

Cytologie II.



Buněčné inkluze, chromoplasty

begónie (kysala) královská (*Begonia rex*)

č. *Begoniaceae* - kysalovité

- příčný řez řapíkem listu; **drůzy** - složené krystaly štavelanu vápenatého víceméně kulovitého tvaru, z jejichž povrchu vyčnívají jednotlivé krystaly





Begonia rex, obj. 40×



Begonia rex, obj. 40 \times

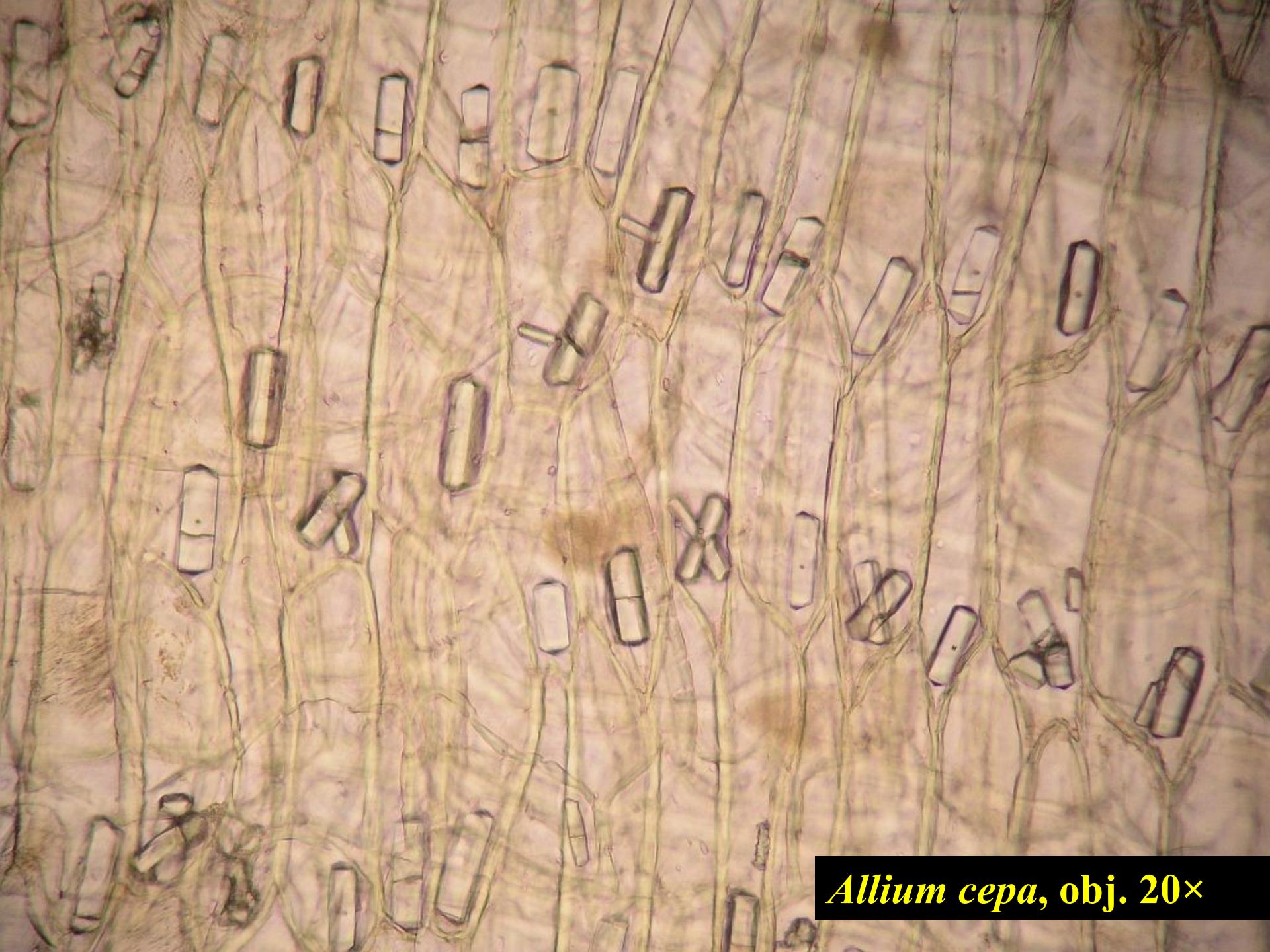
A detailed micrograph showing the surface of a Begonia rex leaf. The image highlights several large, polygonal epidermal cells. In the center, a cluster of small, rounded trichomes is visible, some appearing as individual structures and others as small groups. The overall texture is slightly irregular and organic.

