



# Germination study of three Fabaceae species, endemic of South-western region of Madagascar



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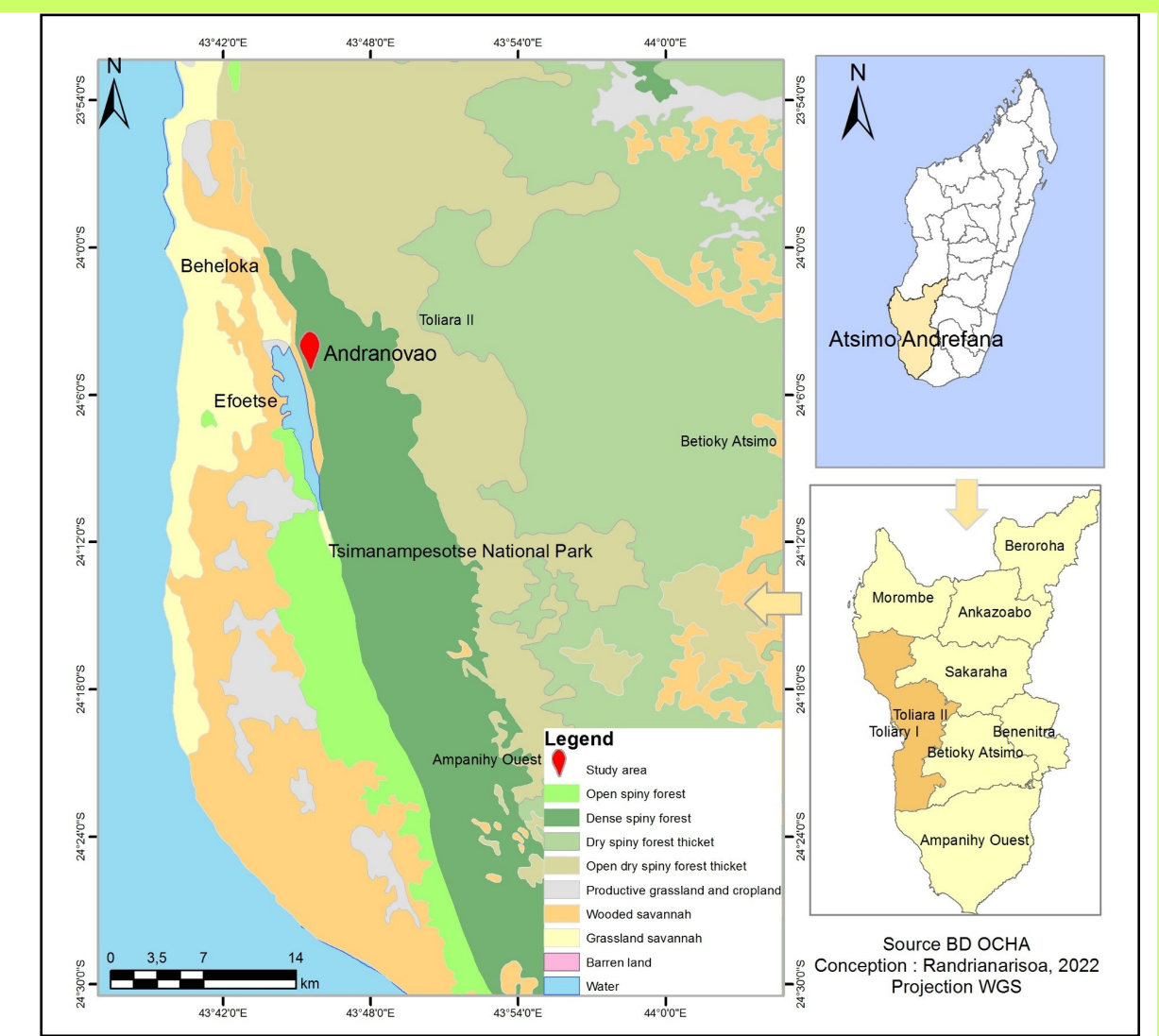
## INTRODUCTION

