

BRIEF COMMUNICATION

Tubular Structures Associated with Mycoplasma in Proliferation Infected Apple Trees

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Abstract. Tubular structures showing honeycomb-like appearance in cross sections were found in mycoplasma invaded sievetube cells of abnormal sprouts of apple trees infected with the proliferation disease. The nature of tubular structures is unknown. There is a striking similarity (or identity) with the tubular structures described formerly in HEp-2 cells which were established from human carcinoma of the larynx.

Investigating vascular elements, esp. sieve-tubes of abnormal sprouts growing from roots of apple trees infected with the proliferation disease and looking for the mycoplasma agent of this disease we have observed in ultrathin sections some peculiarities not found in healthy apple trees. In our previous paper *e.g.* membranous structures were mentioned. However, tubular structures observed in some sections and described here were the most interesting. (Material and methods used were already presented by BRČÁK *et al.* 1972.)

Some cells in which individual mycoplasma bodies were observed contained at random regular osmiophilic tubular structures showing crystalline-like arrangement (Figs. 1, 2). Cross-sectioned fascicles of these tubular structures remembered of a honeycomb-like appearance (Fig. 2); in longitudinal sections the tubular structures were slightly curved, however, they did not allow to estimate an approximate length. The thickness of electron-dense rings was about 12 nm; the centre to centre distance was approximately 54 nm.

To date, no similar tubular structures have been described in plant cells. However, some papers dealing with morphologically identical structures in human cells were published. TANI and HANDA (1966) found them in a human oligodendroglioma — according to CLARKE *et al.* (1969) who noted these structures in HEp-2 cells (which were established from a human carcinoma

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of the larynx) infected with a type I foamy agent. Recently, BERTHIAUME and JONCAS (1973) observed almost identical tubular structures both in HEp-2 cells infected with respiratory syncytial virus and in uninfected (control) HEp-2 cells. These tubular structures showed also a honeycomb appearance with electron dense rings 8 nm in thickness, they were closely packed together with a centre to centre distance measuring approximately 22 nm; they were entangled in a haphazard way in the cytoplasm, usually in the vicinity of the nucleus. BERTHIAUME and JONCAS (1973) do not exclude their virus origin.

The tubular structures found in mycoplasma infected cells of apple trees show identical shape, like in HEp-2 cells, however their size seems to be larger. Our electron micrographs do not allow to presume any connection with any plant cells organelles; their connection with mycoplasmas could not be proved as well. Therefore the nature of tubular structures found remains unknown.

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BOOK REVIEWS

JOHN, B., LEWIS, K. R.: **The meiotic mechanisms.** — Oxford Biology Readers. Vol. 65, Oxford University Press, London 1973. 32 pp. 60 p.

Authors of this booklet succeeded to make the most complex cytogenetic picture of the meiotic events. The booklet contains 39 microphotographs, 19 illustrations and 5 tables. It deals with the role of meiosis in the life cycle of different taxons, cytogenetic characteristics of the meiotic process, genetic consequences of meiosis and genetic control of the meiotic process. The booklet includes also detailed survey of contemporary hypotheses concerning the molecular mechanisms of chromosome pairing, synaptonemal complexes and crossing over. In the whole, it is the best contemporary review of the meiotic process. Complicated things are explained in a simple, understandable form and the text is supported by clear-cut illustrations. It is very useful booklet for all genetists and cytologists.

