Subject – Gymnosperms

Topic – Glossopteridales

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Glossopteridales

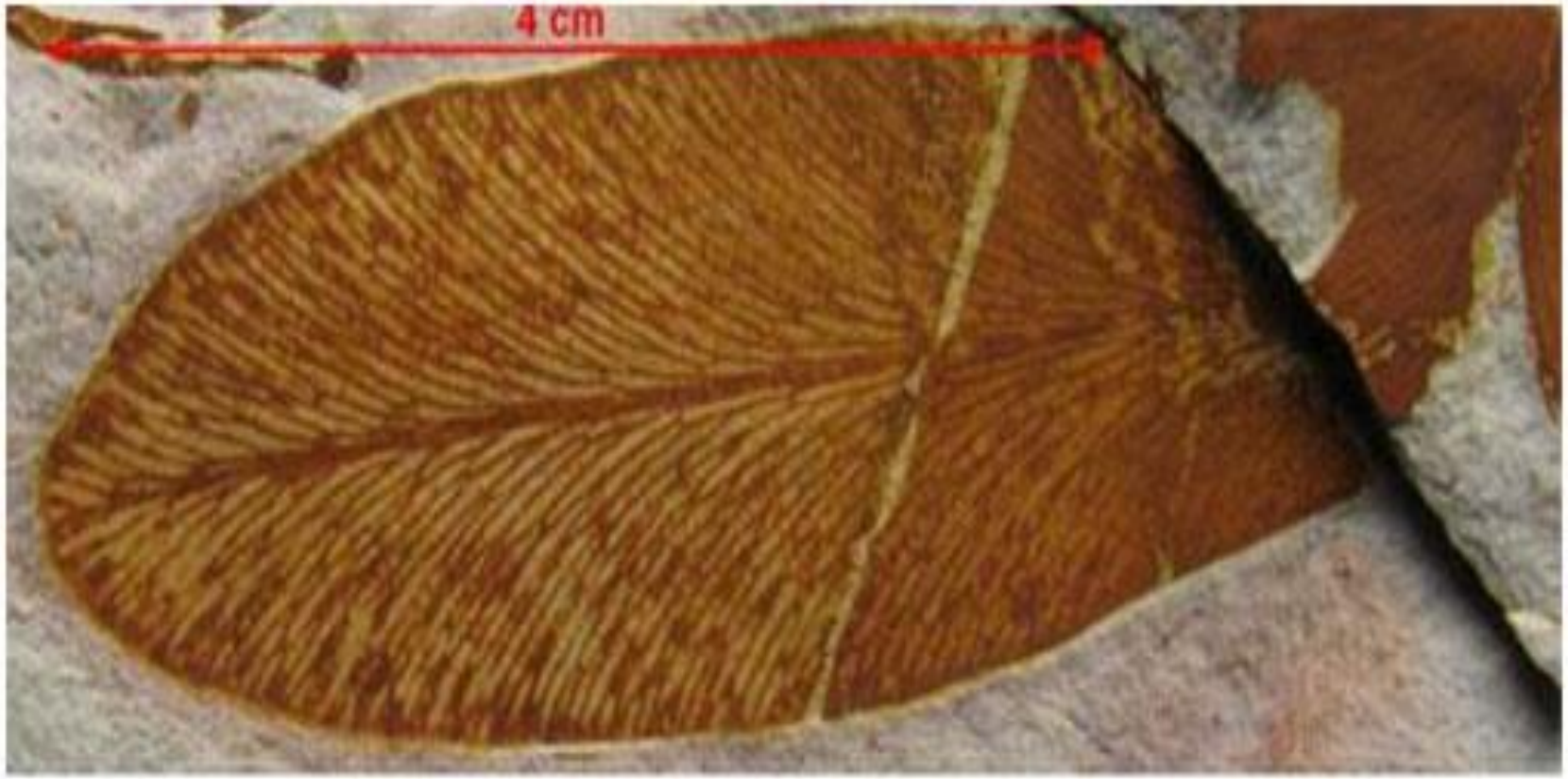
- Glossopteridales included an extinct group of seed plants.
- They were originated during the Permian period on the Gondwana Continent.
- They became the dominant vegetation in the Permian period.
- They extinct completely by the end of the Triassic period.
- The order name derived from the genus glossopteris.


