Subject –Pteridophytes

Topic – Filicopsida

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Filicopsida

Filicopsida is also known as Pteropsida .

It is divided into 9 orders.

- Primofilicales
- Ophioglossales
- Marattiales
- Osmundales
- Schizaeales
- Cyatheales
- Gleicheniales
- Marsileales
- Salviniales

- Pteropsida represent the most highly evolved group among the lower vascular plants.
- In this group are included some of the most beautiful, and most familiar plants called Ferns which are the joy and pride of a gardener.
- The delicate, varied and highly attractive foliage of ferns have made them a must in any garden.
- The living ferns are represented by 305 genera and nearly 10,000 species.

Kingdom - Plantae

Subkingdom -Tracheobionta

Division - Pteridophyta

Class - Filicopsida

Order - Ophioglossales

Characteristics of Order Ophioglossales

- The order is represented by herbaceous sporophytic plants.
- The sporophyte possesses a short, fleshy, naked rhizome that is erect or dorsiventral.
- The sporangia are borne on an outgrowth, the fertile spike which projects from the adaxial surface of the leaf usually near the juncture of the blade and petiole.

- They are further characterized by absence of sclerenchyma and each sporangium in receiving its vascular supply.
- This plant group is without any fossil record.
- The roots are mycorrhizic, thick and fleshy without root hairs and are sparsely branched.
- The spores are chlorophyllous and germinate shortly after dispersal.

- The sporangia are found on the margins of the fertile spikes.
- The number of spores in each sporangium is very large.
- The spores are of one kind, i.e., homosporous.
- The prothalli developed from the spores are saprophytic, tuberous and subterranean.

- *Ophioglossum* (Adder's Tongue) belongs to family Ophioglossaceae of order Ophioglossales.
- The order contains this single family.
- The order has a single family Ophioglossaceae, with three genera.
- Ophioglossum
- Botrychium
- Helminthostachys.