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TUBULAR STRUCTURES

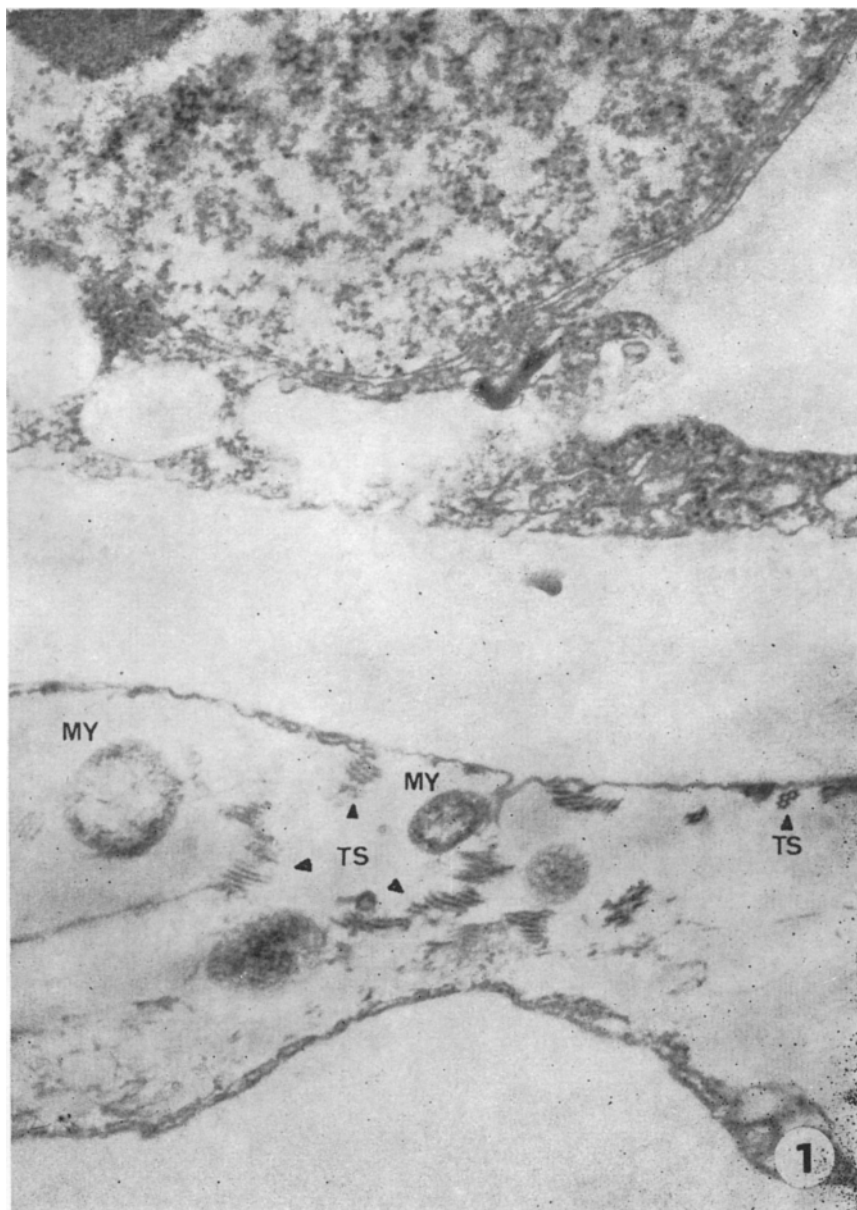


Fig. 1. Electron micrograph of an ultrathin section of a phloem cell from abnormal underground sprout growing from roots of a proliferation infected apple tree containing mycoplasmas (MY) and tubular structures (TS).

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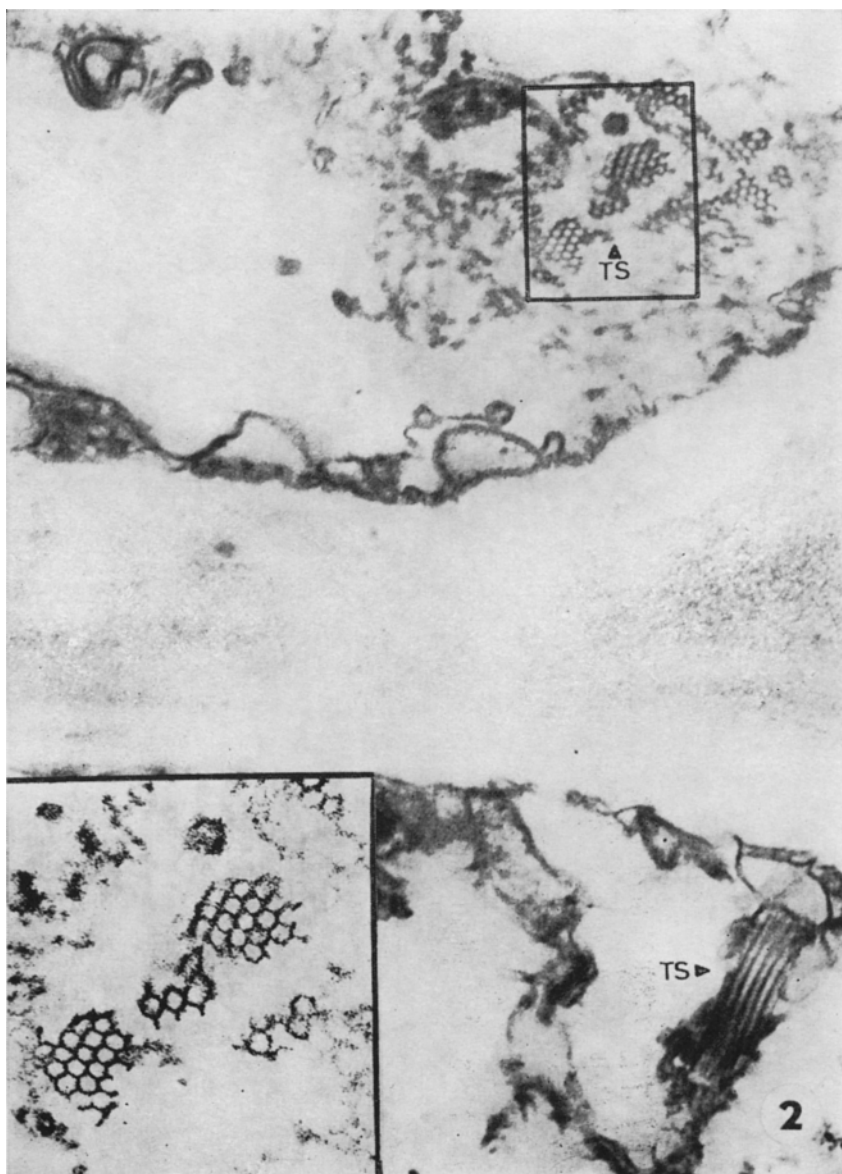


Fig. 2. Tubular structures (TS) in a proliferation infected abnormal sprout of an apple tree; cross-sectioned (with a detail left below) and longitudinally sectioned (right below).