had low levels of antibodies to all three types of polioviruses, only a small percentage (1.4% -2.8%) of subjects had high titers of antibodies, antibodies to polio type were absolutely absent.

1. Задорожна В.І., Дранц С.І., Бондаренко В.І. Сучасна концепція епіде-
міологічного нападу та профілактика ентеровірусних інфекцій. Матері-
али доповідей науково-практичної конференції "Чення Л.В. Громадян-

DISTRIBUTION OF CACTUS VIRUS X IN SOME BOTANICAL GARDENS OF UKRAINE

Проведено обследование растений семейства Цактаксеа в коллекциях Никитского ботанического сада и ботанического сада Харьковского национального университета имени Н.В. Каразина. Описана симптомы идиформированных растений. Способ возбудителей исследовал с помощью растений-индикаторов, непрямого ИФА и трансмиссионной электронной микроскопии. Опираясь на серологические, биологические и морфологические характеристики изо-
лированного вируса, мы можем предположить, что данный патоген является родственным X вирусу кactus.

Screening of Cactaceae on virus diseases in the collections of Nikitsky Botanical Garden and Botanical garden of Karasin’s Kharkiv National University has been conducted. Different symptoms were detected on virus-infected plants. To define properties of the indicated pathogen methods of host assay, indirect ELISA and transmission electron microscopy were employed. Basing on serological, biological and morphological properties, we suggest that isolated virus is related to Cactus virus X.

Introduction. The culture of cactuses in modern floriculture occupies one of leading places. In accordance with literary data about 10 viruses are able to affect the members of Cactaceae family: Cactus virus X, Schlumbergera virus X, Opuntia virus X, Zygocactus montana virus X, Sa-
guaro cactus virus, Sammons’ O puntia virus, Cactus virus 2 (CV2), Cactus mild mottle virus, Impatiens necrotic spot virus and Tomato spot wilt virus [3,4]. Among them Cactus virus X is one of most dangerous. Cactus virus X is trans-
mitted by mechanical inoculation, grafting and by contact between plants. [1,5,6]

Materials and methods. We have been collected plants with virus-like symptoms: Mamillaria microhelia, Ausrocylindropuntia tunicata, Monvillea sp., Sulcorebutia sp., Bolivicereus samupatanus, Opuntia sp., Ferocactus sp., Thelocactus chrenbergii, Trichocereus bridgesii, Ma-
millaria magnimamma, Agave furcrea, Opuntia sp., Cereus sp., Astrophytum capricorne, Cereus sp., Astrophytum myriostigma, Astrophytum myriostigma v. nudum from greenhouse collection of Nikitsky Botanical Garden and Ritterocereus pruinosis from the collection of Karazin’s Botanic Garden of Kharkiv National University) we observed mosaic symptoms, on other plants (Ausrocylindropuntia tunicata, Monvillea sp., Sulcorebutia sp., Bolivicereus samupatanus, Opuntia sp., Astrophytum myriostigma v. nudum from greenhouse collection of Nikitsky Botanical Garden) – symptoms of necrosis (Fig.1,2).

Results and discussion. Cactus plants demonstrated different symptoms of virus infection. On some plants (Mamillaria microhelia, Ferocactus sp., Thelocactus chren-
bergii, Trichocereus bridgesii, Mamillaria magnimamma, Agave furcrea, Opuntia sp., Cereus sp., Astrophytum capricorne, Cereus sp., Astrophytum myriostigma from greenhouse collection of Nikitsky Botanical Garden and Ritterocereus pruinosis from the collection of Karazin’s Botanic Garden of Kharkiv National University) we observed mosaic symptoms, on other plants (Ausrocylindropuntia tunicata, Monvillea sp., Sulcorebutia sp., Bolivicereus samupatanus, Opuntia sp., Astrophytum myriostigma v. nudum from greenhouse collection of Nikitsky Botanical Garden) – symptoms of necrosis (Fig.1,2).

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To define biological properties of the pathogens, we conducted a host assay using indicator plants. Indicator plants were inoculated with sap obtained from cactus plants demonstrating virus-like symptoms. Necrotic local lesions observed on Chonopodium murale and Gomphrena globosa were typical for Cactus virus X (CVX) [5,6]. In indirect ELISA we observed positive reactions with sap Mamillaria microhelia, Cactobutyta sp., Bolivicereus samupatanus, Opuntia sp., Ferocactus sp., Mamillaria magnimamma, Opuntia sp., Cereus sp., Astrophytum capricorne, Astrophytum myriostigma and Ritterocereus prunosus with antiserum to Potato virus X (PVX, which is serologically related to Cactus virus X).

Summarizing the obtained results it is possible to assert that collections of Nikitsky Botanical Garden and Botanical garden of Karazin’s Kharkiv National University were contaminated with Cactus virus X. Exchange collection material without testing on virus infection, can increases chances of uncontrolled distribution of viral infections. Some infections are symptomless. In this case the asymptomatic virus infection in cactus makes a danger because these plants can become the source of distribution pathogens in collections. In addition, cactuses could support reproduction of viruses other types of plants and, thus, be the reservoirs of plant virus infections. A timely exposure and permanent control of the state of population of these cultural plants is the obligatory link of the system of protecting from this pathogens. In addition, cactuses could support the reproduction of viruses of terrestrial orchids of temperate zone can become the source of distribution pathogens in collections. In addition, cactuses could support the reproduction of viruses other types of plants and, thus, be the reservoirs of plant virus infections. A timely exposure and permanent control of the state of population of these cultural plants is the obligatory link of the system of protecting from this group of pathogens.

Comparing the results of bioassay and ELISA tests we focused on samples of Mamillaria microhelia, Cactobutyta sp., Bolivicereus samupatanus, Opuntia sp., Ferocactus sp., Mamillaria magnimamma, Opuntia sp., Cereus sp., Astrophytum capricorne, Astrophytum myriostigma and Ritterocereus prunosus from collection of Nikita Botanical Garden and Ritterocereus prunosus from the collection of Karazin’ Botanic Garden of Kharkiv National University. These plants were probably infected with CVX. To confirm our assumption about CVX infection and to study the morphology of the pathogen we carried out transmission electron microscopy. In sap of all plants we registered filamentous viirons with size 580×13 ± 2 nm (Fig.3), which is typical for Cactus virus X.

Fig.3. Electron micrograph of flexible particles from plant material from Ferocactus sp.


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**ELECTRON MICROSCOPY AND BIOLOGICAL PROPERTIES OF THE PATHOGEN AFFECTING PLATANTHERA BIFOLIA**

**Introduction.** Orchidaceae Juss. is one of the biggest families of flowering plants which includes about 35 000 species. They can be found all over the world excluding deserts and Polar Region [2]. Viral diseases of orchids are known from the middle of XX century [4]. Until now more over 30 viruses of orchids have been described [8, 10]. The majority of these viruses were detected as pathogens of tropical orchids which are cultivated in situ. On the other hand the viruses of terrestrial orchids of temperate zone are studied not enough. The infection of Cypripedium sp., Orchis sp., Ophrys sp. by Tobacco rattle (TRV) and Turnip mosaic virus (TuMV) were described [5]. Also the antigens