Glossopteridales
Reconstruction

- Glossopteris is the best known member of Glossopteridales.
- Glossopteris is a leaf.
- The name Glossopteris means tongue – fern.
- The name was used to describe fossil leaves from India and Australia that were spatulate and tongue- shaped.

  (glossa = tongue)
- About 70 species of Glossopteris have been recognized from India alone.

Glossopteris – Leaf shape

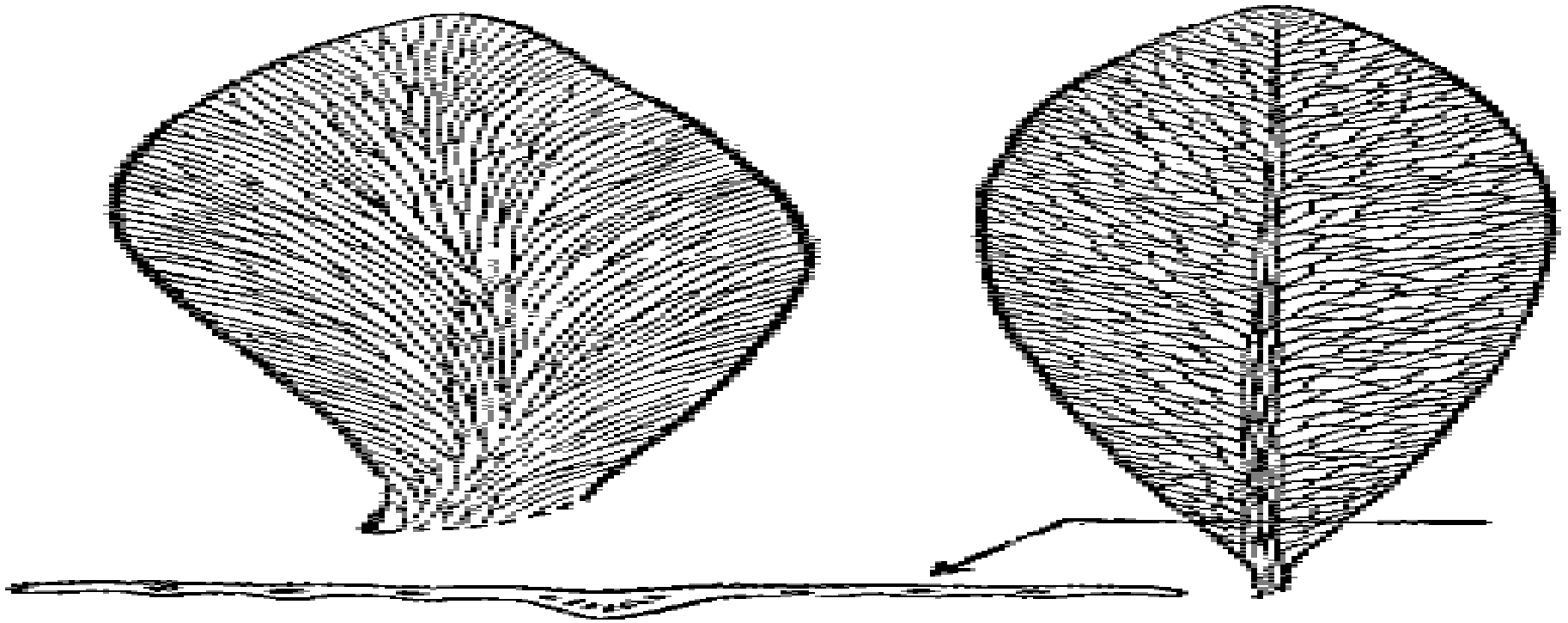


