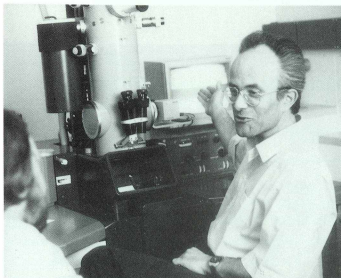


# Ultrastructure Research and Electron Microscopy

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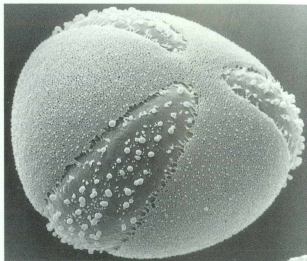
## Research

Work in this department is directed towards the following main goals.

1. One of these is to obtain "life-like" structures by *optimizing conventional and advanced preparation techniques in TEM and SEM*, not only to strictly avoid "artifacts" but also to improve structure preservation greatly. The optimal preservation of structure is especially important for the adequate representation of organelles / structures in metabolically highly active cells (seen in TEM) and for plant material with fragile, collapsable cell walls (seen in SEM). "Life-like" structures are one of the bases of studies described in paragraphs 2-4.
2. Sexual reproduction in Spermatophyta requires the coordinated development of both the male and female reproductive organs (anther and pistil), which both show highly distinct struc-

tures and developmental pathways. An understanding of sexual plant reproduction to a large extent depends on the intimate knowledge of ultrastructural details. Therefore studies on *reproductive biology/plant embryology* mostly deal with aspects of gametophyte development (male: microsporogenesis, pollen, pollen tube...; female: megasporogenesis, stigma, stylus, embryo sac...) and pollination biology. Our working-group is going to cover nearly all of these topics.

3. *Palynology* is one of the most "applicable" branches, both in pure and applied fields of natural sciences. Our studies focus on the documentation of pollen morphology in critical angiosperm taxa (at the genus or family level, recently e.g. Gesneriaceae, Bromeliaceae, or *Limnanthes*) and on the screening of their functional and/or systematic relevance.



**Fig. 1.** *Convolvulus tricolor*. Tricolpate pollen grain

4. *Phytopathological research* focuses on morphological, histological and cytological interactions between hosts and parasites (e.g. mildew on *Vitis vinifera*, or MLOs on *Quercus* or *Malus*).

## Teaching

Electron microscopy of the plant cell I and II (L + P)

Preparation techniques in the transmission electron microscopy (L + P)

Microsporo- and gametogenesis (L + P)

Plant galls - their diversity and ecology (L + P)

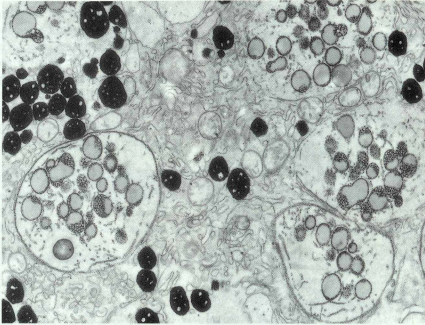


Fig. 2. Tapetum cell (detail) of *Tilia platyphyllos*

## International Cooperations

Dr. José Ubera, University of Córdoba, Spain:  
Estudio comparativo de la microsporogénesis en líneas fértiles y estériles de *Rosmarinus officinalis* L. (Lamiaceae).

Project with the University of Barcelona, Spain:  
Study of the pollenkit in anemophilous and entomophilous pollen grains: allergenic potential and role in pollination.

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## Selected References

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