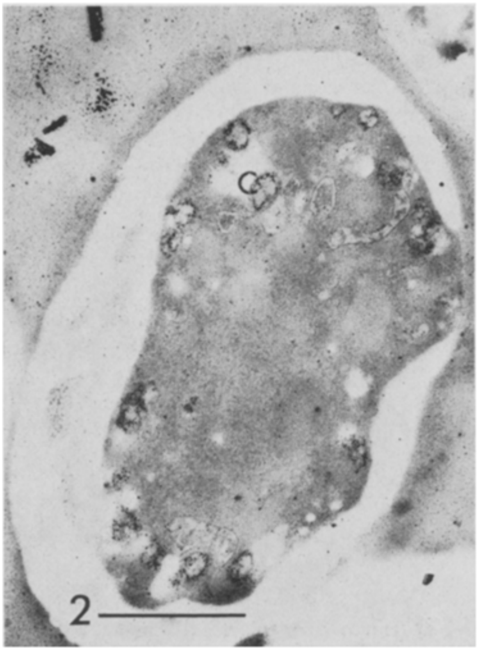

Fig. 2. Salmon red cell stained with periodic acid, buffered hexamine and silver nitrate showing: C, silver grains deposited on cytosome. Scale 1 µm.

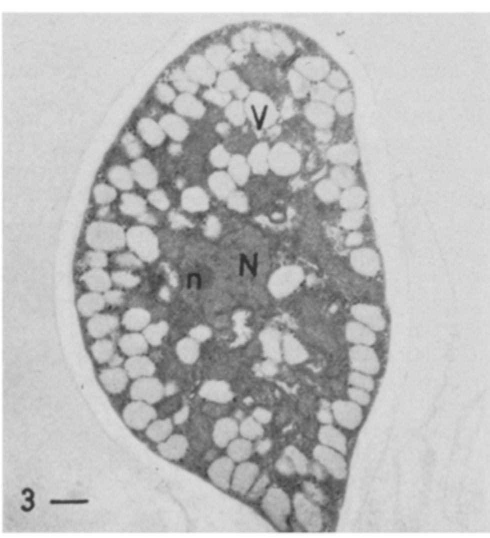

Fig. 3. Highly vacuolated creamy white cell showing constricted nucleus (N), nucleolus (n) and vacuoles (V) without cytosome. Scale 1 µm.

nible only in the red strain but not in the white one (Figure 3). The deposition of the silver grains on them (cytosomes) suggested their chemical nature as polysaccharide (Figure 2).

Evidence of cytosomes in *T. maculans* distinguishes it from the yeasts in its phylogenetic relationship, although species of the genus *Taphrina* were once considered very close to yeasts owing to the morphological conformity of the cultures[3,4]. The present organelle differs from the lysosomes in chemical nature and morphology. It also differs considerably from the peroxisomes reported earlier to occur in animal, plant and yeast cells, which possess high amounts of several enzymes and different morphology[5]. Gamma-particles in the zoospores of *Blastocladiella* appear to have a different function and morphology from the present cytosome[6]. Also vesicles of the hyphae reported by GROVE et al.[7] in *Pythium ultimum* can be differentiated on the basis of the fact that spores of *T. maculans* possess distinct vacuoles besides cytosomes. Hence, the present report presents preliminary evidence for the occurrence of a new organelle in the fungal cell[8,5]. The possible function and mode of cytosome formation can to some extent be speculated on the basis of our later work where massive intracellular synthesis of the cell wall during senescence might be triggered by the cytosomes[9].

Zusammenfassung. Elektronenoptische Beschreibung von «Cytosomen» in den Zellen vom Typus rot im Pilz *Taphrina maculans* Butler.

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Effect of Citrus Brown Mite, *Eutetranychus orientalis* (Acarina: Tetranychidae), Infestation on the N, P, K and Pigments of Sour Orange Leaves

Studies on the relationship between phytophagous mites and their host plants have been confined to the effect of nutrient elements on the development of mites[1–3]. It was concluded that mite populations were influenced by plant nutrition. However, few observations were reported on the effect of mite infestation on the chemical constituents of the host plant. For instance, it was reported[4] that the N, P and K of apple foliage were reduced as a result of high infestation by European red mite, *Panonychus ulmi* (Koch). *Tetranychus urticae* (Koch) infestation decreased assimilation and changed

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chlorophyll to phäophytine[5]. A reduction in amylase, proteolytic enzyme activity, total protein and accumulation of nitrogenous substances were noted in the stem of cotton plants infested with *T. urticae*[6].

The present study reports some data on the effect of the citrus brown mite, *Eutetranychus orientalis* (Klein) infestation on nitrogen, phosphorus, potassium, chlorophyll and carotenoids contents of sour orange leaves.

Methods. Artificial infestation with the citrus brown mite was performed at rates of 5, 10, 20 adult females per leaf in 3 groups of one year old sour orange seedlings *Citrus aurantium*. Each group consisted of 5 seedlings. A fourth group of equal number was left free of infestation as control. The infested seedlings were left for about 6 weeks until discoloration of the leaf surface as a result of mite infestation was clearly visible. The leaves were then detached and brushed from mites. The detached leaves were dried and analyzed for N, P and K. Phosphorus and nitrogen were determined colorimetrically. Potassium was estimated by using a spectrophotometer. The leaf pigments chlorophyll, a and b, and carotenoids were determined colorimetrically using fresh samples.

