

THE FEDERAL SCIENTIFIC CENTER ON THE EAST ASIA TERRESTRIAL
BIODIVERSITY FEB RAS, RUSSIA
ENGINEERING RESEARCH CENTER OF CHINESE MINISTRY OF EDUCATION
FOR EDIBLE AND MEDICINAL FUNGI, CHINA

The 1st International Conference on

NORTH EAST ASIA BIODIVERSITY

SEPTEMBER 17–21, 2018
VLADIVOSTOK, RUSSIA



VARIETY OF VIRUSES AFFECTING NATURAL FLORA OF NORTH-EASTERN ASIA

Yury G. VOLKOV¹, Nadezhda N. KAKAREKA¹, Zinaida N. KOZLOVSKAYA¹,
Mikhail Yu. SHCHELKANOV^{1,2,3}

¹ Federal Scientific Center of the East Asia Terrestrial Biodiversity, FEB RAS, Vladivostok, Russia

³ Federal Budget Institution of Health "Center for Hygiene and Epidemiology in Primorye Territory", Vladivostok, Russia.

Viral diseases of wild plant species, which may serve as reservoirs of infection for cultivated plants, have been monitored in the Far East since 1962. Nowadays, more than 200 viruses were documented. Representatives of *Fabaceae* and *Asteraceae* are the most virophylic.

In laboratory studies, using various diagnostic methods, viral etiology has been proven for more than 40 diseases of wild plant species. The study of biological, physical, chemical, and immunological properties of a number of viruses made it possible to identify new viruses and strains belonging to different taxa.

The genus *Potyvirus* is the most widely represented. The foci of the potato Y-virus were registered among *Humulopsis japonica*, *Agrimonia pilosa*, and *Paeonia lactiflora*.

Pathogens, which infect 6 clover species (*Trifolium hybridum*, *T. pratense*, *T. repens*, *T. montanum*, *T. lupinaster*, and *T. montanum*) from various regions of the Far East were identified as potyviruses. Virus from *T. montanum* was identified as a new member of genus *Potyvirus*.

It was believed that the soybean mosaic virus (SMV) from this genus does not have other host plants other than cultivated soybean and that the infection is transmitted via seeds. However, two cases of SMV detection were registered for wild soybean plants (*Glycine ussuriensis*).

Potexvirus, which causes mosaic in *Plantago asiatica*, is represented by two strains (Primorskyi and Sakhalinskyi). In Amur Region, this plant has been diagnosed with a disease caused by a joint infection of a new strain of tobacco mosaic virus, called Amurskyi, and virus potato Y-virus serogroup.

Two bromoviruses were identified: *Vicia unijuga* mosaic virus (MVVU) was represented by four strains (mosaic, necrotic, spotted and Amurskyi); the other – as brome mosaic virus in wild-growing cereals *Elytrigia repens*, and *Spodiopogon sibiricus*. One of the MVVU isolates together with the main virus contained virions of a smaller size (16–17 nm) – presumably of a satellite, which was previously documented only for the tobacco necrosis virus.

Vicia pseudorobus was infected by carlavirus related to the pea streak virus.

Cucumber mosaic virus (CMV) (*Bromoviridae*, *Cucumovirus*) was the most widespread among wild plants: *Arctium lappa*, *Taraxacum officinale*, *Sonchus oleraceus*, and *Filipendula sp.*. CMV was also observed in annual weed plants of *Sigesbekia pubescens*, *Amaranthus caudatus*, and *Galinsoga parviflora*. CMV was

revealed in *Prenanthes tatarinowii*, *Vicia unijuga*, *Arctium lappa*, *Armeniaca sibirica* at the forest edges and among the windbreak.

We identified several diseases of natural flora caused by pathogens from the genus *Nepovirus*: tobacco ringspot virus discovered in *Syringa amur ensis* and *Doellingeria scabra* as well as new *Phryma asiatica* mosaic virus.

A new viral isolate with filamentary particles (1000–1200 × 10–12 nm) was detected in *Vicia unijuga*. It was presumably identified as a member of *Closteroviridae* family.

The study was supported by Russian Foundation for Basic Research, project 8-016-00194_a.