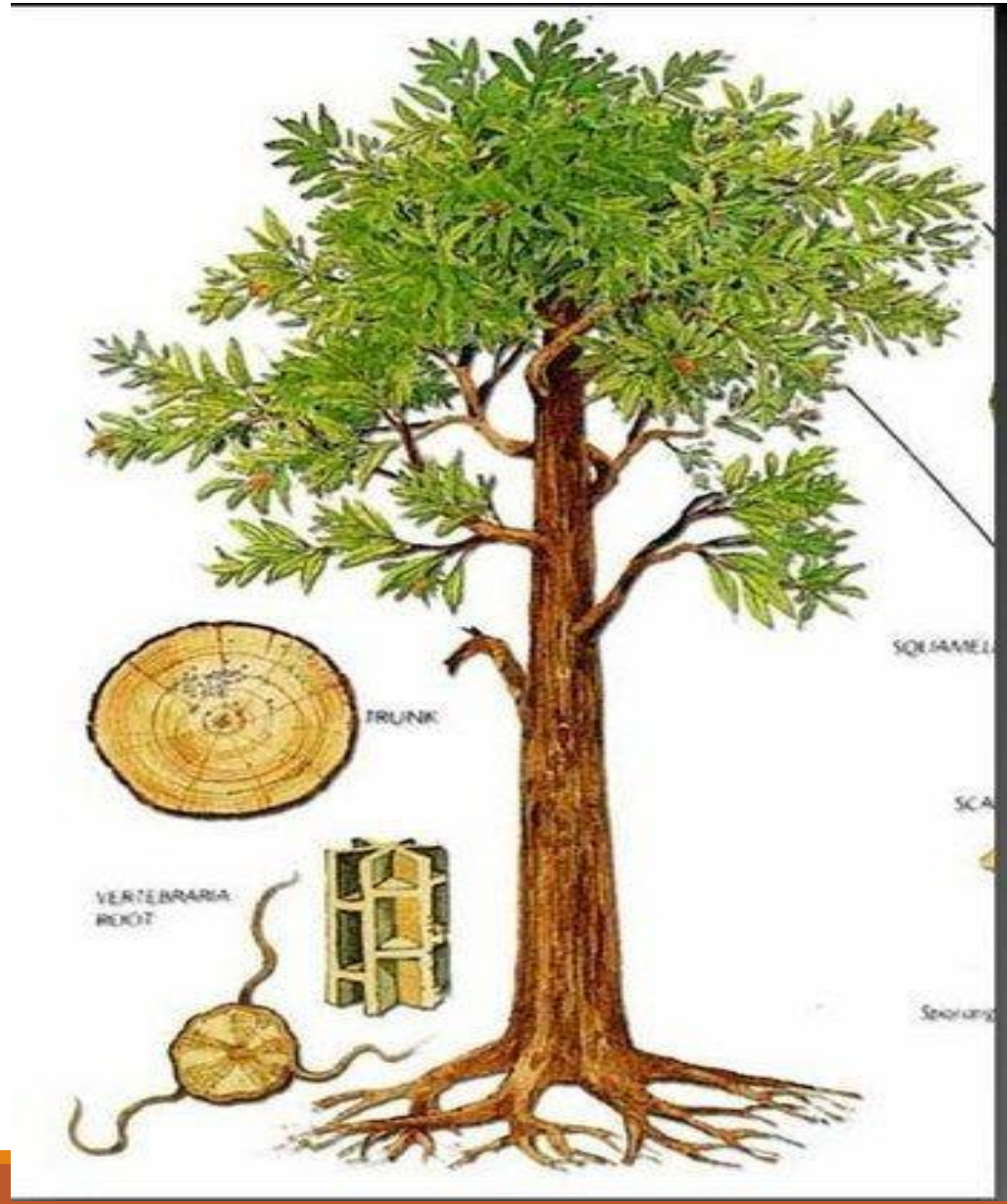
Glossopteris – *'Tongue Shaped Leaf'*

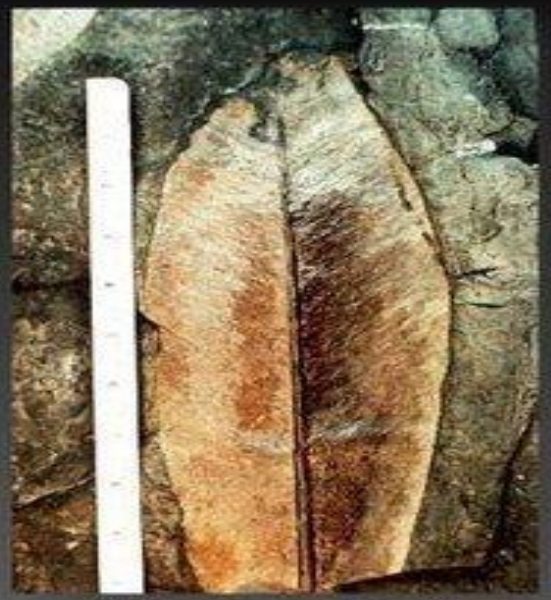
Important genera of Glossopteridales

- Leaves : **Glossopteris , Gangamopteris**
- Stem and Root : **Vertebraria**
- Male Fructifications : **Glossotheca**
- Female Fructifications – two types :
- Cupular Fructifications : **Pterigospermum**
- Multi- ovulate Fructifications : **Scutum**

