PROCEEDINGS

of the 4th International conference

"Plant Genetics, Genomics, Bioinformatics and Biotechnology"

(PlantGen2017)

Best Western Plus Atakent Park Hotel

May 29 – June 02, 2017,

Almaty, Kazakhstan

УДК 581 (063)

ББК 28.5

Р71

"Plant Genetics, Genomics, Bioinformatics and Biotechnology": Материалы Международной конференции 4th International conference PlantGen2017 / *под общей редакцией Е.К. Туруспекова, С.И. Абугалиевой.* – Алматы: ИББР, 2017 – 216 с.

ISBN 978-601-80631-2-1

В сборнике представлены материалы 4 Международной конференции по генетике, геномике, биоинформатике и биотехнологии растений (**PlantGen2017)**, проведенной в г. Алматы 29 мая -2 июня 2017 г. В публикациях изложены результаты оригинальных исследований в области изучения, сохранения и использования генетических ресурсов, генетики и селекции, биоинформатики и биотехнологии растений.

Сборник рассчитан на биологов, генетиков, биотехнологов, селекционеров, специалистов, занимающихся генетическими ресурсами растений, и студентов биологического и сельско-хозяйственного профиля.

Тезисы докладов представлены в авторской редакции.

***Рекомендовано к изданию Ученым советом РГП «Института** биологии и биотехнологии растений» Комитета науки Министерства образования и науки Республики Казахстан* (Протокол № 2 от 04.05.2017 г.).

УДК 581 (063)
ББК 285

ISBN 978-601-80631-2-1

Proceedings of the 4th International Conference "Plant Genetics, Genomics, Bioinformatics and Biotechnology" (PlantGen2017)

May 29 – June 02 2017 – Almaty, Kazakhstan

Editors

Yerlan Turuspekov, Saule Abugalieva

Publisher

Institute of Plant Biology and Biotechnology

Plant Molecular Genetics Lab

ISBN: 978-601-80631-2-1

Responsibility for the text content of each abstract is with the respective authors.

Date: May 29 – June 02 2017

Venue: Best Western Plus Atakent Park Hotel, 42 Timiryazev str., 050040 Almaty, Kazakhstan

Conference webpage: http://primerdigital.com/PlantGen2017/en/

Hosted by: Institute of Plant Biology and Biotechnology (IPBB), Almaty, Kazakhstan

IPBB

Correct citation: Turuspekov Ye., Abugalieva S. (editors) (2017) Proceedings of the 4th International conference "Plant Genetics, Genomics, Bioinformatics and Biotechnology" (PlantGen2017), Almaty, Kazakhstan, May 29 – June 02 2017, IPBB, Almaty, Kazakhstan; ISBN 978-601-80631-2-1

ISBN 978-601-80631-2-1

PLANT VIRUSES AND THEIR INTERACTION WITH PLANT COMMUNITIES OF FAR EAST OF RUSSIA

T.I. Pleshakova, Z.N. Kozlovskaya, V.F. Tolkach, Y.G. Volkov, N.N. Kakareka, A.V. Gapeka, M.Y. Shchelkanov

Federal Scientific Center of the East Asia Terrestrial Biodiversity, Far Eastern Branch of Russian Academy of Sciences, Vladivostok, Russia

A large number of phytopathogenic viruses harmful for most agricultural plants is described here. Very important is the fact that besides direct harm to the productivity of plants these viruses reduce resistance against adverse habitat conditions – deficiency or excess of water, changes in insolation, higher content of pollutants, *etc*. Even latent viral infection in adverse conditions can cause a serious disease. Many viruses quickly penetrate into natural plant communities and form constant local foci of infection.

East Asia is recently notable for an intensive exchange of commercial agricultural products, as well as samples of agricultural and ornamental plant species. Since viruses can be transferred by vegetative parts and by true seeds, an invasion of these pathogens to new territories with planting stock is observed. These are the most dangerous being new for stable natural and anthropogenic plant communities.

We regularly monitored phytosanitary condition of agricultural crops and natural plant communities in farms cultivating large range of crops using seeds and planting material imported from other regions and from abroad. The list includes more than 10 crop cultures. We also studied farms and organizations involved in breeding, seed production, and marketing of their products. At the same time, a lot of plants with virus-like symptoms were revealed: garlic, pepper, tomato, eggplant, cucumber, cilantro, plantain, and commelina.

In addition, to detect viral diseases in many districts of Primorsky Krai industrial crops of most important cereals were surveyed, as well as adjacent forest stands and shelterbelts, meadows and silage grass, and selection and crop areas of wheat, barley and oats in Primorsky Research Institute of Agriculture. There were revealed several dozens of different isolates of virus diseases of cereals.

Also private collections of ornamental plants were surveyed: dahlias, asters, irises, gladioli, petunia hybrids, primroses, roses, hydrangea, peach-leaved campanula and lilies. A number of plants of these species with virus-like symptoms were detected.

Electron-microscopic analysis of preparations of most of the studied crops revealed various types of virions: filamentous, rod-shaped and isometric, indicating that phytoviruses are widespread among the introduced plant material.

Further studies revealed that some pathogens are new to the region or primarily encountered in the new hosts. Therefore, there were identified more than 10 new strains of cucumber mosaic virus, new strains of potyviruses. For the first time, tomato aspermia virus was identified in lettuce, carrot and parsley in the Russian Far East. Garlic cultivated from imported planting material revealed new harmful strains of onion yellow dwarf virus and latent garlic virus. Several strains of viruses new for the Far East were identified in cereal crops: dwarf corn mosaic, cucumber mosaic and tobacco ringspot. The agents of natural focal diseases are nepoviruses transmitted with soil that, according to our data, affect many horticultural crops.

It is concluded that all new viruses introduced with planting material cause serious diseases and often spread rapidly, forming local epiphytoties. On the other hand, imported plant material can be heavily infected by local strains and viruses, for example lagenaria and fenugreek imported for testing as new cultures.

Monitoring of collections and nurseries revealed that it is difficult and sometimes impossible to conduct breeding work to produce new varieties under transmission of viral infections.

Thus, to improve the quality of selection and seed-growing, the nurseries must be protected from invasion of phytoviruses.