

BRIEF COMMUNICATION

Euonymus mosaic

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Abstract. The Euonymus Mosaic Virus was isolated from *Euonymus europaea*. The virus was transmitted by sap to cucumber and other test plants, by seeds or *Aphis euonymi* F., and it was soilborne, too. The sap from cucumbers lost its infectivity after 10 minutes at 80 °C and after 35 days at 20—22° C. It is probably a new virus so far not described. The investigations of this problem are not finished, yet.

Euonymus europaea L. (Celastraceae) is a plant with a rare occurrence of virus diseases. In Czechoslovakia some disease symptoms of a mosaic type have been observed (BOJŇANSKÝ et al. 1963 and BLATNÝ's personal report). The proof of a virus disease was not given. From the experimental point of view the disease has not been investigated. The Euonymus infectious variegation (*Marmor euonymi* HOLMES) was described on related species *E. japonica* L. var. *aureomarginata* T. MOORE and *E. fortunei* var. *radicans* (MIG.) REKD. (BAUR 1908, BRIERLEY 1944). In Ivanka pri Dunaji, during the summer of 1967, we found in nature some bushes of *E. europaea* with mosaic symptoms on leaves and we tried to identify the origin.

The disease symptoms on *Euonymus europaea*

On the whole leaf blade or only on certain parts there are greenish-yellow to yellowish irregular spots. Sometimes these spots formed irregular stripes (especially along the veins) or rings. The leaves were normal in shape or only a little deformed. The disease symptoms were visible on all leaves, or on the majority of leaves during the growing period.

Mechanical transmission

The mechanical transmissions of the pressed sap from the leaves of *E. europaea* to cucumber (*Cucumis sativus* cv. 'Delicates') and to some other test plants were all negative. We did not obtain either local or systemic infections. After the reinoculation from symptomless cucumbers to healthy cucumbers

we obtained local lesions on inoculated cotyledones after 2—5 days. Later the lesions increased, necrotized and contingently they joined into greater necrosis. After the inoculation of the cucumber crude sap to other species of test plants we obtained positive transmissions and symptoms on the majority of used species. On inoculated leaves small or large local lesions appeared. Deformation of inoculated leaves was rare. The symptoms on non-inoculated leaves were not observed in any single case.

Properties in sap

A crude sap from infected cucumber was used as a virus source, and the infectivity was tested on cucumber.

1. Thermal inactivation-point: all infectivity was lost when the sap was heated for 10 min at 80° C. At the temperature 79° C we obtained some sporadic lesions.
2. Survival in sap at 20—22° C crude sap remained infective for up to 60 days; at 4—6° C up to 200 days' storage and more (the experiment is not finished).
3. In dry leaves from infected cucumber the virus remained infective more than 35—40 days.

Biological properties

Four to five days after the inoculation of cucumber cotyledones the virus was established throughout the whole plant. The greatest virus concentration was found in the cotyledones, then in the stems, in the leaves (in spite of the fact that the leaves were symptomless), and the lowest concentration was in the roots. Later, after the inoculation, the ratio changed and the inoculation with the crude sap of leaves produced more lesions than the inoculation with the sap of cotyledones. The concentration of the virus was tested by the inoculation of the sap from individual parts of infected plants on the cotyledones of the cucumber and by counting the number of lesions after a certain period of time.

The most rapid and intensive development of symptoms was under temperatures above 20° C. Temperatures above 35—45° C and also lower temperatures (10—15° C) reduced the propagation of the virus in the plant and the development of its symptoms.

Aphid transmission

We obtained a positive transmission of the virus from *Euonymus europaea* and cucumber to cucumber by the *Aphis euonymi* F., which has, so far, not been described as a virus vector. The virus was transmitted by aphids collected from a diseased *E. europaea*, and also by aphids from a healthy *E. europaea* fed for two days on a diseased cucumber.

Seed and soil transmission

From the foregoing preliminary results it can be concluded that the virus is transmissible by cucumber seeds and probably by soil.

Discussion

It is not possible to identify the isolated virus from *Euonymus europaea* with *Euonymus* infectious veiriegation virus, the only virus described, so far, on *Euonymus* species. The biological properties of our virus are different from all other viruses in Czechoslovakia. It is probably a new virus transmissible mechanically, by aphids or seeds and it is perhaps also a soilborne virus. The virus has a wide host range. We are continuing our investigations as outlined above and detailed results will be published later.

References

- BAUR, E.: Über eine infektiöse Chlorose von *Euonymus japonicus*. — Ber. dtsch. bot. Ges. **26a** : 711 to 713, 1908.
 BOJŇANSKÝ, V. *et al* : Vírusové choroby rastlín. [The virus diseases of plants.] Bratislava, 468 pp., 1963.
 BRIERLEY, P.: Viruses described primarily on ornamental or miscellaneous plants. — Plant Dis. Repr. Suppl. **150** : 410—482, 1944.

V. BOJŇANSKÝ, V. KOSLJAROVÁ, Ústav experimentálnej fytopatológie a entomológie SAV, Ivanka pri Dunaji: **Mozaika bršlenu**. — Biol. Plant. **10** : 322—324, 1968.