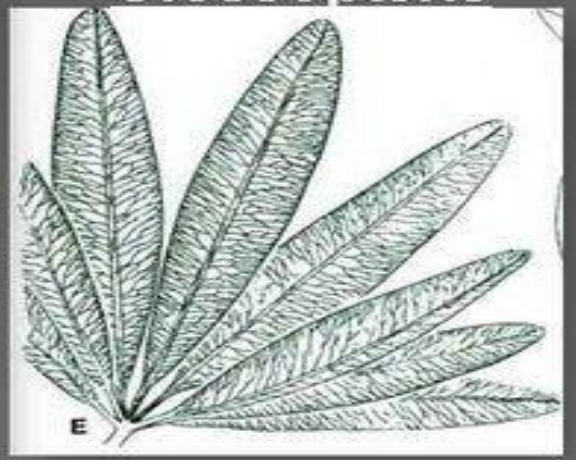
Gangamopteris







Glossopteris



General characteristics of Glossopteridales

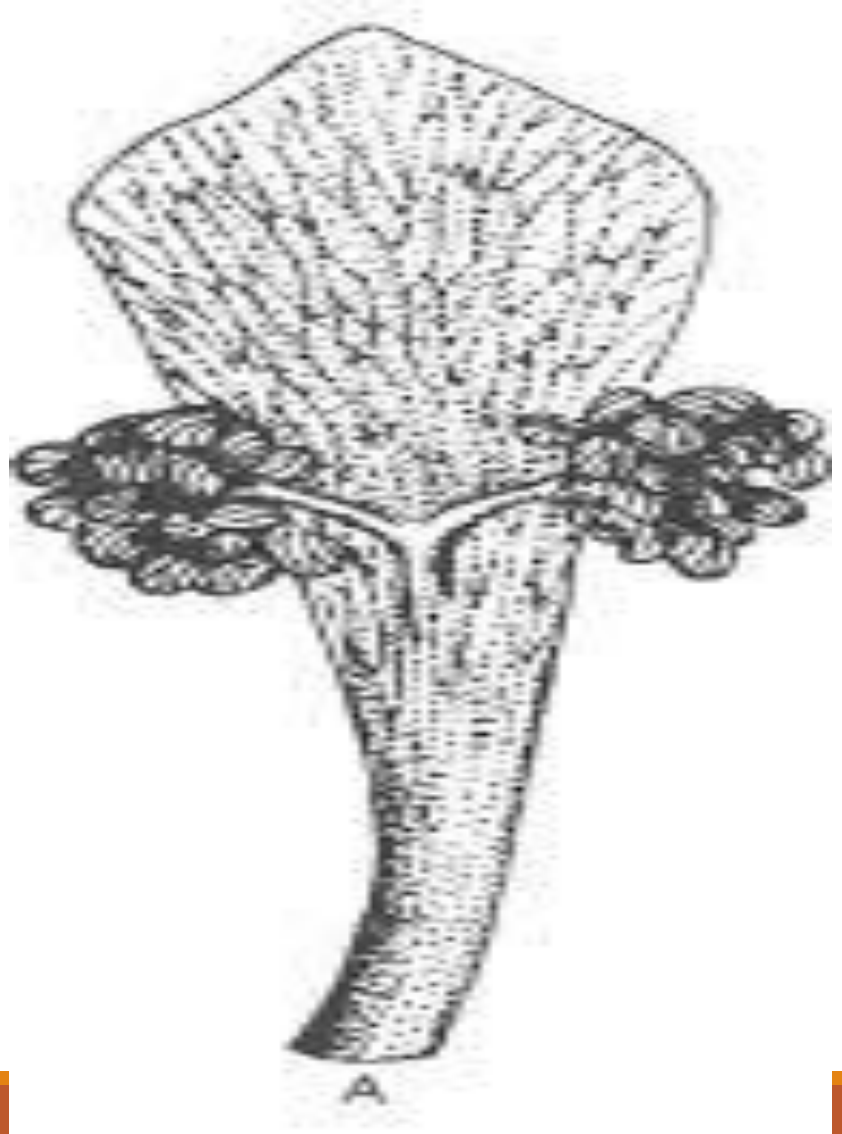
- A small to medium sized highly branched tree.
- Leaves were dorsiventral.
- Leaf lamina was flat in dorsal side.
- Venations were reticulate.
- Veins were parallel but anastomosing.
- Lateral veins originated from the mid rib.