### FABACEAE :

- Third family diversified in the word's flora, 19 400 species, distributed in the tropics
- Madagascar : 667 species
- Species commonly used for different purposes : construction wood, energy wood, fodder, medicinal plants and cosmetics
- Problems : physiological dormancy of seeds
- Subject : germination test for three woody Fabaceae species encountered in Tsimanampesotse National Park : *Acacia bellula*, *Delonix floribunda* and *Tetrapterocarpon geayi*.
- The general objective is to identify the optimal conditions for germination and growth of seedlings.
- The specific objective are to :
  - ⇒ establish a seed pretreatment ;
  - ⇒ test the effect of seed size on germination ;
  - ⇒ identify the favourable substrate for each species ;
  - ⇒ evaluate the effect of salinity on germination.

## STUDY AREA

- Madagascar
- Region : South-west
- Tsimanampesotse National Park



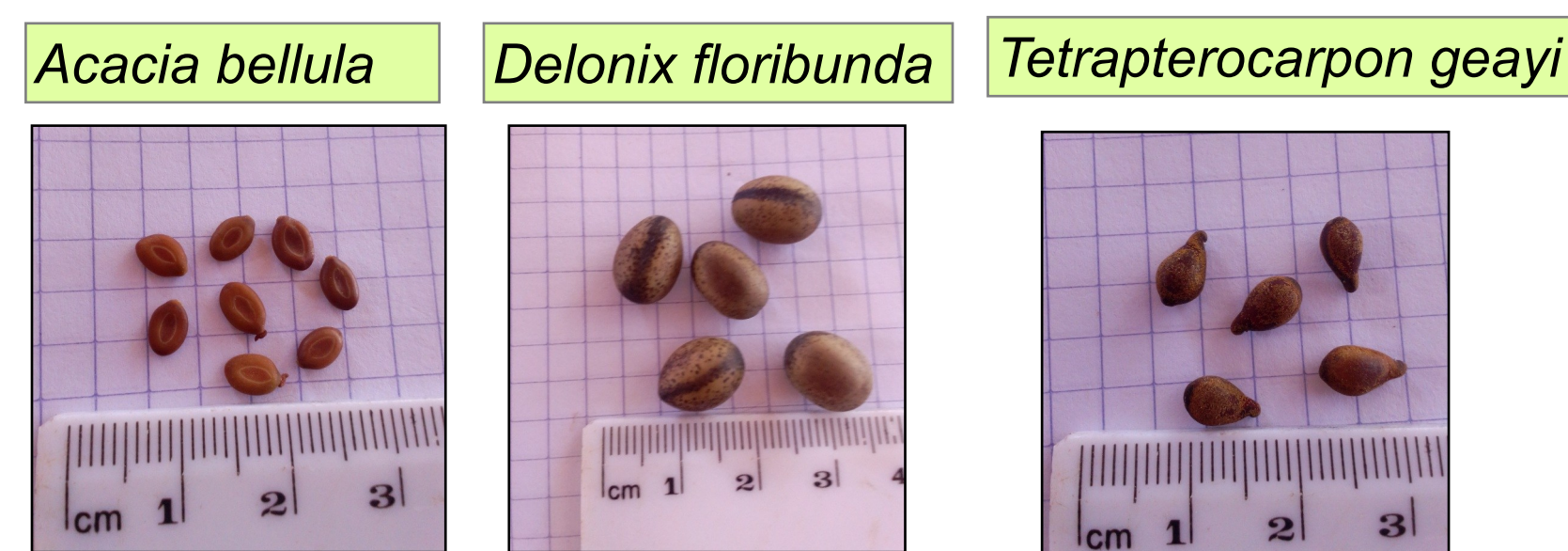
**Figure 1 :** Localization of study area

## MATERIALS AND METHODS

### Seed collected



**Figure 2 :** Seeds collected



**Figure 3 :** Seeds characteristics

### Germination parameters

- Germination rate (%)
- Latency time (days)
- Germination time (days)

Germination rate (%) = Number of germinated seed / Total number of seeds



**Figure 4 :** Germinated seed and seedling of *Acacia bellula*, *Delonix floribunda* and *Tetrapterocarpon geayi*

### Treatments of seeds

#### Seed pretreatment

- Control
- Manual scarification
- Hot water 40 °C during 5 minutes
- Tap water during 24 hours

