

# Porella

①

## Systematic Position:

Division : Bryophyta  
class : Hepaticopsida  
order : Jungermanniales  
Family : Porcellaceae  
Genus : Porella

## Common Indian species:

Porella platyphylla

P. plumosa

P. acutiphylla

P. microloba

Total no. of species: About 180.

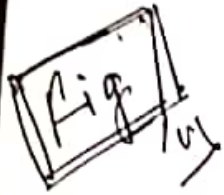
Total no. of Indian species: About 34.

Habit & Habitat: Porella is herbaceous in habit & cosmopolitan in distribution. They grow as a green patch on moist shady rocks, stones and on the bark of trees. In India, most of the species are recorded from north-western Himalayas, eastern-Himalayas & a few from South India.

Gametophyte :- Plant body :- gametophytic plant body is - dorsiventrally flattened, foliose & well branched (bipinnately or tripinnately)

ii) Flant body is differentiated into central axis, smooth walled rhizoids and thin leaves, arranged in 3 rows, two (2) dorsal rows & and one (1) ventral row.

iii) Dorsal rows form the lateral leaves & the lower smaller ventral leaves are called amphigastria.



Dorsal leaves are incubously arranged and each is divided into a larger (anitical) lobe and a smaller (postical) lobe or lobule.

↳ lobe is usually ovate with rounded apex while the lobule is narrower with acute apex.

↳ A large number of smooth walled rhizoids arise from the ventral surface of the stem.

### Anatomy of the stem (Axis): -

i) Axis is differentiated into an epidermis (single layered), cortex (2-3 layered) & medulla

ii) Cortical cells are small and thick walled in comparison to large, thin walled medullary cells.



### Anatomy of the leaf :-

Each leaf is composed of a single layer of isodiametric parenchymatous cells containing many chloroplasts. Leaves also contain oil cells in a few species.

Fig

### Reproduction:

Porocella reproduces both by vegetative & sexual methods.

(a) vegetative reproduction: It takes place by the following methods:

- i) By progressive death and decay of the gametophyte.
- ii) By gemmae.

(b) Sexual reproduction: Porocella is dioecious. Male gametophyte is comparatively smaller than female gametophyte. Male and female sex organs are known as antheridia & archegonia respectively and are developed at the apex of branches in the axils of leaves.

### Antheridium:-


↳ Each antheridium consists of a long-stalk and a globose head/body.

↳ The body has a sterile jacket layer composed of 2-3 layers in the basal part and one (1) layer in the upper part.

Fig

- 4 —
- iii) Within the jacket many androcytes are present which metamorphoses into a biflagellate anterozoid

### Archegonium:-

- i) Archegonia are produced at the apex of archegonial branch on the female plant.
- ii) Archegonium consists of a broad neck and a venter.
-  iii) Neck is composed of five (5) vertical rows of cells and encloses 6-8 neck canal cells (NCC)
- iv) Venter wall is two layered. It encloses a ventral canal cell (VCC) and an egg cell.

Fertilisation: Like other bryophytes, water is essential for the release of anterozoids and eventual fertilisation in terella. The process of fertilisation is found to be similar with members of bryophytes.

### Fr. of Sporophyte:-

- i) The mature sporophyte of Porella consists of a small foot, a short seta and a globose capsule.
- ii) Young sporophyte is covered by calyptra, pericynth & involucre.
- iii) Calyptra developed from the venter of the archegonium, more than one layered thick, which surrounds the sporophyte until its maturity.

- iv) The Capsule is a globose structure and it consists of 3-4 layered jacket in thickness.
- It contains inside numerous spores, and elaters.

Fig

### Dehiscence of the Capsule:

At maturity, the seta elongates suddenly, pushing the capsule out of the calyptra and perianth. As the capsule dries up, the capsule now splits into four (4) valves along the line of dehiscence & the spores are released by the hygroscopic movement of elaters.

### Germination of spores & formation of new gametophyte:-

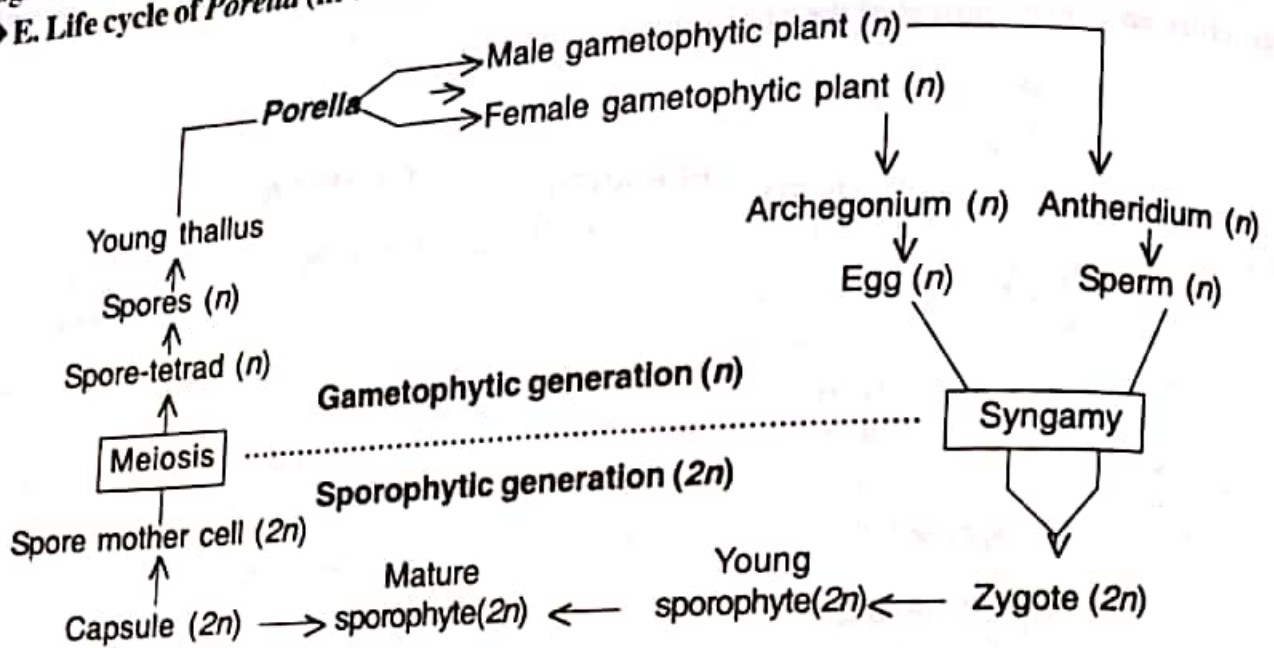
Spore is the starting point of gametophytic generation. Spore wall is thin and provided with two (2) walls, outer exine and inner intine.

The spore, after falling on a suitable, substratum, produces a new gametophyte through a thalloid protonemal stage.

### Life cycle of *Forella* :

See any standard Text Book.

◆ E. Life cycle of *Porella* (in word diagram) :



◆ F. Conclusions —

(1) *Porella* is a member of leafy liverworts, there is differentiation of the gametophyte into axis and leaves, but little or no differentiation of tissues. (2) Gametophytes are dioecious —archegonia are apical in position and hence the position of the sporophyte upon the female gametophyte remains the same. (3) Greater sterilization of potentially sporogenous tissue. (4) Strong development of seta. (5) A definite dehiscence of capsule by four spreading valves. (6) Spore dispersal mechanism is due to hygroscopic movements of the elaters.