EVOLUTIONARY SIGNIFICANCES → Anthoceros sporophyte bears the following important features —

1. The foot surfaces have finger like projections that increase the absorptive surfaces of the same.
2. Seta is meristematic.
3. There is columella in the centre of the capsule for conduction.
4. Stomata are present for transpiration and gaseous exchange.
5. There is green cells for photosynthesis.

The sporophyte can well be compared with the sporophyte of Rhynia but with following differences —

(a) Seta is basal in position in Anthoceros sporophyte whereas it is apical in Rhynia.
(b) Collumella is parenchymatous in Anthoceros but conductive tissues of Rhynia consist of xylem and phloem.
(c) Entire capsule in Anthoceros takes part in spore production where as in Rhynia spore production is restricted at the tips.

If the following changes occur in Anthoceros sporophyte. It can be

easily converted into the sporophyte of Rhynia

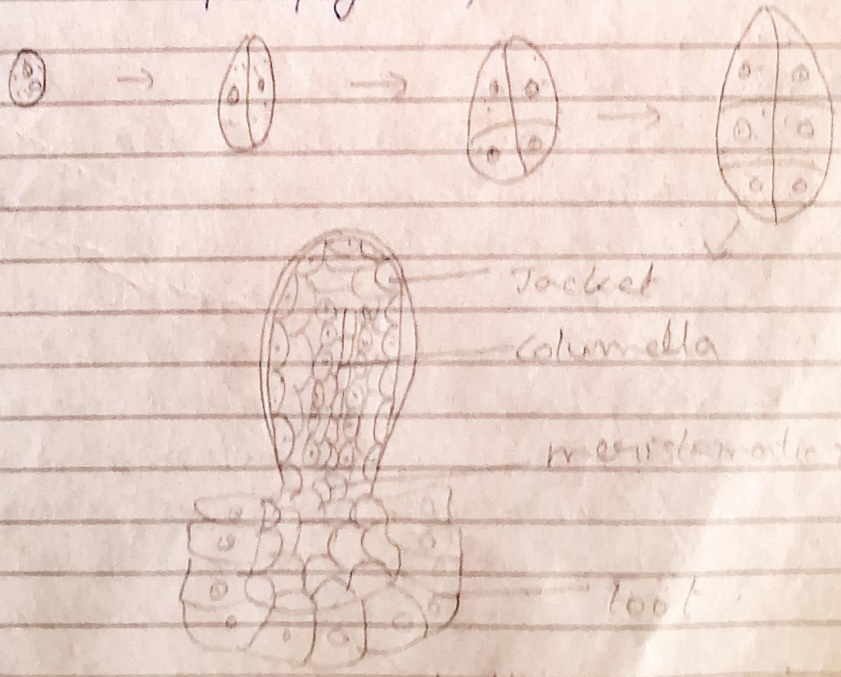
(a) Shifting of basal meristem of Anthoceros to apical portion of the axis.

(b) Dichotomous branching of the Anthoceros sporophyte.

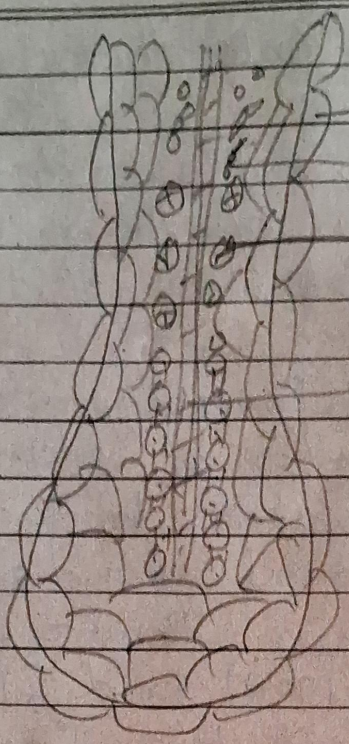
(c) Conversion of parenchymatous columella into the elements of xylem and phloem.

(d) Restriction of spore production of the tip of the aerial branches.

Bower (1908), Goebel (1911), Campbell (1929) and Zimmermann (1935) have pointed out this. There was such changes in sporophyte of Anthoceros that resulted in conversion of the same into the sporophyte of Rhynia. Hence Pteridophyta or vascular plants evolved from the sporophyte of Anthoceros.



Development of Anthoceros embryo



L.S of matured sporogonium of Anthoceros