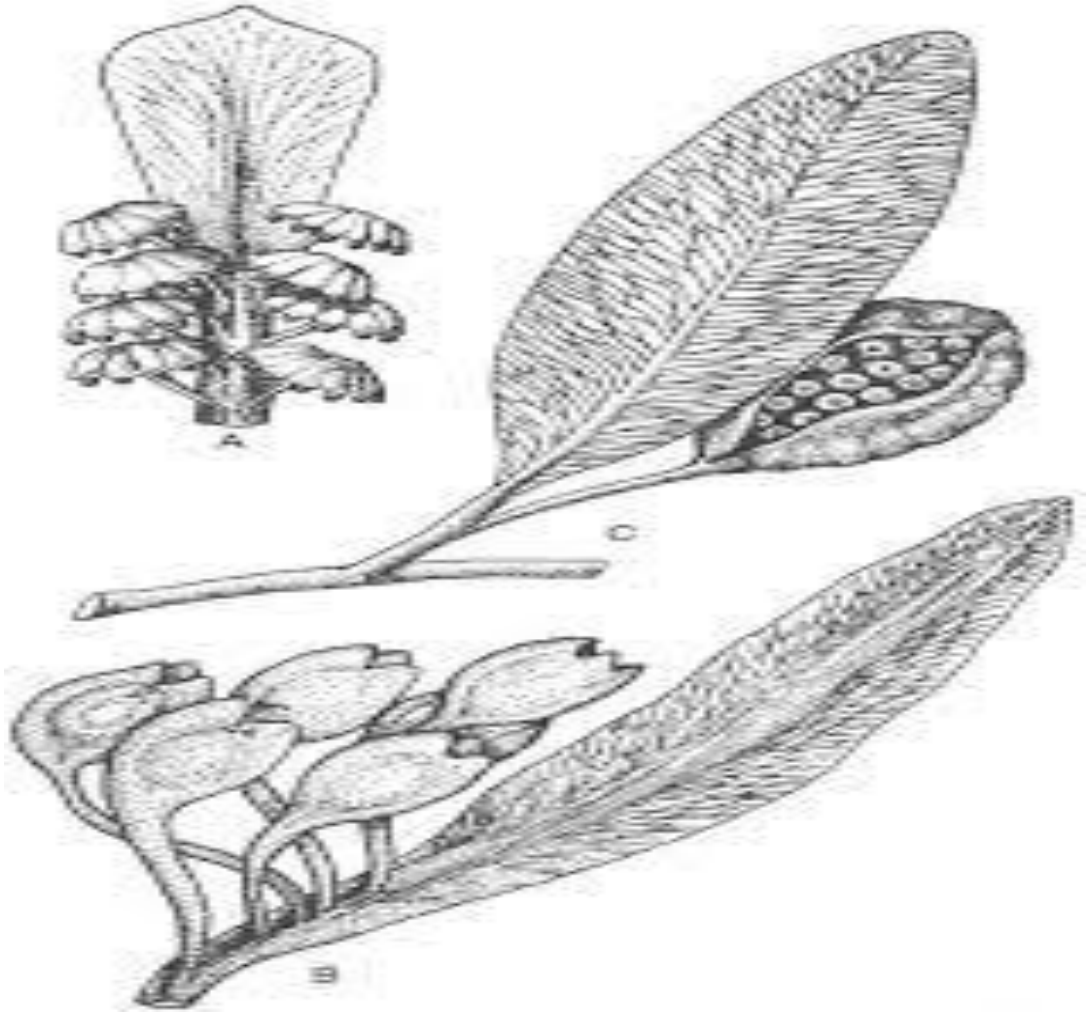
- Midribs were with tracheids of scalariform or pitted thickening.
- Mesophyll was differentiated into palisade and spongy tissues.
- Stomata were present on the lower surface of the leaf.
- Stomata were sunken type , indicate xerophytic adaptation.
- Fructifications of the Glossopteridales poorly preserved in fossils.