Ophioglossum reticulatum

Botrychium lunaria

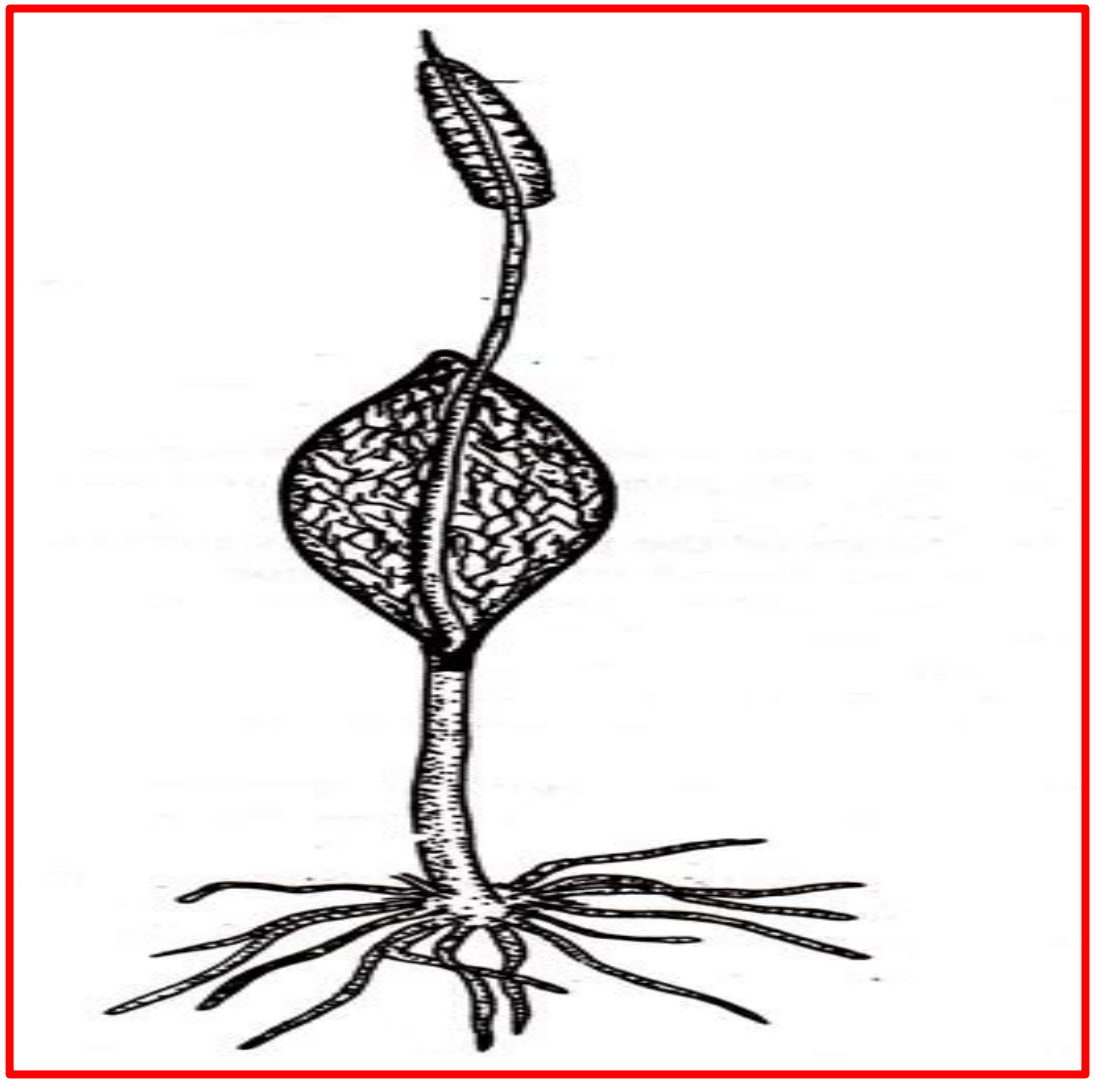
Helminthostachys zeylanica

- According to Clasuen (1938) there are 8 species in *Ophioglossum*.
- They are world-wide in distribution.
- Many species are found in temperate regions, but this is least thrived in the tropics.
  - ***Ophioglossum reticulatum***
  - ***O. vulgatum***
  - ***O. pendulum***
  - ***O. petiolatum***

- The name *Ophioglossum* comes from the Greek , and means "snake-tongue".
- *Ophioglossum* has a high chromosome count in comparison to other species among plant kingdom.
- It has almost 1260 number of chromosomes in the meiocyte (gamete mother cell) which undergo meiosis, the reduction division to form the gamete with only one set of chromosome getting incorporated into each gamete.

- The genus Ophioglossum is the most specialized in the eusporangiate fern family Ophioglossaceae.
- Ophioglossum is characterized by the usually simple but rarely lobed trophophyll (vegetative leaf) with a spike (sporophyll) bearing two rows of sporangia.
- In Ophioglossum, the leaves are simple with reticulate venation.

The leaves are simple with reticulate venation



- Sporangia are borne on a separate outgrowth called ‘fertile spike’.
- This arises at the junction of the leaf blade and lamina. Sporangia have a multilayered wall with a high spore output.
- There is no special dehiscence mechanism.

