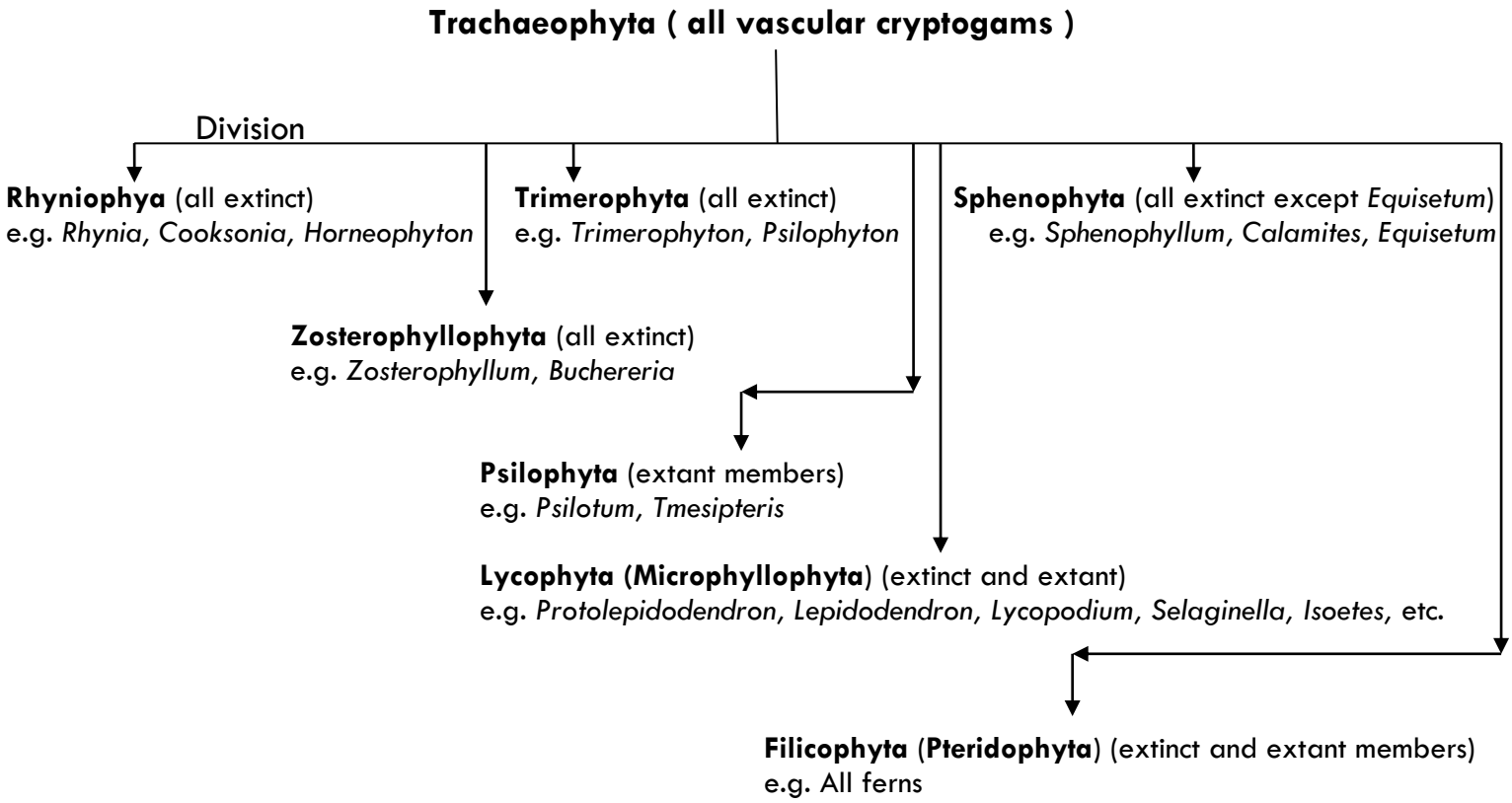
VIVEKANANDA COLLEGE
THAKURPUKUR
KOLKATA-700063

NAAC ACCREDITED 'A' GRADE

Topic: Classification of Vascular Plants by Gifford and Foster (1989)
Course Title: Archaegoniate (Pteridophytes)
Paper: Archaegoniate (BOT-A-CC-2-4-TH), theoretical
Unit: 1.2
Semester: II
Name of the Teacher: Dr. Asis Kumar Pal
Name of the Department: Botany