- Reproductive structures were born on the leaves as in Pteridospermales .
- Pollen and seeds were produced on separate leaves.
- This indicates unisexual strobilus.
- Pollen grains were produced inside the sporangia.
- Sporangia were formed on modified leaves are called sporophylls.

- It consists of a stalked fertile leaf with Glossopteris type of venation.
- The stalk of the fertile leaf bears three or more pedicels.
- Each pedicel bifurcates into two branches and each branch further divides by repeated dichotomy.
- The final slender branches bear one sporangium each.

Male fructification of Glossopteris from India - Glossotheca

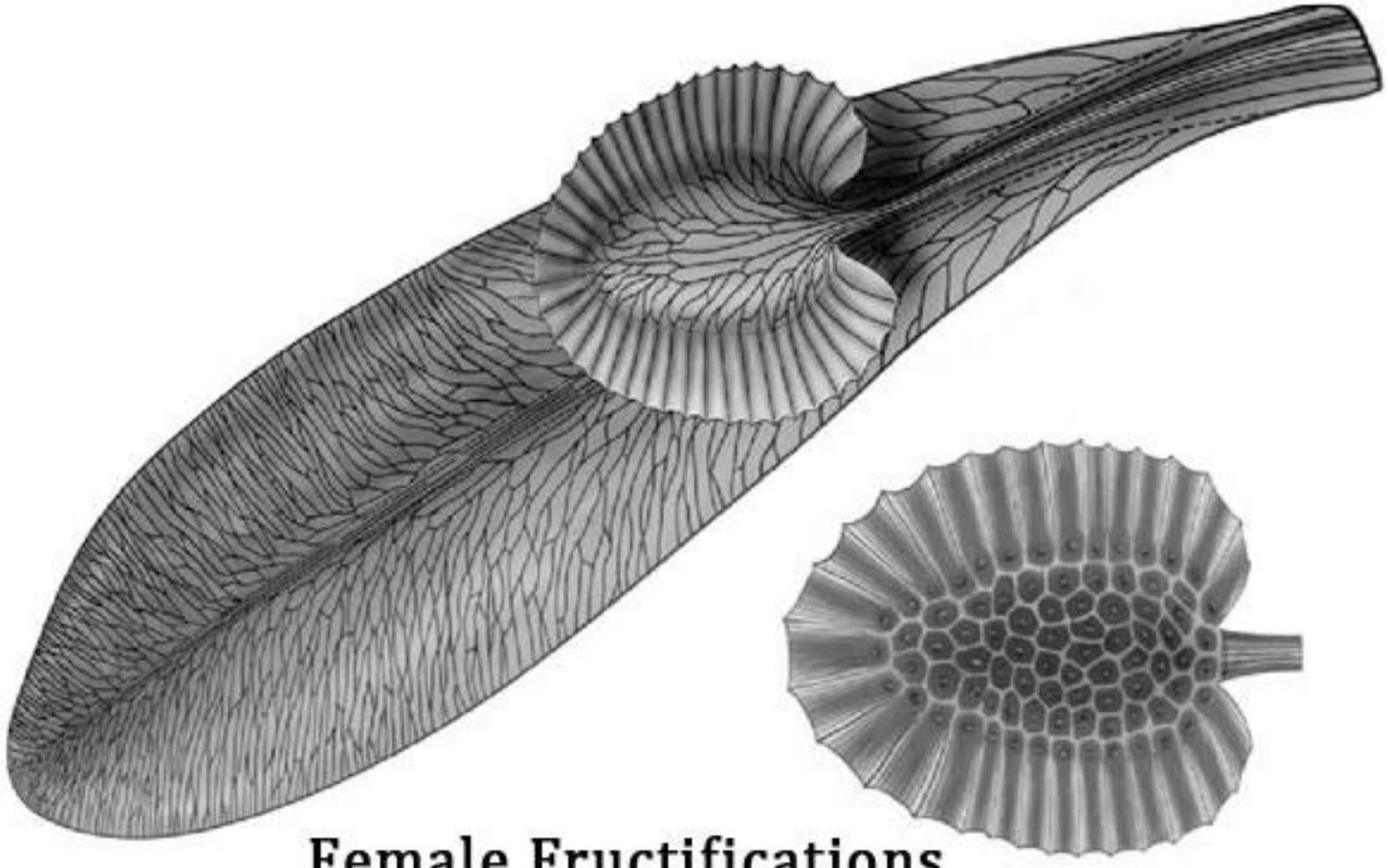




- These are the only records of sporangia and male fructifications with suspected affinities to Glossopteridales.
- Each sporangium bear stalked pollen sacs.

