BIOLOGIA PLANTARUM (PRAHA)

16 (6) : 476—478, 1974

BRIEF COMMUNICATION

Mycoplasmalike Organisms in *Vaccinium myrtillus* L. Infected with Blueberry Witches Broom

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Received March 27, 1974

Abstract. We confirm Kegler's et al. (1973) finding of MLO in blueberries diseased with witches broom described by Blattný and Starý (1940) as a virus disease. MLO, 150—700 nm in diameter were found sporadically in the etiolated underground parts of the shoots and in the roots, especially in sieve tubes and floem-parenchyma.

Witches broom of blueberry was for the first time described as a virus disease by BLATTNÝ and STARÝ (1940) at the species *Vaccinium myrtillus* L., which is autochtonic in Europe. Similar symptoms were later described by BLATTNÝ sr. at *Vaccinium vitis idae*, *Vaccinium uligonosum* and *Oxiccocus quadripetalus* (personal communication).

The disease was transmitted by tissue implantation (BLATTNÝ, STARÝ 1940), by grafting (BOS 1960, USCHDRAWEIT 1961), by grafting on the bottle (BLATTNÝ sr., not published) and the leafhopper *Idiodonus cruentatus* PANZ was able to transmit it too (BLATTNÝ jr. 1963—1964).

Similar symptoms, especially stunting is typical for blueberry stunt described from the USA where was found or transmitted to more species of *Vaccinium*. This blueberry stunt was transmitted by grafting, KUNKEL (TOMLINSON *et al.* 1950) transmitted it by dodder to *Vinca rosea*. As a vector was proved *Scaphytopius magdalensis* PROV. (TOMLINSON *et al.* 1950). According to the symptoms — stunt, small leaves, unfruitfulness, witches broom and according to the easy transmission both diseases were put to the group of yellow-type virus diseases. However the virions were not found, although the American blueberry stunt especially was investigated very thoroughly, similarly as false blossom of cranberry. There in the USA CHEN (1970) found the mycoplasmalike organisms in blueberreies infected with blueberry stunt and in cranberries infected with false blossom. The bodies

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ranged in diameter from 160—700 nm for blueberry stunt and 80—300 nm for cranberry false blossom.

KEGLER *et al.* (1973) found mycoplasmalike organisms at blueberry witches broom in German Democratic Republic. In our experiment blueberry infected with witches broom were collected in the middle of November, while in the winter period is usually the concentration of mycoplasmalike organisms in underground parts higher than in the vegetation period. The infested plants originated from the same place as plants used formerly BLATTNÝ jr. (1963) for transmission experiments with the leafhoppers. The underground etiolated shoots of very severely infested plants and also the thin one year old roots were used for the experiments. The control plants originated from a mountains region, from the places where the blueberry witches broom has not yet been found. Both, the shoots and the roots were cut with a scalpel into cca 1 mm long parts. The samples were then transferred immediately to 6% glutaraldehyde purified by vacuum distillation (FAHIMI et DROCHMANS 1965), buffered at pH 7.2—7.4 in 0.1 M phosphate buffer and fixed overnight (at least 20 h). The pieces were washed in 4 changes of phosphate buffer with 0.2 M sucrose over 2 h period (last change overnight) before being postfixed in 2% osmium tetroxide in the same buffer for 2 h. Fixation and post-fixation were made at 4 °C. The tissue was then dehydrated in acetone (80% acetone saturated with uranyl acetate) and embedded in Durcupan. Sections were cut on Tesla BS 480 microtome using glass knives; picked up on Formvar coated grids and stained with lead citrate (REYNOLDS 1963). Stained sections were examined using Tesla BS 613 electron microscope at 80 kV. We observed mycoplasmalike organisms in phloem (sieve tubes, phloem parenchyma) of young shoots and roots. The mycoplasmalike organisms are oval or elongated, 150—700 nm in diameter and have poorly defined membrane with some amorphous material attached on. In the electron dense ground substance there are ribosomes and sometimes one or two nucleus-like zones. There in the organisms with two nucleuslike zones we observed between these zones ground substance of lower density with more ribosomes (Fig. 3). Although the mycoplasmalike organisms found at the American blueberry stunt and at the European blueberry witches broom are nearly the same in the shape and in the magnitude — KEGLER (1973) suggested that it is the same disease — the other precise prove about their identity has not yet been given.