Classification of Vascular Cryptogams by Gifford and Foster 1989



1. **Division – Rhyniophyta**
   (i) All members are extinct;
   (ii) Plants are rootless;
   (iii) Plants are leafless;
   (iv) Dichotomously branched aerial shoots;
   (v) Sporangia are terminal;
   e.g. *Rhynia, Cooksonia, Horneophyton*

2. **Division – Zosterophyllophyta**
   (i) Members are extinct;
   (ii) Plants are rootless;
   (iii) Rhizome profusely branched;
   (iv) Aerial shoots devoid of leaves;
   (v) Sporangia are borne on the apices of lateral branches;
   e.g. *Zosterophyllum, Buchereria*

3. **Division – Trimerophytophyta**
   (i) All extinct members;
   (ii) Plants are rootless;
   (iii) Plants are leafless;
   (iv) Spirally arranged lateral branches divide di or trichotomously;
   (v) Sporangia are terminal in position;
   e.g. *Trimerophyton, Psilophyton*

4. **Division – Psilophyta**
   (i) Members are extant;
   (ii) Plants are rootless;
   (iii) Sporophytic plant body differentiated into aerial shoots and rhizome;
   (iv) Rhizoids arise in tufts from rhizome;
   (v) Aerial shoots branched dichotomously, either naked or with small spinous outgrowth or reduced leaves;
   (vi) Vasculature protostelic;
   (vii) Sporangia are terminal and may occur solitary or in groups;
   (viii) Sporangia are not associated with any kinds of sporophylls. Sporangium wall several cells thick;
   (ix) Spores homosporous and arrange in tetrads.
   e.g. *Psilotum, Tmesipteris*

5. Division – Lycophyta (Microphyllophyta)

(i) Include both extinct and extant members

(ii) Sporophytic plant body differentiated into root, stem and leaves

(iii) Branching pseudomonopodial or dichotomous with microphyllous leaves

(iv) Sporangia associated with sporophyll, may or may not aggregated to form strobilus

(v) Either homosporous or heterosporous, gametophytes either exosporic or endosporic

(vi) Vasculature protostelic or siphonostelic

e.g. *Lycopodium, Selaginella, Isoetes, Phylloglossum, Stylites*

Extinct members- *Protolepidodendron, Lepidodendron, Lepidocarpon* etc.

6. Division – Sphenophyta

(i) All extinct members except one, *Equisetum*

(ii) Plants have underground, much branched perennial rhizome which bears number of aerial shoots

(iii) Both rhizome and aerial shoots differentiated into nodes and internodes

(iv) Whorls of leaves and whorls of branches arise from nodes alternately

(v) Leaves are microphyllous and stems are with longitudinal ridges

(vi) Sporangia are borne in groups at the peltate disc of stalk like structure called sporangiophore which are again organized into terminal cones on the aerial shoots

e.g. *Sphenophyllum, Calamites, Equisetum*

7. Division – Filicophyta(Pteridophyta)

(i) Both extinct and extant members

(ii) Wide range of habitat, aquatic, terrestrial to epiphytes

(iii) Rhizome creeping or erect, may be dichotomously branched

(iv) Leaves are megaphyllous performing dual functions- photosynthesis and reproduction

(v) Mostly siphonostelic, or dictyostelic even polycyclic siphonostelic

(vi) Sporangial development may be eusporangiate or leptosporangiate type

(vii) Majority homosporous, some are heterosporous

e.e. *Pteris, Dryopteris, Polypodium, Azolla, Salvinia, Marsillea* etc. are extant members.