Ophioglossum pendulum

Ophioglossum vulgatum

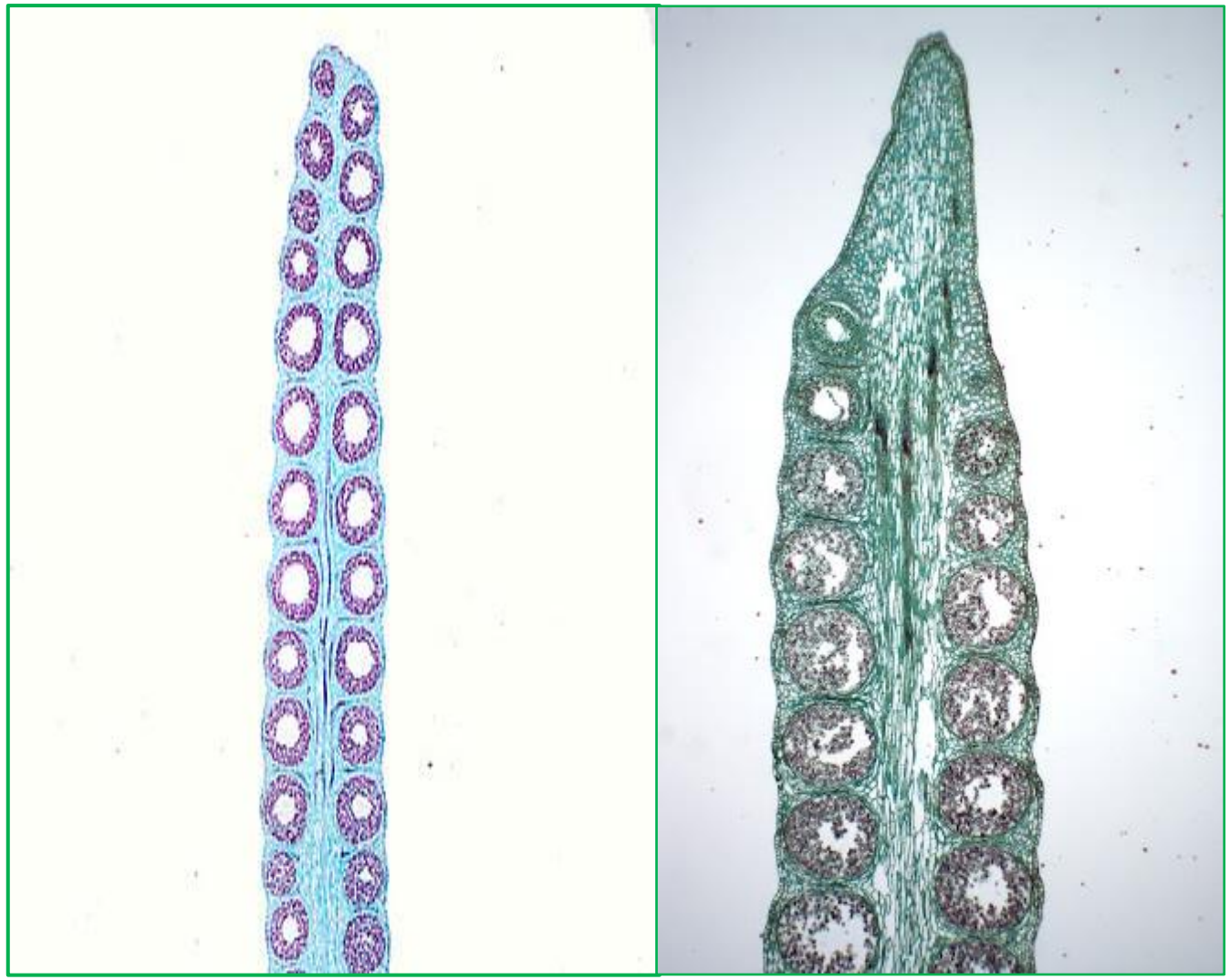
Ophioglossum petiolatum (Stalked adder's tongue)