Acknowledgment

We thank Dr. T. Kalina of the Department of Botany, Charles University, Prague for the permission to work on their electronmicroscop T BS 613 and Mrs. Chmelařová for the technical colaboration.

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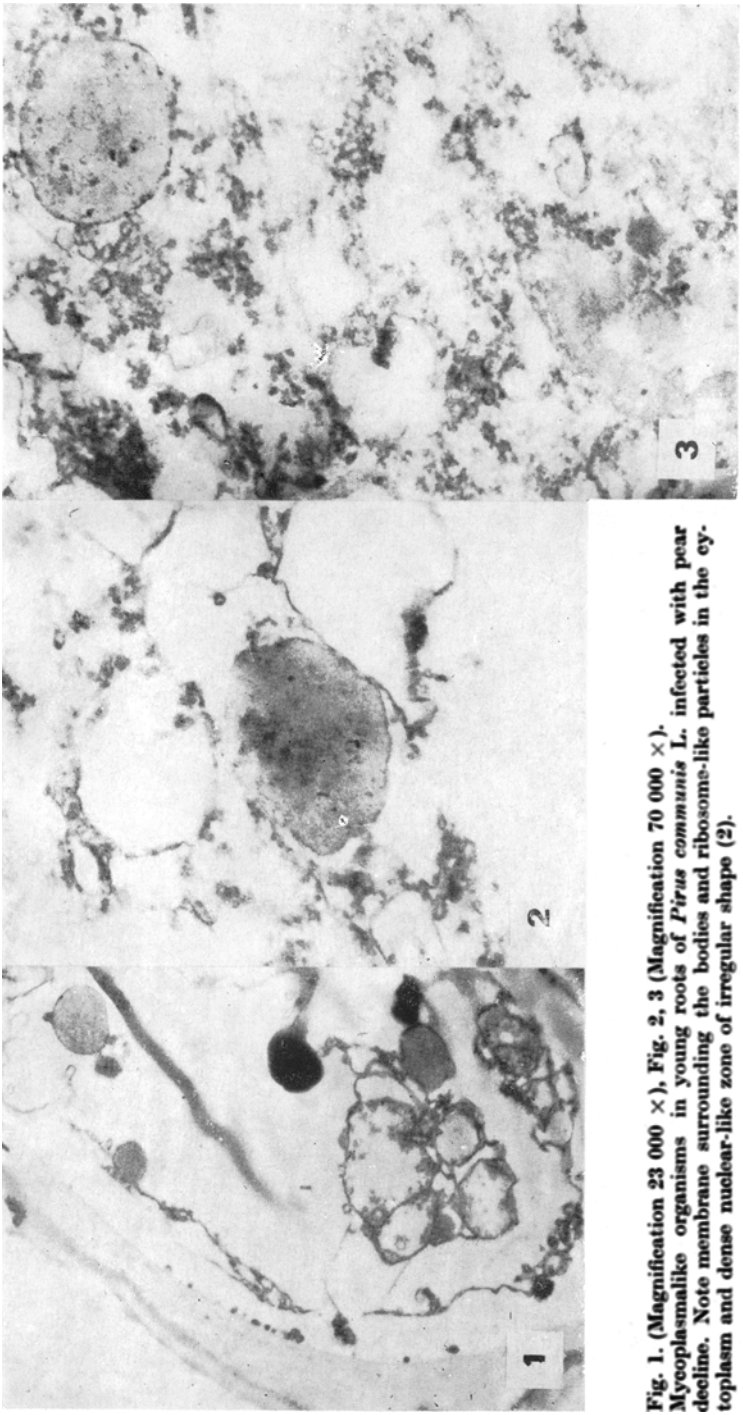

Fig. 1. (Magnification 23 000 ×), Fig. 2, 3 (Magnification 70 000 ×). Mycoplasmalike organisms in young roots of *Pirus communis* L. infected with pear decline. Note membrane surrounding the bodies and ribosome-like particles in the cytoplasm and dense nuclear-like zone of irregular shape (2).