#### Seed size

Seeds size	Seed weight (g)		
	<i>A. bellula</i>	<i>D. floribunda</i>	<i>T. geayi</i>
Small	0.01	0.56	0.05
Medium	0.02	0.64	0.07
Large	0.03	0.77	0.09

#### Substrates

- Sandy soil
- Ferruginous soil
- Calcareous soil
- Mixture soil

#### Salinity

- Six (06) concentrations of NaCl : 0, 2, 4, 6, 8 and 10 <sup>g</sup>/L

### Experimentation



**Figure 5 :** Experimentation

## RESULTS

### Effects of treatments on germination

#### *Acacia bellula*

- ⇒ Pretreatment : Manual scarification (60 %)
- ⇒ Seed size : Large seed (70 %)
- ⇒ Substrate : Mixture soil (83 %)
- ⇒ Salinity tolerance : High



#### *Delonix floribunda*

- ⇒ Pretreatment : Manual scarification (SM) (59 %)
- ⇒ Seed size : Medium (67 %)
- ⇒ Substrate : Mixture soil (M) (80 %)
- ⇒ Salinity tolerance : Low



#### *Tetrapterocarpon geayi*

- ⇒ Pretreatment : Manual scarification (88 %)
- ⇒ Seed size : Medium (77 %)
- ⇒ Substrate : Mixture soil (33 %)
- ⇒ Salinity tolerance : Moderate