Begonia rex, obj. 40×

česnek cibule (*Allium cepa*)

č. *Alliaceae* - česnekovité

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- epidermis ze zevní strany vnějších vrstev suknic cibule
 - několik dní v 70% et-OH; **styloidy**; št'avelan vápenatý

A micrograph showing a dense arrangement of plant cells, likely from a root tip of Allium cepa. The cells are elongated and oriented vertically. Many of the cells contain large, dark, irregularly shaped bodies, which are characteristic of mitotic figures or chromosomes. Some of these figures are clearly visible, appearing as dark, dense clusters within the cytoplasm. The overall texture is somewhat grainy, typical of a photomicrograph.

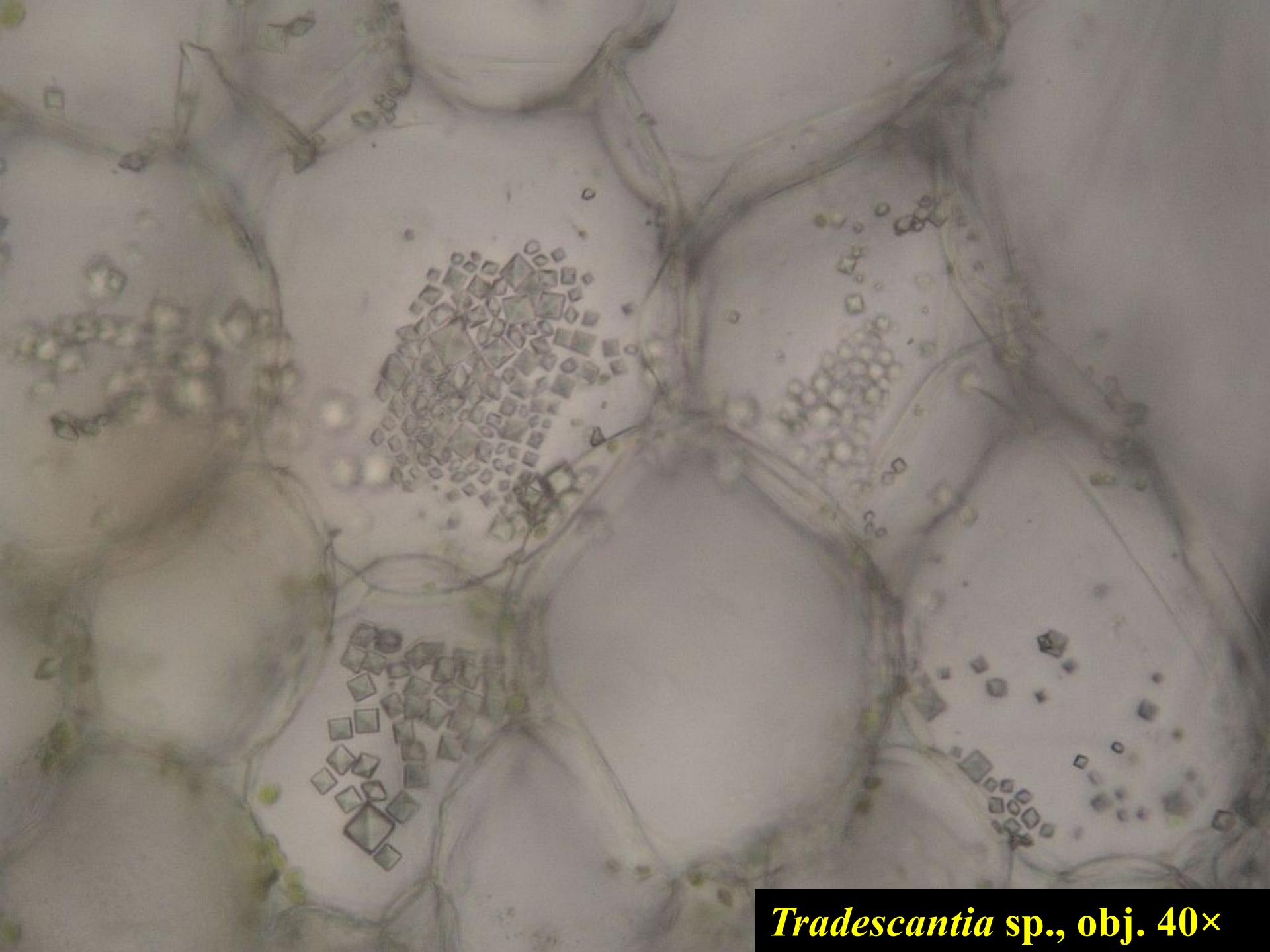
Allium cepa, obj. 20×

tradeskancie (voděnka, podénka, „blázen“) (*Tradescantia* sp.)

