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Ecological and Virological Monitoring of Vegetables, Ornamental Crops and Wild Plants in the Southern Part of the Russian Far East

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Abstract: Recently the phytosanitary situation in the plantings of major vegetables (cabbage, melons, green crops, etc.) and ornamental plants is stably critical in the South part of the Russian Far East. Nevertheless, it is possible to predict outbreaks of dangerous epiphytotic that is confirmed by our data obtained during ecological and virological examination of plants (2001-2018).

During this study we have revealed that the most prevalent viruses were Cucumber mosaic virus (CMV) (*Bromoviridae*, *Cucumovirus*) and Tobacco mosaic virus (TMV) (*Virgaviridae*, *Tobamovirus*): the first one affects plants from the family *Cucurbitaceae*, the second one – *Solanaceae*. Both viruses cause leaf signs such as spotting, deformation, mottling, necrosis and curvature of the fruit in plants, ovaries are often falling off. Nowadays, another dangerous pathogen is often registered among the members of *Cucurbitaceae* family – Watermelon mosaic virus (WMV) (*Potyviridae*, *Potyvirus*). The major vectors transmitting CMV and WMV are different species of aphides (*Hemiptera*, *Aphididae*), which disperse viruses from perennial wild, weedy, and ornamental plants. TMV is the most contagious virus, which could be spread via vegetative reproduction, seeds; however, contacts are the main pathway of TMV distribution. In the Southern part of the Russian Far East Cauliflower mosaic virus (CaMV) (*Ortervirales*, *Caulimoviridae*, *Caulimovirus*), Radish mosaic virus (RaMV) (*Comoviridae*, *Comovirus*), and Turnip mosaic virus (TuMV) (*Potyviridae*, *Potyvirus*) were detected. Most often these viruses were found in the suburbs of Artyom and Vladivostok as well as in the Ussuri district. CaMV was identified on ornamental perennial (dahlia, gladiolus, primrose, Alpine aster) and annual (biennial) (snapdragon, Petunia hybrid, mallow, zinnias) cultures.

During the phytosanitary monitoring we paid special attention to the examination of wild and weed vegetation because these plants are usually the reserves of viral infection and insect vectors. In 2017 the evaluation of non-timber forest products (Ussuri, Nadezhdinskiy, Anuchinskiy districts and suburbs of Vladivostok) showed that in comparison with previous years the number of natural foci of plants with viral symptoms are increased. We also identified local lesions of Asian plantain, Hogweed, Angelica, Adenocaulon, and Geranium.

The exchange of seed material from different regions of Russia and foreign countries had been increasing; cases of unauthorized import of seed material that has not passed the purity control have become more frequent. Thus, entered quarantine pests, virus diseases, previously not appeared in the Far East. Their invasions are characterizing by scale and intensity, which is a real threat for agrobiocenoses.

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