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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 сельскохозяйственного профиля.

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**ECOLOGY AND ECONOMICAL IMPACT OF BARLEY
STRIPE MOSAIC VIRUS (*VIRGAVIRIDAE, HORDEIVIRUS*)
IN THE PRIMORSKY KRAI OF RUSSIA**

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Barley stripe mosaic virus (BSMV) (*Virgaviridae, Hordeivirus*) is common in agrocenoses infecting wide spectrum of cereals with barley and wheat being described as the main hosts. The typical symptoms of BSMV-associated disease are from small light-green or chlorotic stripes or streaks to chlorosis and necrosis and stunted growth of plants. Unlike many phytoviruses BSMV is not proved to have any vectors – this virus could be transmitted by contact of sick and healthy plants, through the seeds and the pollen. But some important ecological aspects of BSMV and its harmfulness are yet to reveal nowadays. In order to obtain a higher yields these aspects need to be considered according to regional specifics.

Materials and methods. Annual phytovirological monitoring with visual assessment and a detailed accounting was carried out in the sown crops of winter and spring barley, winter wheat and spring wheat, spring oats, maize. Plants or leaves with viral infection-like symptoms were transported to the Laboratory of virology for identification by indirect ELISA with specific antisera, electron microscopy (Libra 200 FE HT in the Center for Electron Microscopy of Far Eastern Branch of Russian Academy of Sciences) and other standard virology methods. To determine the BSMV-infected maize yield loss, seeds of maize were planted out in experimental plot: 100 control seeds and 200 experimental seeds for inoculation. The experimental seedlings were infected on the 26-th day after planting, with the infection development being checked by indirect ELISA on the 14-th and 28-th day after the inoculation.

Results and discussion. We revealed that BSMV infects barley (14.3-41.6 %), oats (8.3-21.4 %) and wheat (16.7-59 %) more often in relation to other cereals and other cereal viruses on the territory of Primorsky krai. Infection load in the productive agricultural cereal crops is lower than in the selection and collection nurseries. It could be explained due to the ability of the virus to be transmitted through seeds and higher sowing density in productive agricultural cereal crops in comparison to experimental stations where low sowing density creates good conditions for potential active insect-vectors. Maize (*Zea mays*) is one of the most important cereal crops for the agricultural industry of Primorsky krai. Some authors mention maize as an experimental BSMV host. We have found plants of maize with yellow or white streak and identified BSMV-associated disease. Thus we have revealed that maize is a natural host of BSMV. Infection of productive agricultural crops of maize is significantly lower than the selection and collection nurseries of the experimental station of Primorsky Research Institute of Agriculture. We have found symptoms and proved BSMV-disease by laboratory methods in the surrounding weed *Setaria pumila* (Poir.) Roem. Et Schult.(= *S. Glauca* (L.) Beauv.) as well (51.6 % positive plants). This species was indicated as BSMV host for the very first time. There were no any observed mechanical contacts between maize and weed plants, which implies that virus vector took place. We have found flying and parthenogenesis forms of aphids on the glue traps in experimental plots, on experimental plants and on *S. pumila*. Under laboratory conditions BSMV was transmitted by aphids on wild plants of genus *Poaceae: Echinochloa crusgali* (L.) Roem. (*Echinochloa crus-galli*) and *Phleum pratense* L. The loss of maize yield is about 30-60 % which is the direct proportional dependence to the infection rate.

Conclusion. BSMV is a harmful viral disease, which can cause significant economic damage. Infected viral particles are determined in all parts of the seed and the pollen. Because of seed and mechanical transmission, the virus is involved in the selection process.