Morphological Nature of Fertile Spike

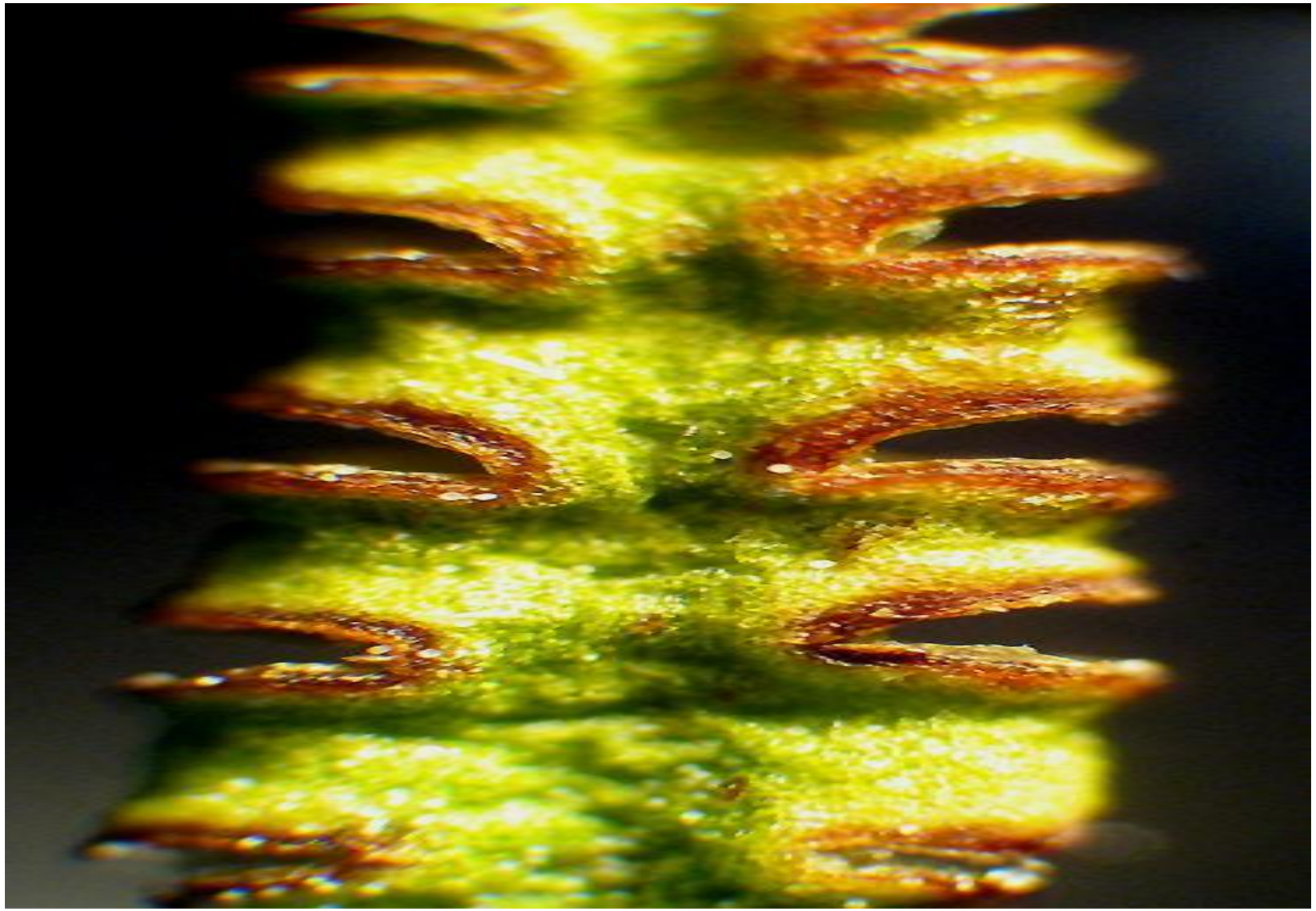
- The morphological nature of the fertile spike controversial.
- According to Bower (1896, 1908) it is a single septate sporangium but this hypothesis has been rejected later on by bower (1911, 1926) himself.
- The pteriodologists of modem days are in agreement that it is pinna like in nature.
- It has been held by Goebel (1915) that the spike represents a single pinna.