č. Commelinaceae - křížatkovité

- příčný řez stonkem
- šťavelan vápenatý; rafidy





Tradescantia sp., obj. 40×

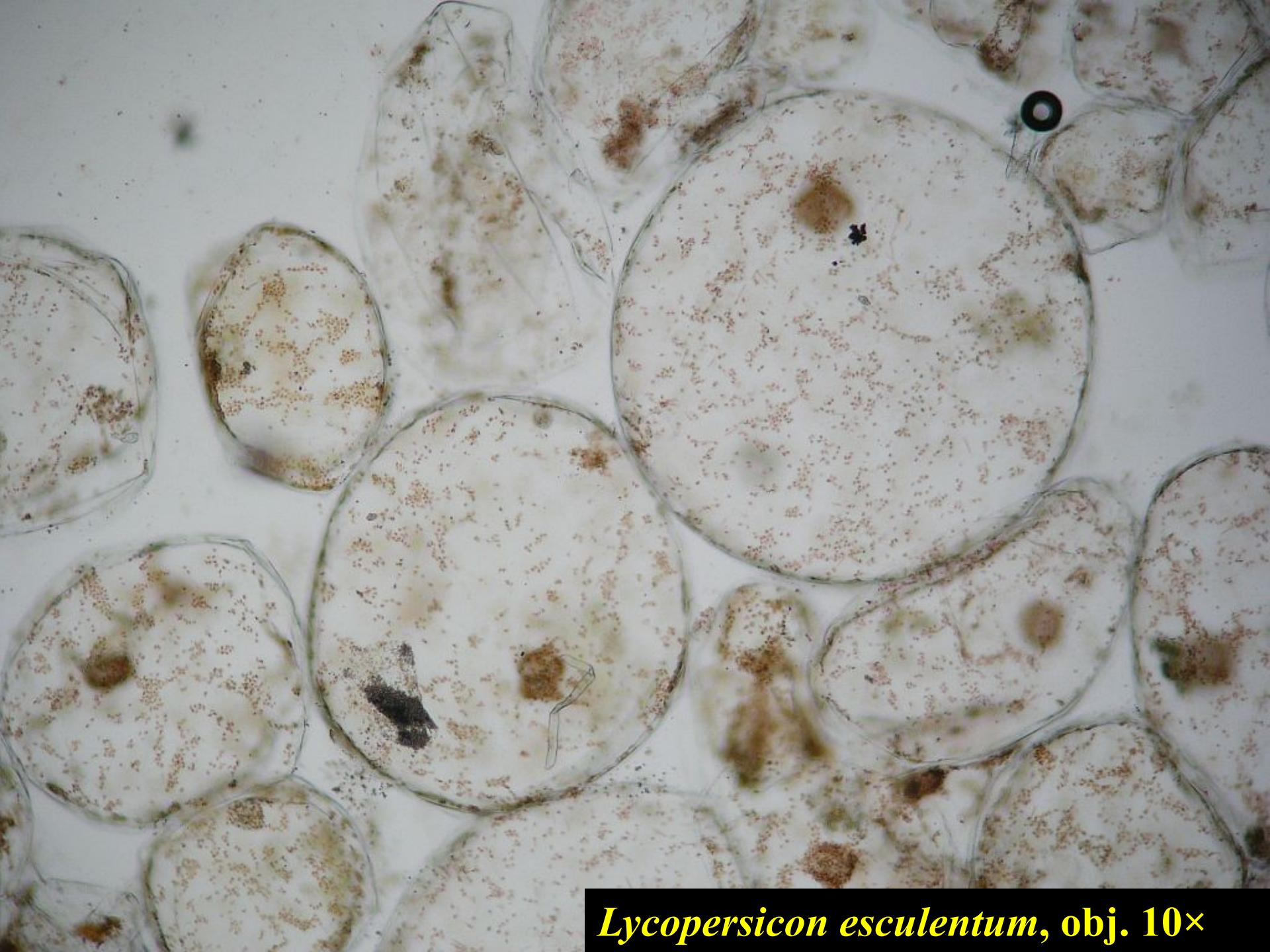


