

Rhynia

Rhynia - of which two well defined sps R. major and R. gwynnevaughani was discovered by Mackie in 1913 from middle Devonian Rhynie chert in Scotland and was fully described by Kidston and Lang in 1917. This discovery established the Psilophytales as a separate and distinct taxon.

There is evidence that these plants were of gregarious habit growing in swampy marshes near volcanoes where the atmosphere contained sulphurous vapour and the soil was acidic. The reconstructions are from silicified petrification. The systematic position is as follows -

gregarious - (समूह में रहने वाला)
 living in flocks)
 swampy (स्वामी):
 दलदली (बोग्स)
 (full of bogs):
 Bogs = दलदल
 Marsh (मार्श) = दलदल (Fen)
 Volcanic = ज्वालामुखी
 vapour = गैसीय भाव
 झा, वायु

- Psilophyta
- Psilophytopsida
- Psilophytales
- Rhyniaceae
- Rhynia

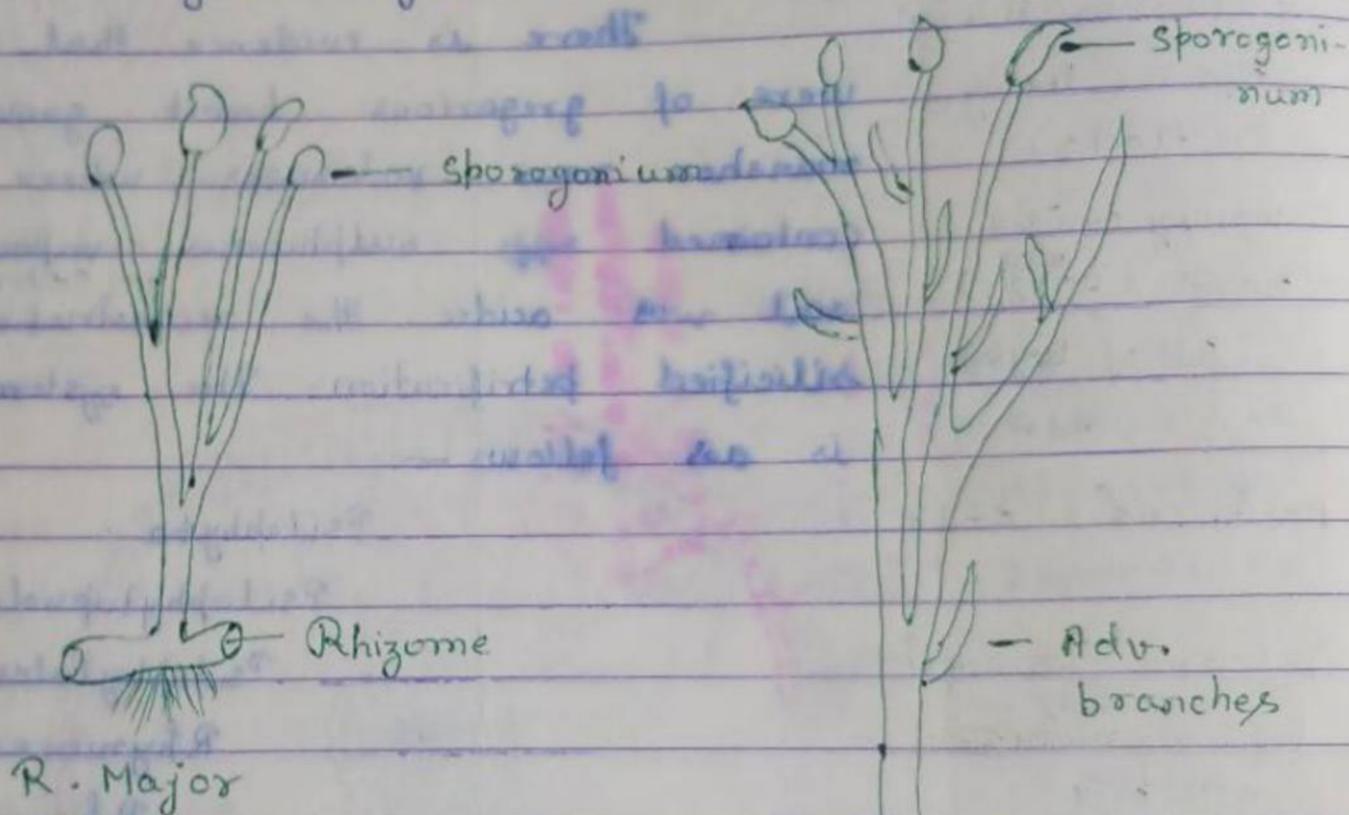
silicified = silica से
 petrification = दृढ़
 bore = छेद
 sparsely = अल्प
 Naked = unsheathed

The adult sporophyte

Rhynia - the most primitive terrestrial sporophyte consists of a cylindrical 'subterranean rhizome' - that bore upright, leafless, erect, cylindrical aerial shoots which branched dichotomously, though rarely nigrescens. The rhizome bore rhizoids. The aerial stems taper gradually to the tip. The tips of the branches are pointed or bifid. The branches are upright oval spore-bearing stems which are lighter than the stems. Both the rhizome and aerial stem are similar, except stomata

photosynthetic cortical cells which were absent in rhizomatous stem.

