

## *Protocol appendix: Plant growth type and form*

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The COMPADRE Plant Matrix Database categorises plants (and algae) to one of 11 “growth types”. This document gives a brief overview of each of these types and gives an indication of what *Raunkiaer Growth Form (RGF)* is likely to be represented.

### *Algae*

Algae are plant-like species including basal unicellular organisms up to complex close relatives of higher plants. They are grouped into red algae, brown algae and green algae due to their pigmentation. Reproduction with sexual and asexual stages is mostly complex and include generation changes. Often one sexual (gametophyte) and one asexual (sporophyte) plant is part of the life cycle. Algae live mostly in marine and freshwater ecoregions.

- Not every plant living in water is an algae (higher plants living in water tend to be herbaceous perennials)
- RGF: Hydrophyte



### *Annual*

These plants are called annuals because mostly their life cycle from germination, reproduction to death is completed within a year. Exceptions are biennials and pseudoannuals (life cycle not completed within a year). Type of reproduction is both, sexual and asexual.

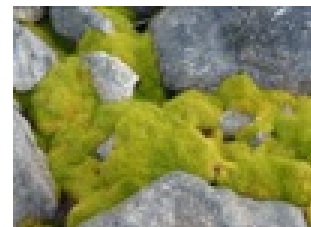
- Often there is a seed bank in matrices.
- RGF: Therophyte



### *Bryophyte*

Mosses are lower plants which grow ground-covering. Their reproduction includes sexual and asexual reproduction, the latter one mostly via fragmentation (seceded parts of moss).

- RGF: Epiphyte, Hemicryptophyte



### *Epiphyte*

Without using nutrients or water from their hosts, epiphytes are growing on other plants (e.g. trees). A distinction is made between higher plants and lower plants (e.g. lichens). Next too common sexual reproduction, mostly lower plants have asexual reproduction as well.



- Migration within population from one host tree to another is possible
- RGF: Epiphyte

### *Fern*

These basal vascular plants are also called pteridophytes. Their reproduction includes one sexual (gametophyte) and one asexual plant (sporophyte).

- Asexual reproduction via spores not equal too seeds
- RGF: Chamaephyte, Nanophanerophyte (big ones), Hemicryptophyte (?)



### *Herb*

Herbaceous perennials have plant parts that survive close to or in the ground (like stems, rhizomes) after growing season, while leaves etc. die. This class also includes bigger plants like banana (Musa sp.). Reproduction is sexual and asexual, clonal reproduction occurs also via stolons (=Ausläufer).

- Seed bank
- Underground parts for vegetative dormancy
- RGF: Hydrophyte, Helophyte, Epiphyte, Geophyte, Hemicryptophyte, Chryptophyte



### *Liana*

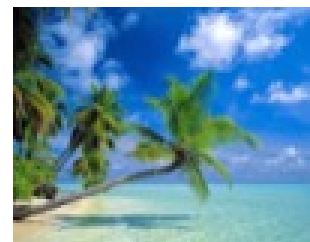
Lianas are woody plants with roots in the soil that use trees etc. to climb towards the light. This growth form is important especially in rain forests where the light on the ground is reduced a lot due to dense canopy of trees. Reproduction is sexual and asexual.



### *Palm*

Palms are all members of one family (Arecaceae). They don't have real wood like trees which has no annual tree rings. Both types of reproduction, asexual and sexual, are part of their life cycles.

- Mostly simple matrices
- RGF: Nanophanerophyte, Mesophanerophyte



### *Shrub*

These are woody plants that are usually smaller than trees and have multiple stems. They reproduce sexually and asexually.

- Sometimes seed bank
- RGF: Chamaephyte, Nanophanerophyte, Mesophanerophyte



### *Succulent*

Succulents like cacti but also lots of other plants store water in leaves and/or stems. They live in arid (e.g. deserts) or salty (e.g. coasts) regions. Reproduction can be sexual or asexual.

- RGF: Chamaephyte, Nanophanaerophyte, Mesophanaerophyte (bigger cacti)



### *Tree*

These plants are woody and have a single stem. Their range of distribution is delimited by the tree line - a spatial border due to less temperature and humidity which is found e.g. in higher longitudes (Arctic) or elevations (alpine). Next to sexual reproduction also asexual reproduction is possible.

- Mostly simple matrices
- DBH: Diameter at Breast Height usually for CriteriaSize
- RGF: Nanophanerophyte, Mesophanerophyte, Megaphanerophyte