Tradescantia sp., obj. 40 \times

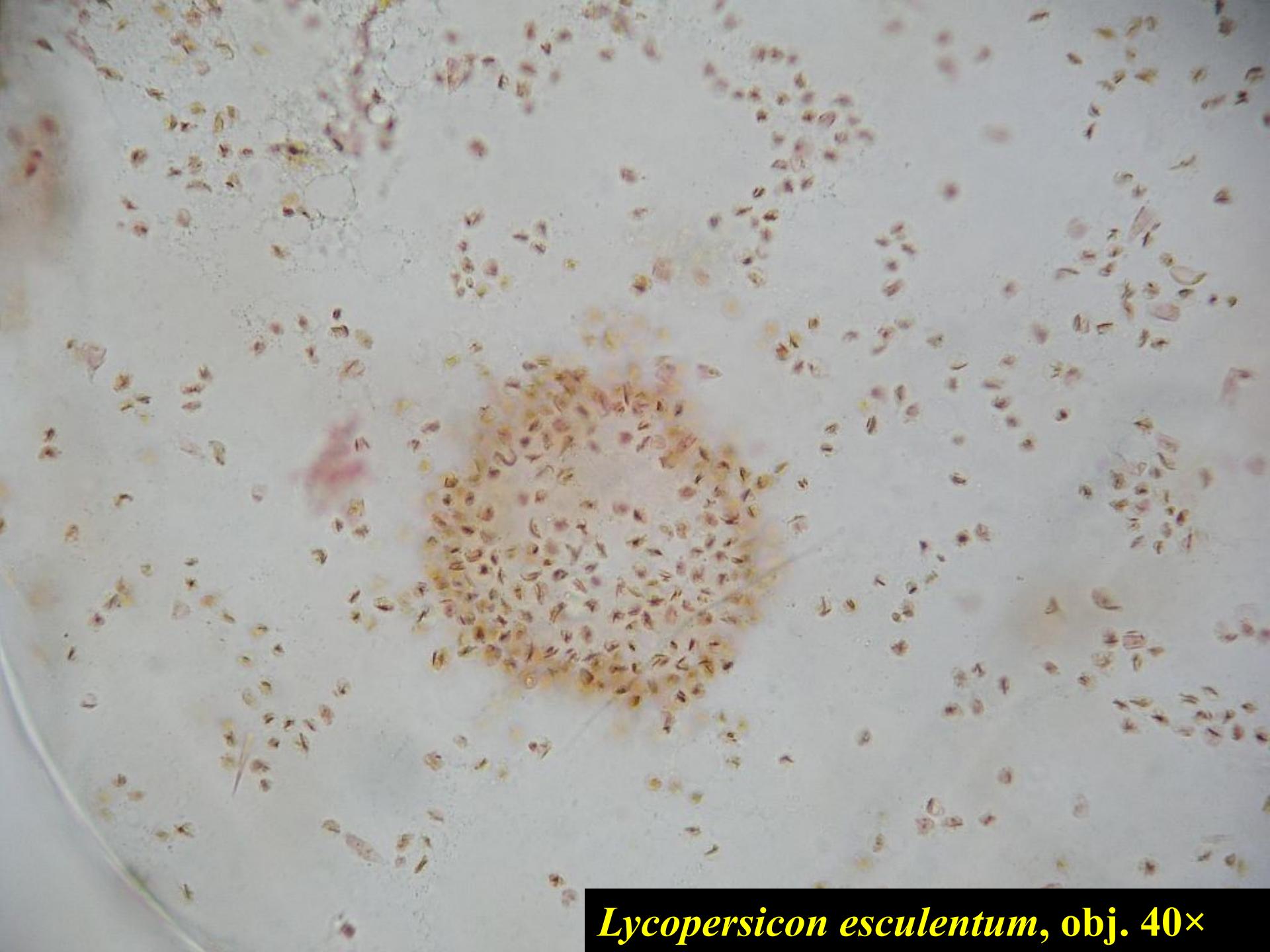
lilek rajče (*Lycopersicon esculentum*, syn. *Solanum lycopersicum*) č. *Solanaceae* - lilkovité