Fertile spike of Ophioglossum

Fertile spike of Ophioglossum L.S

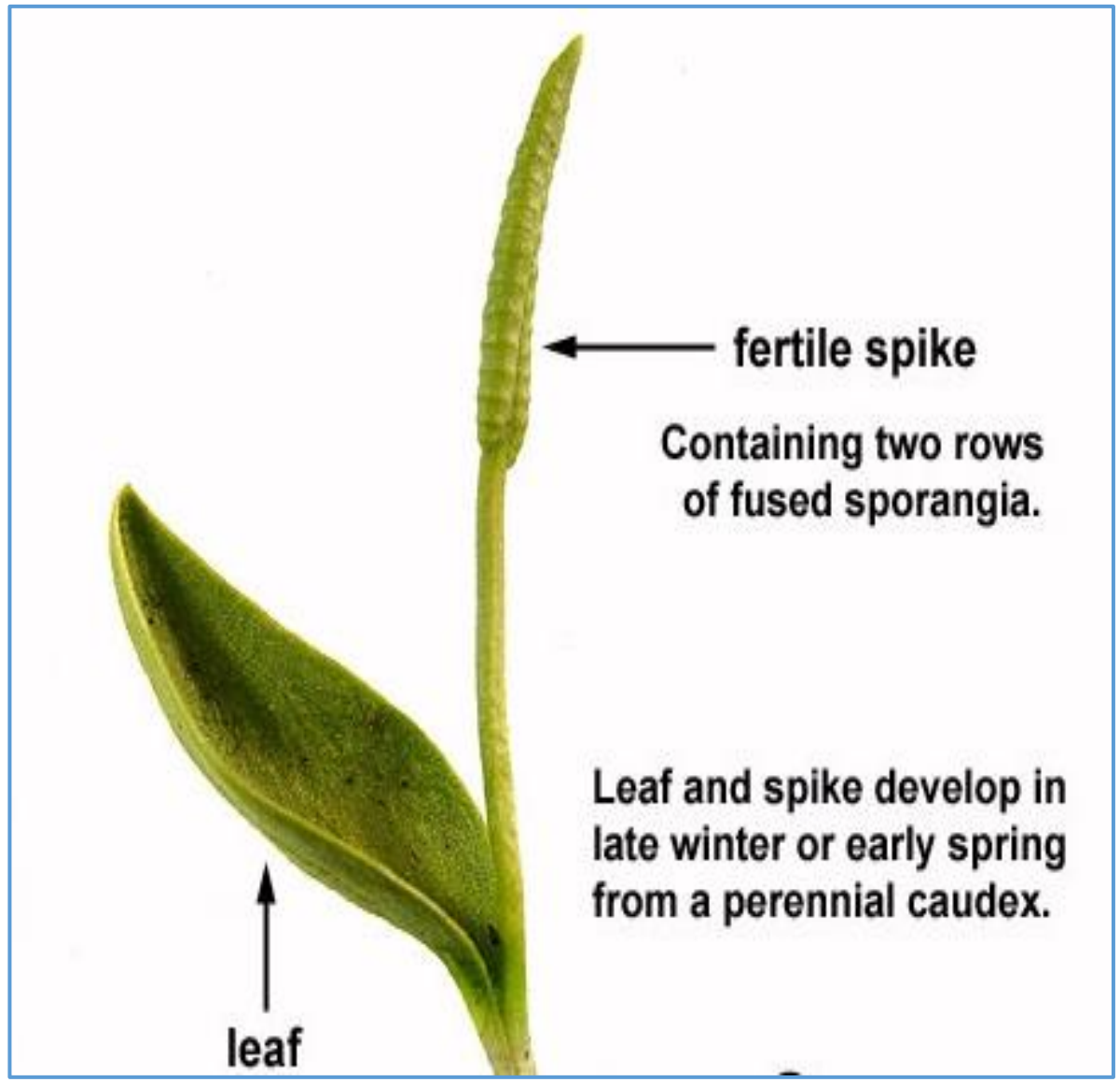


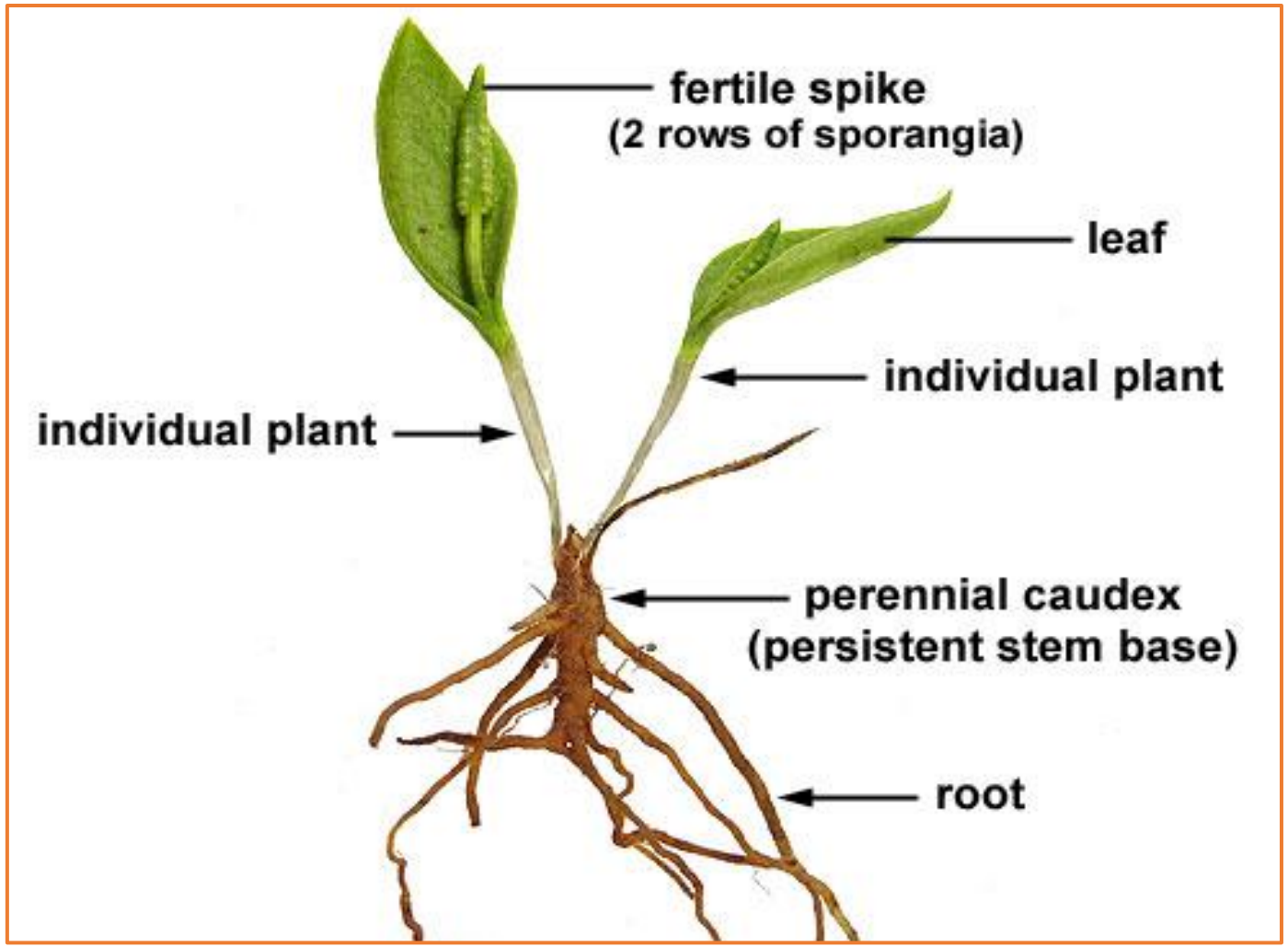
Opening sporangium of Ophioglossum



- But according to Chrysler (1910) it is more probable that the fertile spike represents the fusion of the two basal pinnae of a leaf.
- This interpretation has been supported on the basis of vascular supply.
- The fertile spike has the same vascular supply as would to a pair of pinnae.

