

## B12

### Reproductive strategies of weedy flowering plants in tropical rainforest transformation systems Elvira Hoerandl, Sri Sudarmiyati Tjitrosoedirdjo, Nicole Opfermann

#### Background

- weedy plants, especially invasive species have a strong impact on tropical ecosystems
- breeding systems play an important role for invasiveness of species of flowering plants
- in the understory of tropical palm oil and rubber plantations, the most aggressive weedy species are known to reproduce via apomixis (=asexual reproduction via seed)
- the control of weedy species with apomixis has become a major issue for conservation strategies in tropical ecosystems
- the biological factors for weedy and even invasive behavior in human-influenced landscapes are poorly understood

#### Project outline

The main goal of the project is to investigate the impact of apomictic reproduction on frequent weeds and their ecological and socioeconomic role in transformation systems.

#### Hypotheses

##### Biological function

Frequent weedy understory plants (herbs and shrubs) reproduce predominantly via apomixis, ie. apomictic offspring is more frequent than sexual one.

##### Biodiversity function

Frequencies of weedy apomictic species increase in the understory vegetation of transformation systems with the intense of disturbance and use.

##### Ecological function

Abundance of weedy apomictic taxa reduces biodiversity and ecological community functions in transformation systems.

##### Socioeconomic function

Biological and chemical control of invaders may have impacts on socioeconomic functions.

#### Methods

Two model systems:



Melastomataceae: *Clidemia hirta*



Poaceae: Panicoideae

(both widespread invasive species with facultative apomixis)

Within species: assessment of degree of facultative apomixis vs. sexuality:

- autonomous apomixis: pollen exclusion experiment (removal of pistil (apomixis))
- molecular progeny arrays with microsatellite markers - genotyping and population analysis of seedlings and mother plants
- microscopic histological investigations of embryo sac development
- flow cytometric seed screening

Abundance of apomictic species within plots

Spontaneous colonization of apomictic taxa within enrichment experiment plots

#### Status:

- ✓ pollen exclusion experiment
- ✓ sampling of pre-flowering stages, seeds and leaves
- ✓ abundance of respective species recorded



*Clidemia hirta* flower with removed pistil

Next steps:

- microscopic investigations
- genotyping and population analysis



Oil Palm



Rubber



Jungle Rubber



Forest