.E. ; Thomas, C.D. (1991) Ecology of the citrus psylla, *Trioza erytreae* (Hemiptera : Triozidae). 4. Settling and general behaviour of nymphs
Phytophylactica 23, 201-208