Results and discussion. Leaves of sour orange seedlings initially infested with 20 females per leaf were intensively yellowed, those infested with 10 females per leaf were moderately yellowed, while the discoloration was slight on the leaves of seedlings infested with 5 females per leaf. When the percentages of the nitrogen, phosphorus and potassium contents of the infested leaves were compared with those of the control on a dry weight basis, it appeared that the concentrations of these elements decreased in the infested seedlings. Moreover, the N, P and K contents correlated negatively with the mite populations.

As to the leaf pigments, it was found that the mite infestation reduced the percentage of chlorophyll a and b, and this reduction coincided with an increase in carotenoids contents. The lower contents of chlorophyll corresponded to the higher level of the citrus brown mite infestation, while the lower contents of carotenoids corresponded to the light infestation. These results generally indicated a negative correlation between the citrus brown mite infestation and the levels, of N, P, K and chlorophyll, while carotenoids and dry weight correlated positively.

The data may suggest that *E. orientalis* infestation affects the chemical constituents of sour orange leaves and consequently high mite population can cause a reduction in the essential nutrients and chlorophyll. The present study may further suggest that if a better understanding of the food requirements of the phytophagous mites could be achieved, this might help to overcome defficiency of plant nutrients resulting from mite infestation with a certain fertilization programming for the host plant.

Zusammenfassung. Es wurde der Einfluss einer Infestation mit *Eutetranychus orientalis* (Klein) auf die chemische Zusammensetzung von Sauerapfelsinen-Blättern untersucht, wobei eine negative Korrelation zwischen Spinnmilbenzahl und den Konzentrationen von N, P, K und Chlorophyll gefunden wurde.

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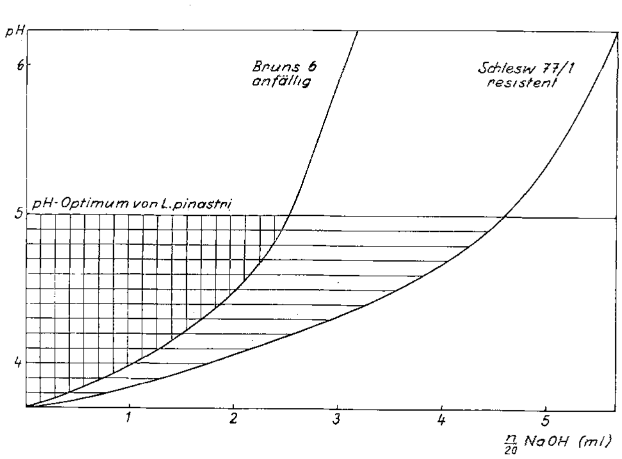
Zur pH-Regulation im Verlauf von Wirt-Parasit-Interaktionen bei *Pinus sylvestris/Lophodermium pinastri*

Zahlreiche Pflanzenarten sind in der Lage, die Wasserstoffionenkonzentration sowohl des intrazellulären als auch des extrazellulären Milieus zu regulieren[1]. Bei einer Pilzinfektion ist das intrazelluläre Milieu der Wirtspflanze zugleich das extrazelluläre Milieu des Parasiten. Daher ist mit einer Konkurrenz der beiden pH-Regulationsmechanismen zu rechnen, wenn das pH-Optimum des Cytoplasmas der Wirtspflanze und das pH-Optimum für das Wachstum des Erregers verschieden sind. In der Regel kann davon ausgegangen werden, dass der pH-Wert des Cytoplasmas der Wirtspflanze unter dem für das Wachstum der meisten pathogenen Pilze optimalen Wert liegt. Dass dieser pH-Unterschied jedoch nicht der entscheidende präformierte Faktor einer Ausbreitungsresistenz ist, konnte verschiedentlich gezeigt werden. Eine Korrelation zwischen Resistenz und Azidität des Zellsaftes liess sich bisher nur für wenige Beispiele nachweisen[2].



Pufferkapazität in Nadelhomogenisaten von befallsfreien Kiefern-Klonen mit unterschiedlicher Resistenz gegen *Lophodermium pinastri*.

Daher wurde an der durch *Lophodermium pinastri* hervorgerufenen Nadelschüttekrankheit der Kiefer (*Pinus sylvestris*) untersucht, ob eine pH-Regulation für die Ausbreitungsresistenz von Bedeutung ist. *L. pinastri* hat ein Wachstumsoptimum bei pH 5[3], die pH-Werte von Nadelhomogenisat liegen bis zu 2 pH-Einheiten darunter. Es war zu prüfen, ob der Pilz sein pH-Milieu in Richtung seines Wachstumsoptimums regulieren kann und ob dieser Regulation in resistenten Kiefern ein grösserer Widerstand entgegenwirkt als in anfälligen[4,5]. Daher wurde der Pilz

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