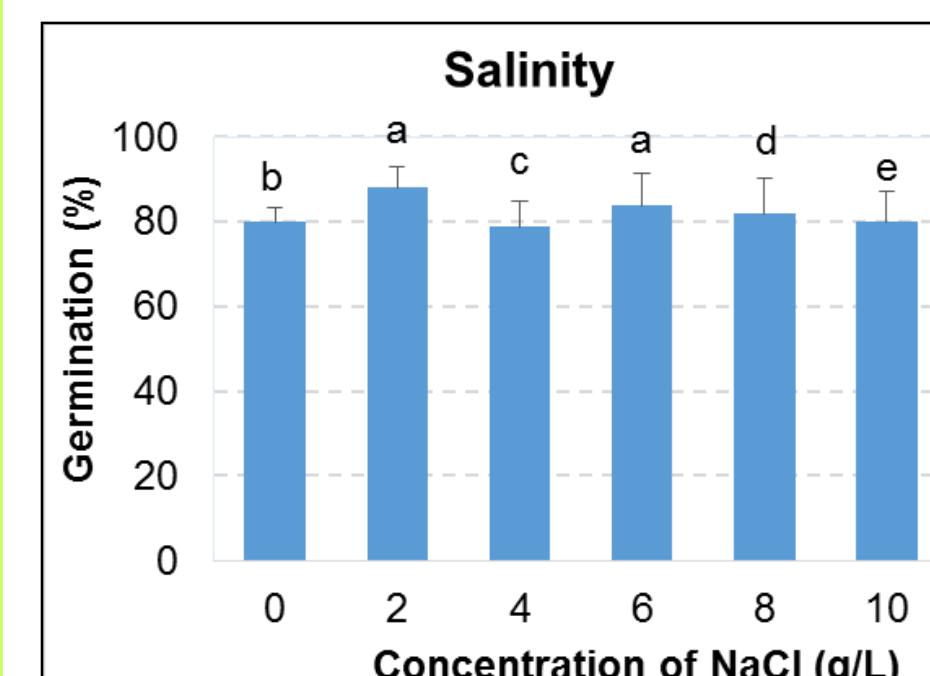
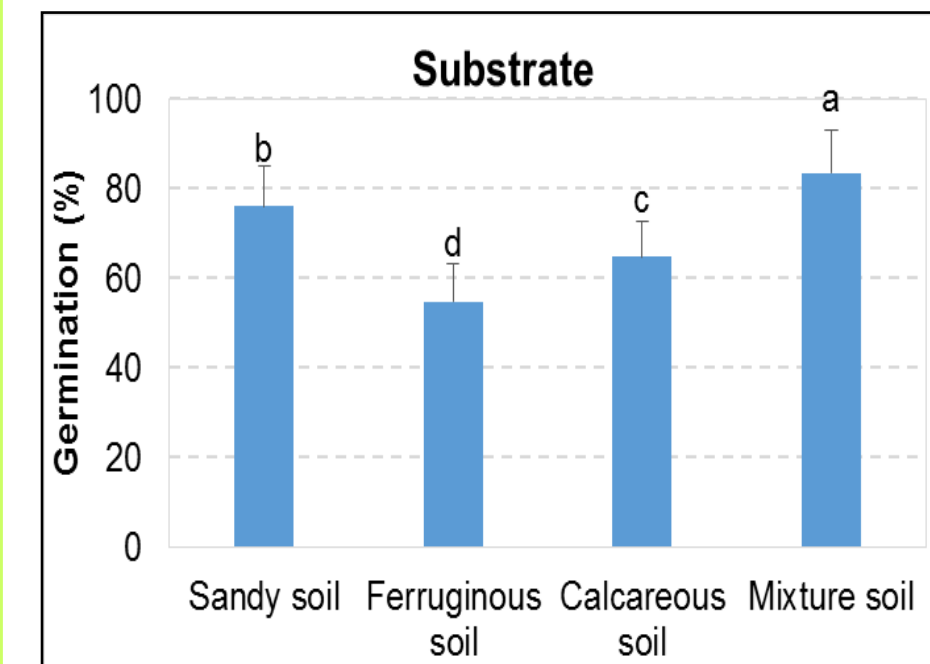
