Palynomorphs

- Palynologists study microscopic bodies known as palynomorphs which include an array of organic entities consisting of highly resistant wall component.
- Eg. Fungal spores, algal spores, spores,dinoflagellates and pollen grains of land plants.

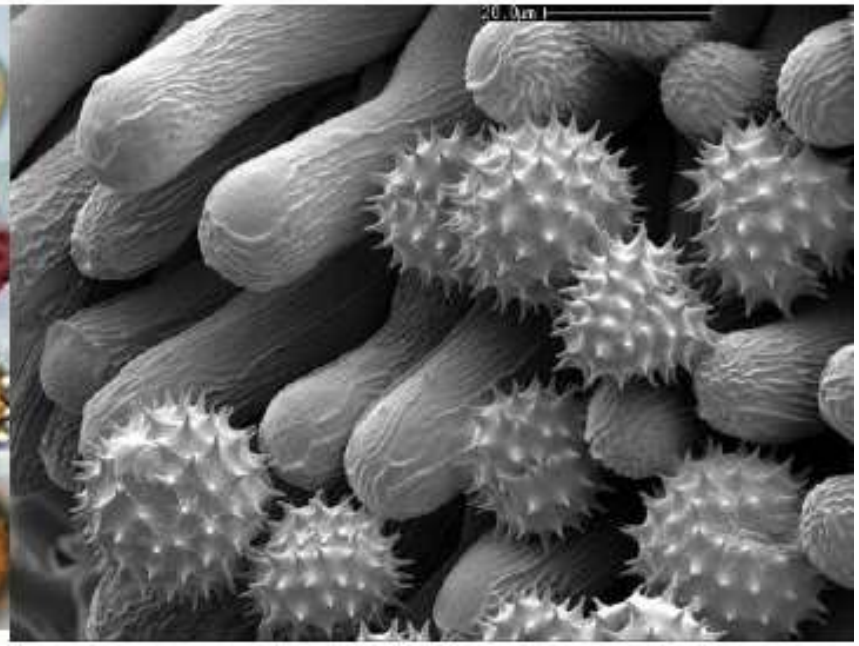
- Palynology is the study of fossil and modern ‘palynomorphs’
- A palynomorph is defined as a particle made of organic material that measures between 5 and 500 micrometers and is found in sedimentary deposits

- Spores are reproductive haploid structures and can be large female spores called megaspores and small male spores called microspores(pollens).
- So, all pollens are spores but not all spores are pollens.

Daisy Pollen under Light Microscope and SEM

Light Microscope

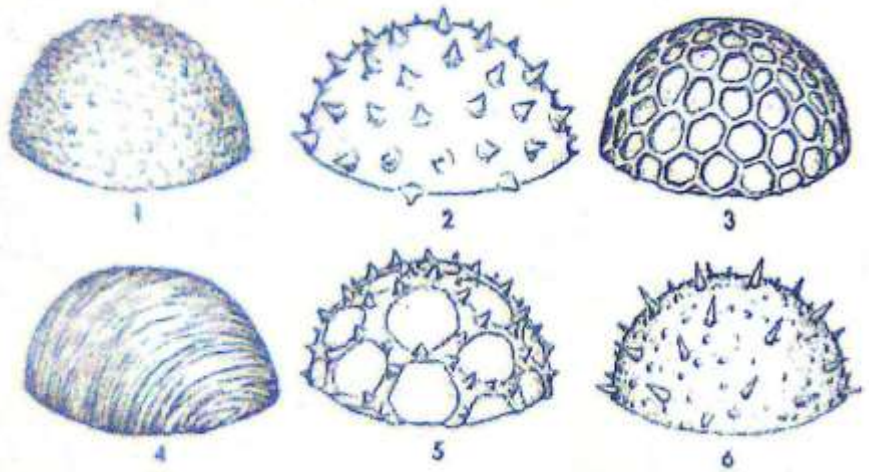
Scanning Electron Microscope



Light: http://www.abc.net.au/reslib/201110/r841964_7864873.jpg
SEM: http://www.abc.net.au/reslib/201110/r842009_7866030.JPG

Sporopollenin

- It was first observed and named as sporonin by John(1814) and characterized by Berzelino(1830).
- It remains unaffected by enzymes so the exines in pollens and spores remain unaffected while passing through the guts of animals and humans but the contents of the grains are digested. The resistant sporopollenin gives the sporomorph(a fossil dispersed pollen or spore) extreme durability.
- The formula varies from $C_{90}H_{134}O_{30}$ to $C_{90}H_{142}O_{35}$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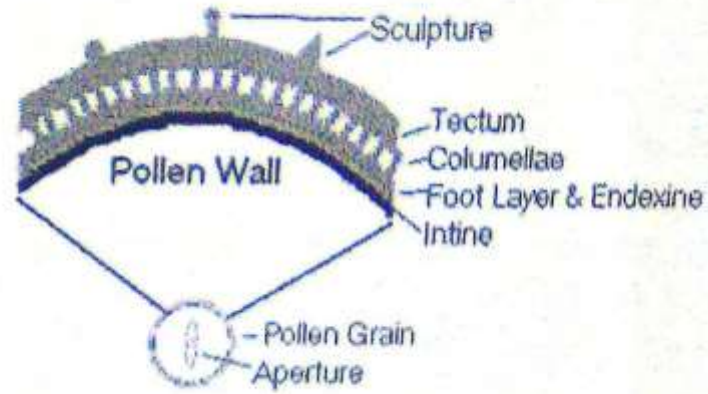
Sculpture
Tectum
Columellae
Foot Layer & Endexine
Intine
Pollen Wall
Pollen Grain
Aperture

Chemical Nature of Sporopollenin

- It is a tough , inert , organic compound, colourless to yellow or amber colured depending on the length of treatment(acetolysis) and thickness of exine.
- It is a high mol. wt. Polymer of C,H and O and carotenoid like substance(polymer of beta carotene, xanthophyll and fatty acids). Acc. to some it is a condensed carbohydrate.

FUNCTION

- The oldest sporopollenin acritarchs occur in PreCambrian rocks(1.2-1.4) billion yrs old. Its presence has important implications for investigations into origin of life.
- It is evident that the pollen exine has a basic function in the physiological complex of fertilization since it has developed in almost all terrestrial plants.
- The resistant character of sporopollenin to decay, oxidation is directly related to its amount and distribution. Its higher conc. and greater deposition in outer part of the pollen wall(ektexine/ sexine) make the exine more durable, thus extends its viability.
- Assemblage of varied palynomorphs by virtue of the sporopollenin help in reconstruction of past vegetation, predicting climatic changes, understanding the evolution of plant life and in exploration of hydrocarbons(petroleum and coal)

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