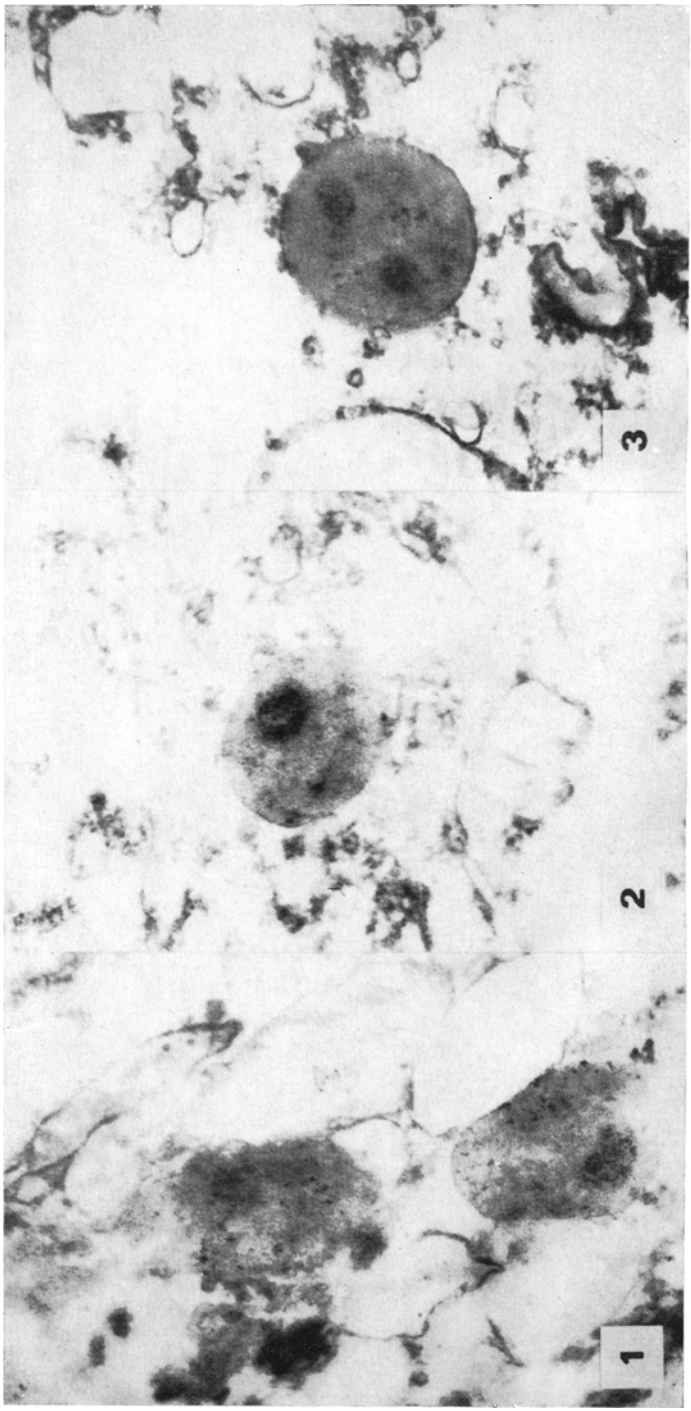

Fig. 1, 2, 3. Mycoplasmalike organisms in young shoots of *Vaccinium myrtillus* L. infected with witches broom (Magnification approx. 70 000×).