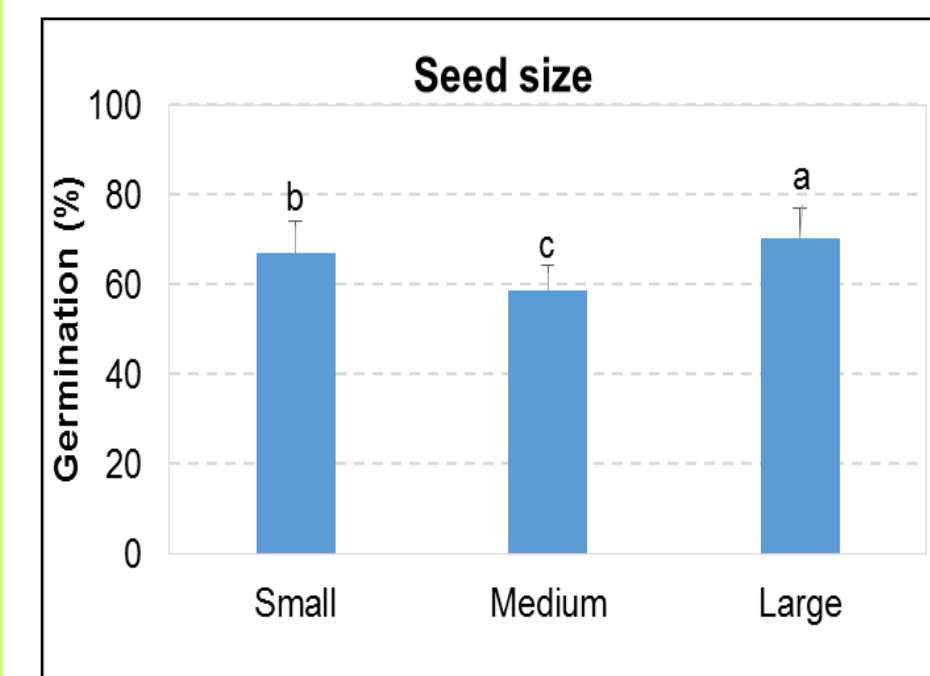
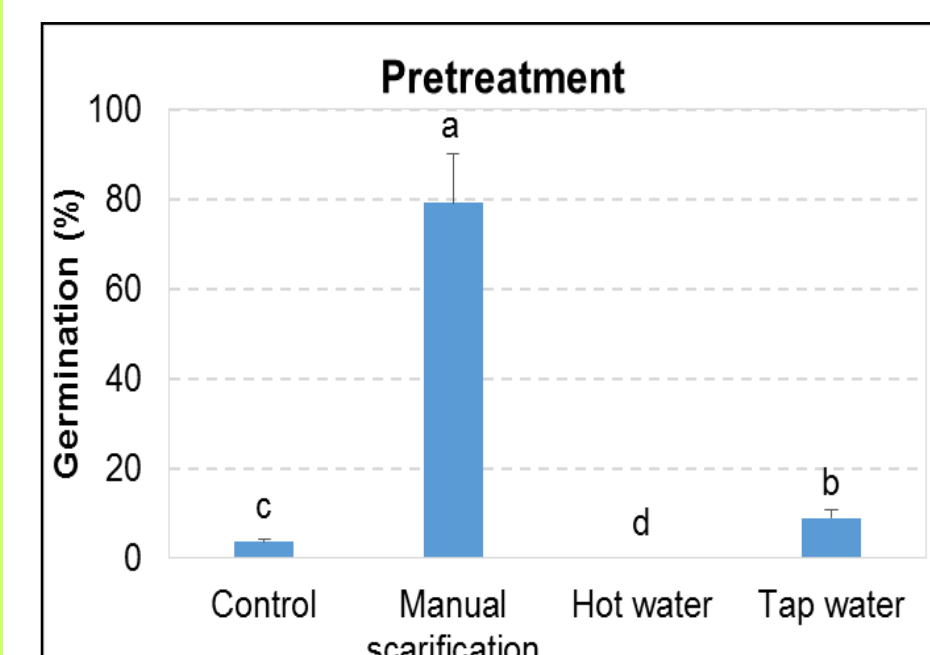