- chromoplasty v subepidermálních parenchymatických buňkách plodu lilku rajčete





Lycopersicon esculentum, obj. 10×



Lycopersicon esculentum, obj. 40×

růže šípková (*Rosa canina*)

č. *Rosaceae* - růžovité

- chromoplasty v subepidermálních parenchymatických buňkách plodu růže šípkové; drůzy



A detailed micrograph showing several pollen grains of Rosa canina. The pollen grains are large, roughly spherical, and feature a prominent apertural area at the top where a dark, circular pore plate is visible. The surface of the pollen grains is covered with numerous small, yellowish-orange granules. The background is a light, translucent color, suggesting a thin-section preparation.

Rosa canina, obj. 40×



Rosa canina, obj. 40×

Seznam použitých rostlinných druhů

- begónie (kysala) královská (*Begonia rex*) – příčný řez řapíkem listu – drůzy
- česnek cibule (*Allium cepa*) – suchá zevní epidermis suknice cibule - styloidy
- voděnka (*Tradescantia* sp.) – příčný řez stonkem – rafidy (event. krystalický písek)
- lilek rajče (*Lycopersicon esculentum*) – subepidermální parenchymatické buňky oplodí – chromoplasty
- růže šípková (*Rosa canina*) – subepidermální parenchymatické buňky oplodí – vretenovité chromoplasty, drůzy
- paprika setá (*Capsicum annuum*) - subepidermální parenchymatické buňky oplodí – chromoplasty

Crystals have been found widely in both the plant and animal kingdoms as far back as the seventeenth century by the pioneers of light microscopy. Although crystal formation in plants occurs in virtually all tissues, its highest concentration may be found within internal leaf idioblasts and external trichome cells ([Arnott & Pautard 1970](#), [Franceschi & Horner 1980](#)). Crystal concentration can vary considerably between species, occasionally reaching a truly enormous mass: for example, *Cactus senilis* has been found to have a dry weight mass of 85% crystalline calcium oxalate ([Cheavin 1938](#)).

Crystal composition is predominantly calcium oxalate (CaOx) but can occur as at least nine other salts. Despite a unique chemical composition, CaOx appears in several shapes (habits) such as: raphide needles, actinic druses, prisms, rhomboids and styloid columns ([Arnott & Pautard 1970](#)). Although the precise function of crystal formation is unclear, much attention has been focused on its role as a noxious anti-foraging device. In addition to making the host plant inedible to predators, crystals may also act as a detoxification mechanism by rendering excess reactive metabolites inert. Others have proposed roles for crystals as either simple unavoidable metabolic by-products or elegant cell regulators of osmotically active ions needed to maintain cell homeostasis ([Rasmussen & Smith 1961](#), [Raven & Smith 1976](#)). They may also have a role in essential nitrogen metabolism. Finally, it is possible that crystals may serve as a passive structural support for non-lignified tissue ([Franceschi & Horner 1980](#)).

A widely accepted function of crystal formation is as an anti-herbivory defense ([Pohl 1965](#), [Ward et al. 1997](#)). This study describes patterns of CaOx crystal accumulation and compares that to a recognized major leaf defense - toughness. Leaf crystal amount and toughness of two age classes in five tropical plants were quantified and correlated.