In the centre is a slender protostele with a small central xylem surrounded by phloem. Endodermis and pericycle was absent. The cortex is divisible into outer and inner zones. The epidermis is single layered.



Reproductive structure

The sporangium was merely a modified terminal part of the axis devoted for spore production. The sporangium was oval and cylindrical structures with pointed ends at the apices of the dichotomies. The thick sporangial wall was divisible into an epidermis denoting the outermost cuticularized layer - a 3 celled

thick middle layer and an uniseriate tapetal cells. The sporangial cavity was packed with numerous spore tetrads or free spores. The sporangia did not exhibit any sign of its dehiscence. The spores were spherical, large and covered with a thick cuticle.

speculation = धारणा, चिन्ता

specimen = sample

pattern = प्रारूप, नमूना

Gametophyte - There is some speculation and controversy regarding the gametophyte because there was no trace of prothallial structure in the fossilized specimen discovered from the 'Rhynie chert'

Puri (1961) is of opinion that

Rhynia had a homologous gametophyte and according to him, some of the plants described as sporophytes may be gametophytes eg. some smaller *R. gwynne-vaughani* may be gametophyte of the larger *R. major*.

suggest = संकेत करना।

Recently = हाल ही में।

uncommon = सामान्य नहीं।

नहीं पाया जाता है।

claim =

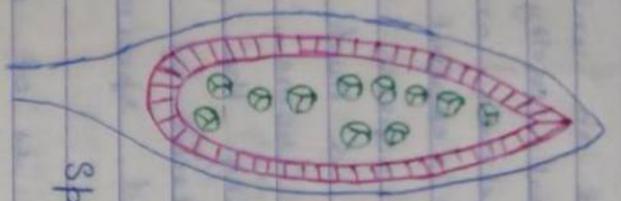
स्वल्प उत्तमान।

This suggests a vesicular gametophyte which is uncommon, though not completely absent among pteridophytes. Recently Lemoigne (1968, 69) has demonstrated the occurrence of archegonia with four celled tops of their necks and egg cells in *R. gwynne-vaughani* and claims the gametophyte nature of *R. gwynne-vaughani*. Although a few putative archegonia have been figured but up to date no clear antheridia have been observed and the evidence for these fossils being gametophyte is still equivocal.

equivocal = दो या अनेक अर्थों में, द्विअर्थी

putative = न sterile

न fertile



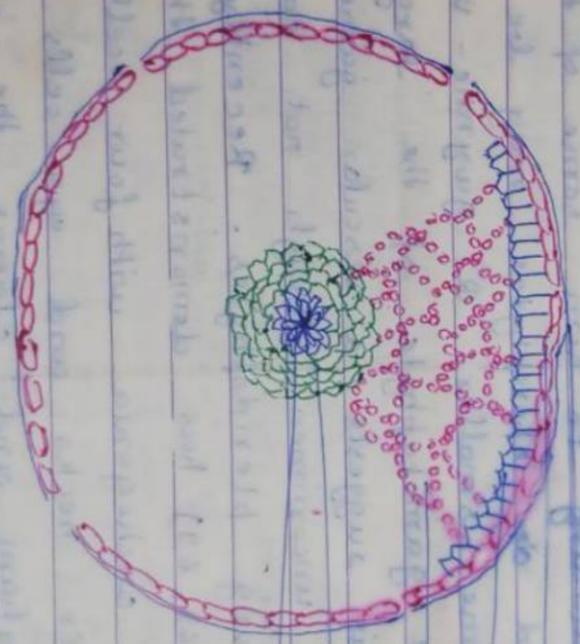
Sporangium



Spore



Spore tetrad



- cuticle
- epidermis
- outer cortex
- inner cortex
- phloem
- xylem

T.S. of aerial shoot

The aerial shoot is a green, branched structure that grows from the leafy gametophyte. It is composed of several layers of cells, including a protective cuticle, an epidermis, and an inner cortex. The central part of the shoot contains vascular tissue, including phloem and xylem. The shoot is anchored to the leafy gametophyte by a basal part of the stem.

Roots

Stomata