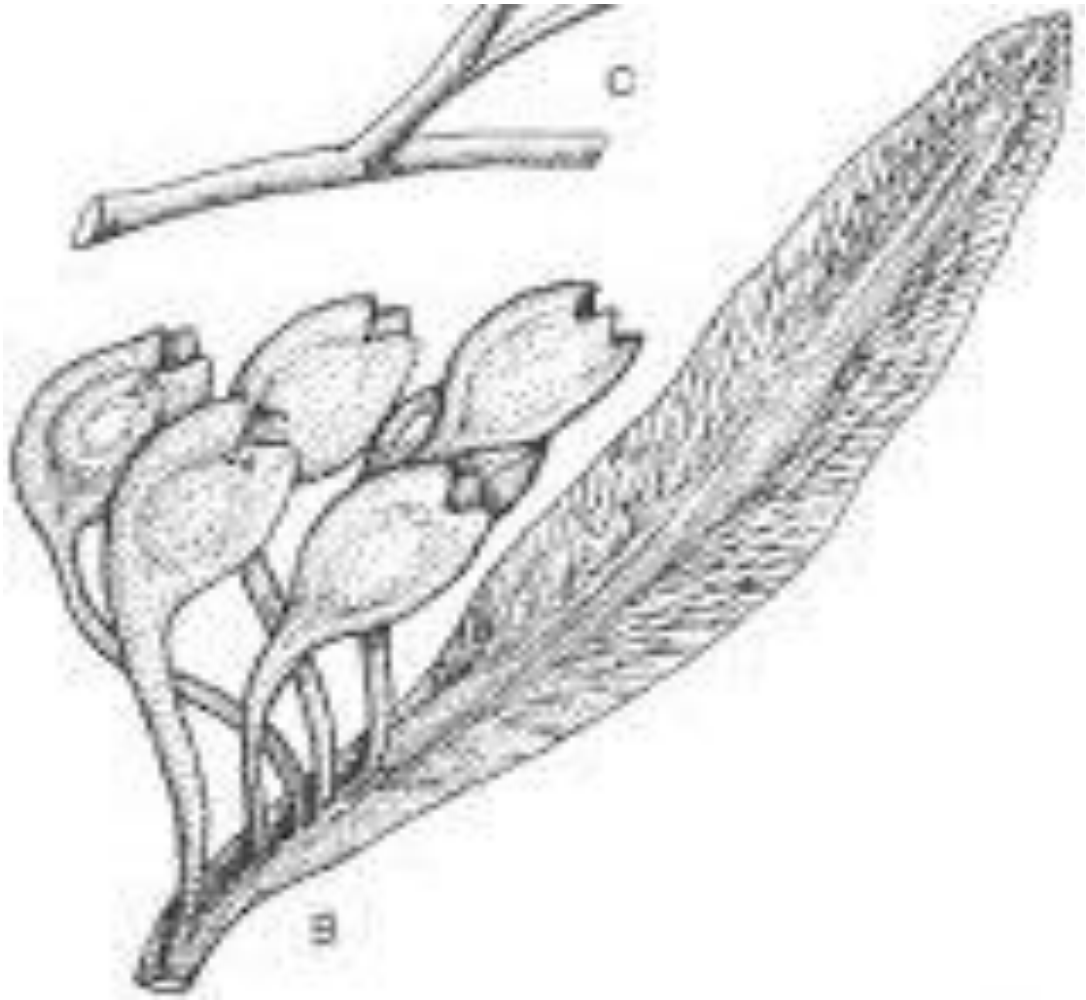
Female fructification

- Ovulate bearing organs are more preserved in fossils than pollen.
- Female structures were very diverse indicating a wide diversity among this group.
- Seeds were produced on the under surface of the leaves.
- Leaf edges rolled over to form an enclosing structure to protect the seeds.

