(CMV) was 10.9% in 2002, and 76.0%, 11.1%, and 2.4% in 2003, respectively.

4-53. Multiplex Reverse Transcription Polymerase Chain Reaction Assay for Simultaneous Detection of Five Cucurbit-infecting Viruses.

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A single-step multiplex reverse transcription polymerase chain reaction (RT-PCR) assay was developed for the simultaneous detection of five cucurbit-infecting viruses: cucumber mosaic virus (CMV), watermelon mosaic virus 2 (WMV2), zucchini yellow mosaic virus (ZYMV), cucumber green mottle mosaic virus (CGMMV), and kyuri green mottle mosaic virus (KGMMV). The multiplex RT-PCR provides a simple and rapid method for detecting various viruses in cucurbit plants, which will help diagnose many cucurbit plants at a time.

4-54. Characterization of *Carnation mottle carmovirus*(CarMV) Isolated from *Lilium spp.* in Korea

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Carnation mottle carmovirus(CarMV) was isolated from *Lilium spp.* in Korea. This isolate, CarMV, was done bioassay, which plants were *Dianthus caryophyllus, Gomphrena globosa, Chenopodium amaranticolor, Dianthus chinensis.* CarMV was propagated on the leaves of *Chenopodium amaranticolor* with the crude-sap inoculation method and purified by Mossops method(1976). We produced antiserum against CarMV and analyzed the antiserum specificity with ELISA, Gel diffusion method, and Rapid Immunofilter Paper Assay (RIPA). From these results of the assay, RIPA method was simple and rapid for CarMV detection. We have established successfully the CarMV detection system. CarMV coat protein gene was amplified by RT-PCR with specific primers and sequencing analysis was done.

4-55. A simple method for detection of CMV viral RNAs and satellite RNAs in Korean pepper.

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To analyze the genome of *Cucumber mosaic virus*(CMV) in pepper, we developed a new extraction method for double-stranded RNA(dsRNA). To isolate the dsRNA, 0.1g of pepper leaves homogenized with 1ml of 5×EXB extraction buffer[0.5M glycin, 0.5M NaCl, 5mM EDTA(pH9.0/NaOH), 10% Sodium N-lauryl salcosinate(NLS), 10% Sodium dodecylsulfate(SDS)] and

purified with the 1/4 volume of phenol : chloroform : isoamylalcohol(25:24:1). dsRNAs from the aqueous phase was precipitated with isopropanol. This procedure was able to detect a minimal amount of dsRNA from CMV infected plant tissue and to distinguish different CMV satellite RNAs by polyacrylamide gel electrophoresis(PAGE). Moreover, this method can be applied CMV infected in pepper or *Rice dwarf virus* (RDV) infected rice.

4-56. Identification of Chinese Yam Necrotic Mosaic Virus(ChYNMV) infecting Chinese yam(*Dioscorea opposita* Thunb. cv. Jang-Ma) in Korea.

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Chinese yam(*D. opposita* Thunb. cv. Jang-Ma) plants showing necrotic mosaic symptom were collected from their growing fields in Andong, Korea. Electron microscoptic examination of negatively stained preparations showed filamentous particles of 660nm in length. The virues purified partially were used to isolate Viral RNA as template for RT-PCR to amplify the CP gene with ChYNMV specific and oligo dT primers. Amino acids sequeces revealed that the viruses shared 99.3% similarity with ChYNMV(AB044386) which was known as the member of macluravirus. So the viruses from Chinese yam(*D. opposita* Thunb. cv. Jang-Ma) plants were identified as ChYNMV. Comparing the amino aced sequences of ChYNMV strains with other macluraviruses such as CdMV, NLV and MacMV revealed that N-terminal was the most variable region and conserved regions were present within the genus Macluravirus.

4-57. Mycological characteristics and Pathogenicity of *Mycosphaerlla brassicicola* isolated from the Imported Chinese cabbage.

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One fungus was isolated from lesions on imported chinese cabbage leaves in process of quarantine inspection from China. The fungus was identified as *Mycosphaerlla brassicicola*, based on morphology of perithecia, asci, ascospore, and curtural characteristics. In Korea, this fungus has been quarantine fungus, and not yet report to occur. Perithecia of the fungus were globose, dark brown with apical papilate ostioles. The size was 90-100 x 130-135㎛. Asci were bitunicate, 8-spored and 38-43 x 15-19㎛. Ascospore were irregularly biseriate, hyaline, cylindrical, 2-celled, and rounded at the ends. Optium growth temperature of the fungus was at 20℃ on PDA but did rarely grow over 24℃. Colony on PDA was of black aerial mycelia.