Izoloval sa vírus mozaiky bršlenu z *Euonymus europaea*. Vírus je prenosný mechanicky na uhorky a iné druhy testovacích rastlín, semenom, voškou *Aphis euonymi* F. a snád aj pôdou. Štáva z uhoriek stratila infekčnosť pri 80° C/10 min., po 60 dňoch pri teplote 20—22°C. Pravdepodobne ide o nový dosiaľ nepopísaný vírus.

В. Бойнянский, Вера Кослярова, Институт экспериментальной фитопатологии и энтомологии САН, Иванка при Дунае: **Мозаика бересклета**. — Biol. Plant. **10** : 322—324, 1968.

Был изолирован вирус мозаики бересклета из *Euonymus europaea*. Вирус переносится механически на огурцы и другие виды тестируемых растений, семенами, тлей *Aphis euonymi* Р. и, возможно, даже почвой. Сок из огурцов потерял способность заражать растения после 10 мин. при 80° С а также после выдерживания при 20—22°С в течение 60 дней. Вероятно, что вирус относится к новому до сих пор не описанному виду.

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EONYMUS MOSAIC

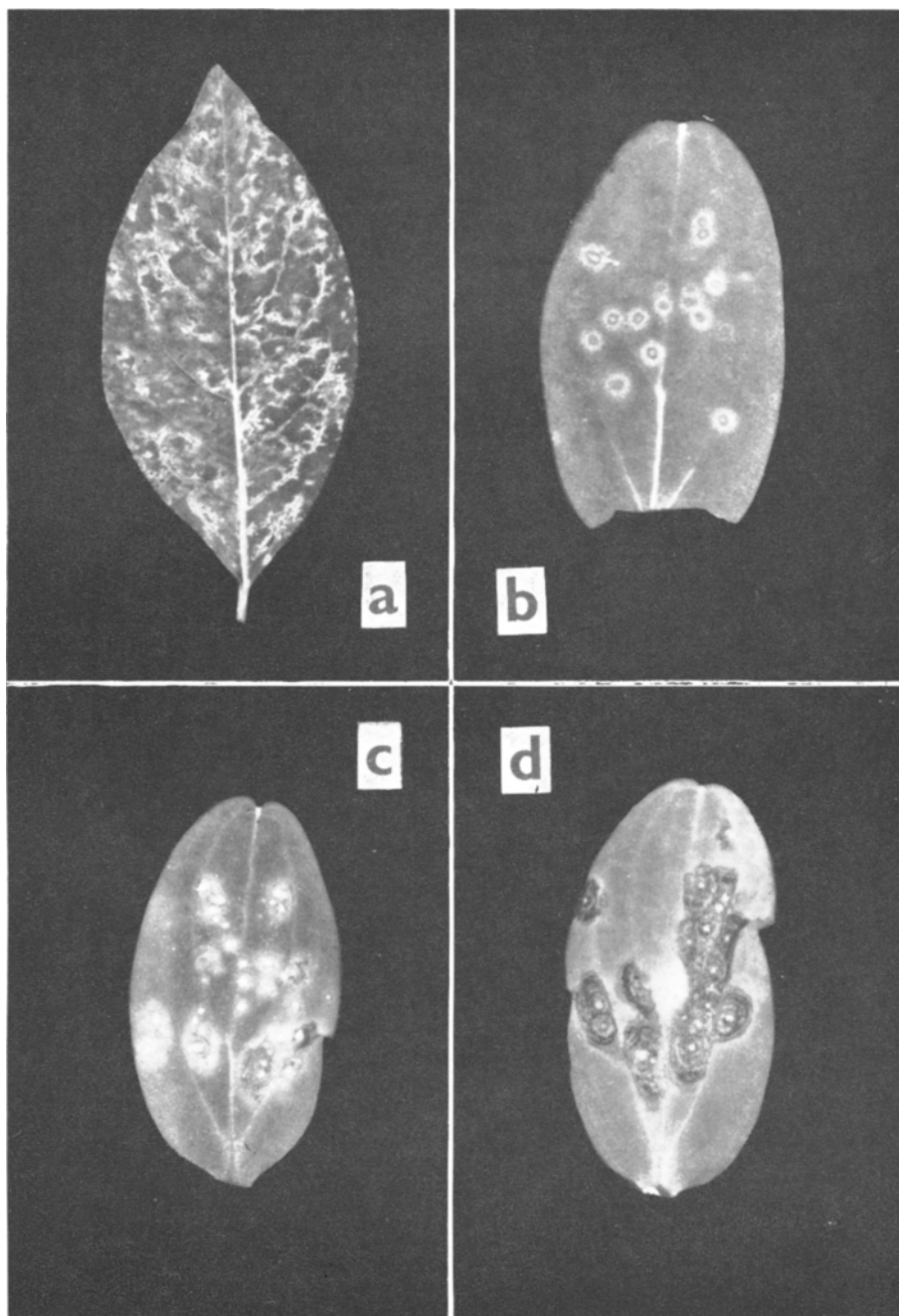


Fig 1 a *Euonymus* mosaic on *E. europaea* L b — d Development of local lesions on cotyledons on *Cucumis sativus* L