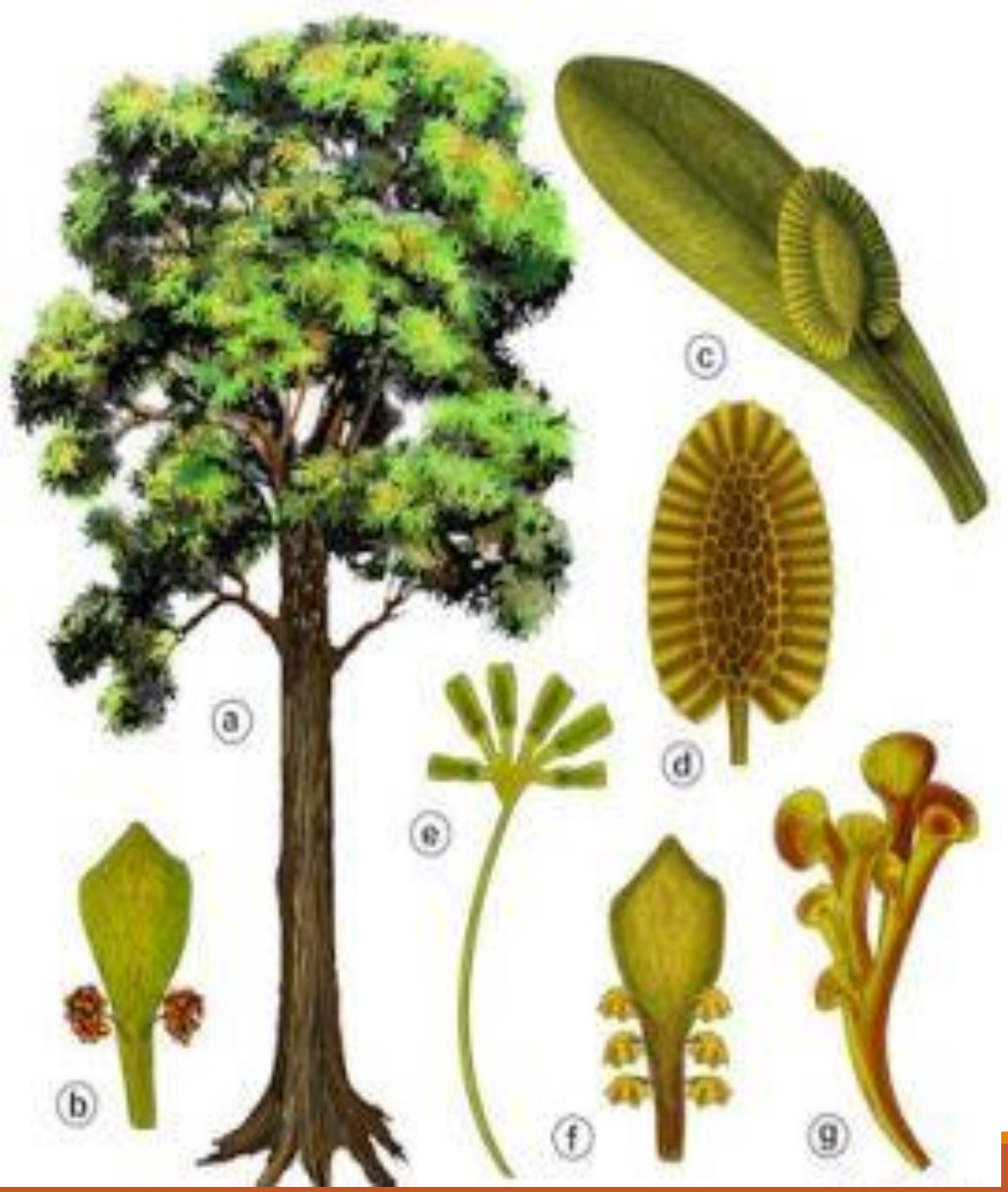


Female Fructifications

Partha indica



Fertile leaf with long petiole; lamina oval-spathulate; no midrib, a few prominent veins run in the middle, secondary veins bifurcate and may form anastomoses; two to four pedicles bearing cupules spring from middle of petiole; one to four, cupules attached at the apical end of each pedicel; or cupules may be in the form of pelt ate discs.



Reconstruction of a Glossopteris plant: a) whole tree b) pollen-producing organ c) seed-bearing organ d-g) different types of ‘fruit’.


THANK
YOU