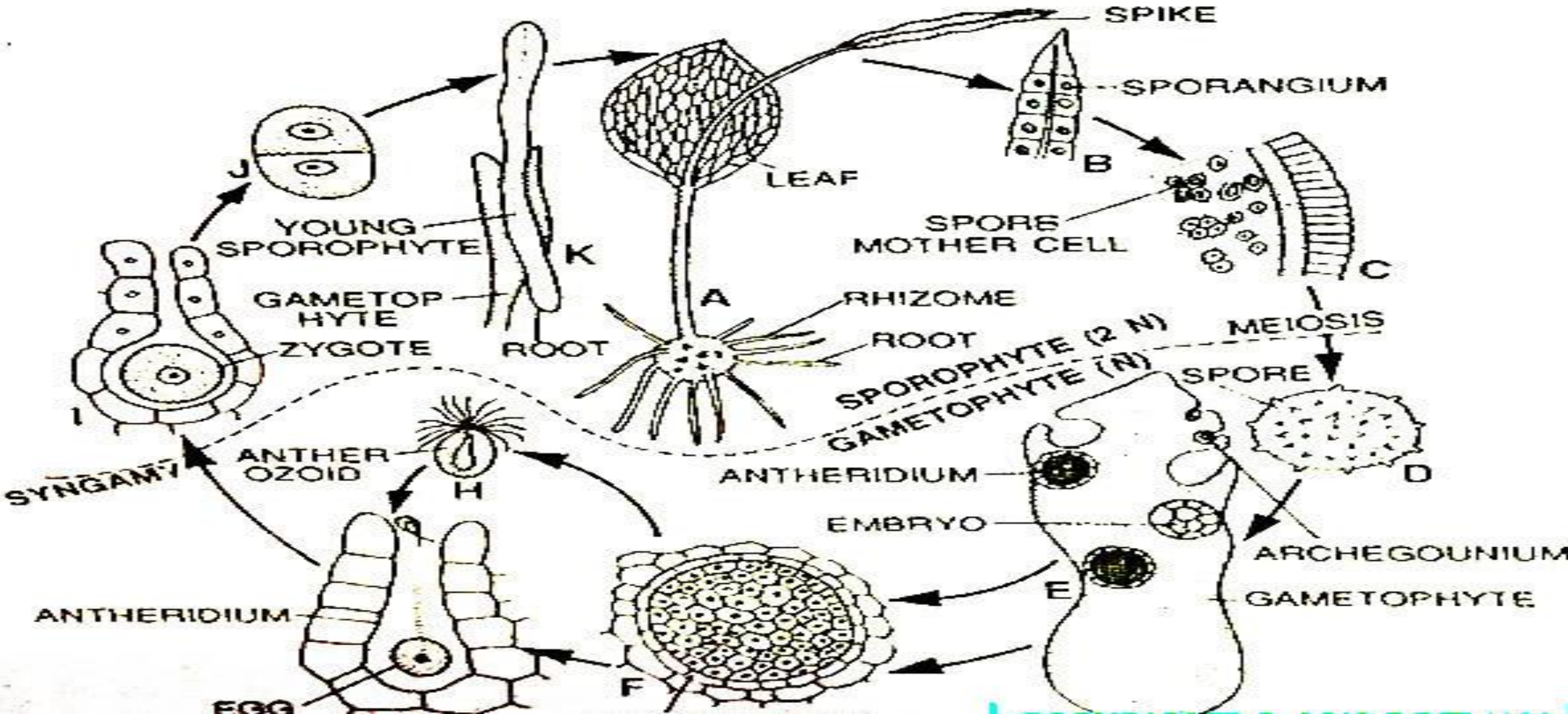
- Each plant typically sends up a small, undivided leaf blade with netted venation, and the spore stalk forks from the leaf stalk, terminating in sporangia which are partially concealed within a structure with slit sides.


fertile spike
Containing two rows
of fused sporangia.
Leaf and spike develop in
late winter or early spring
from a perennial caudex.
leaf


fertile spike
(2 rows of sporangia)
leaf
individual plant
individual plant
perennial caudex
(persistent stem base)
root

- When the leaf blade is present, there is not always a spore stalk present, and the plants do not always send up a leaf, sometimes going for a year to a period of years living only under the soil, nourished by association with soil fungi.
- The plant grows from a central, budding, fleshy structure with fleshy, radiating roots.

Life cycle of *Ophioglossum*




Thank you