## CONCLUSION

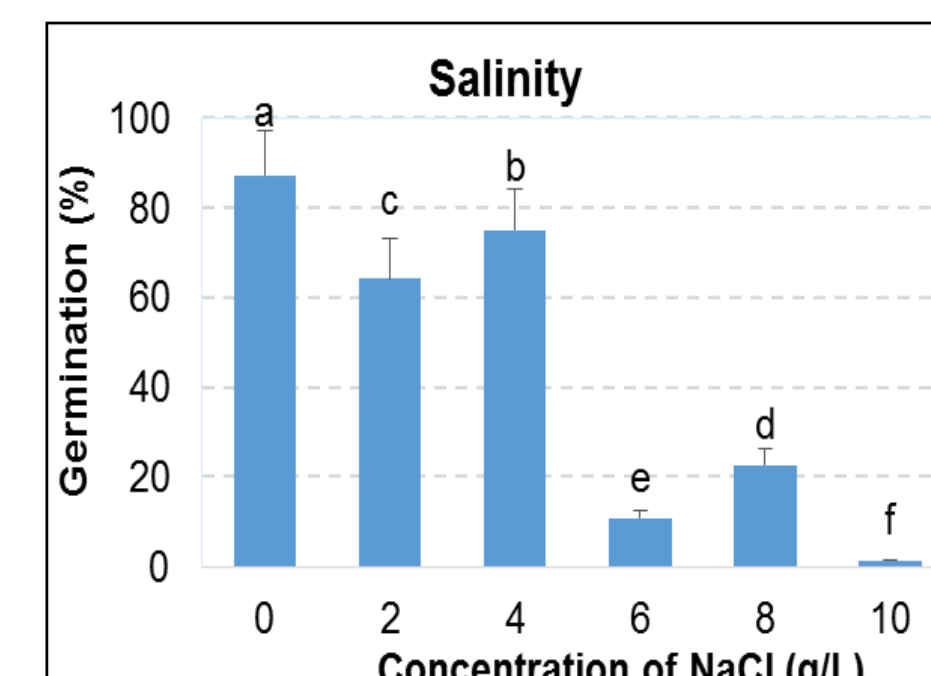
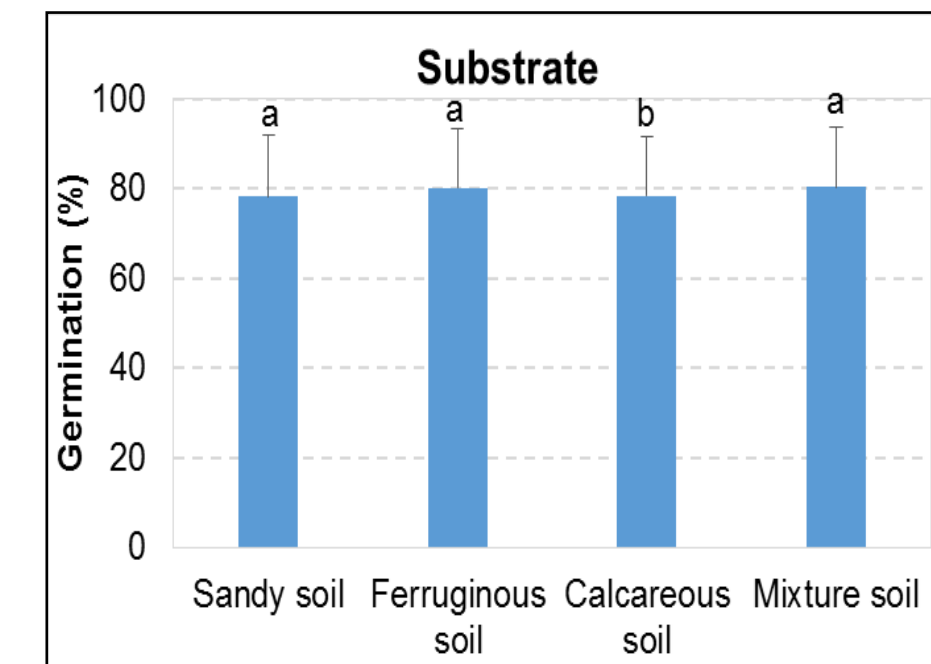
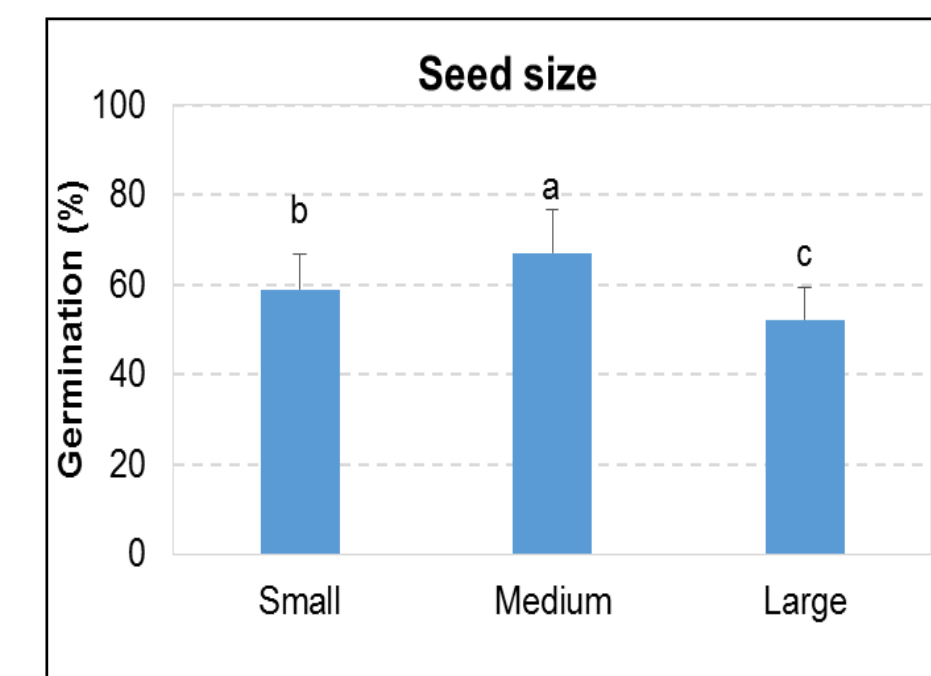
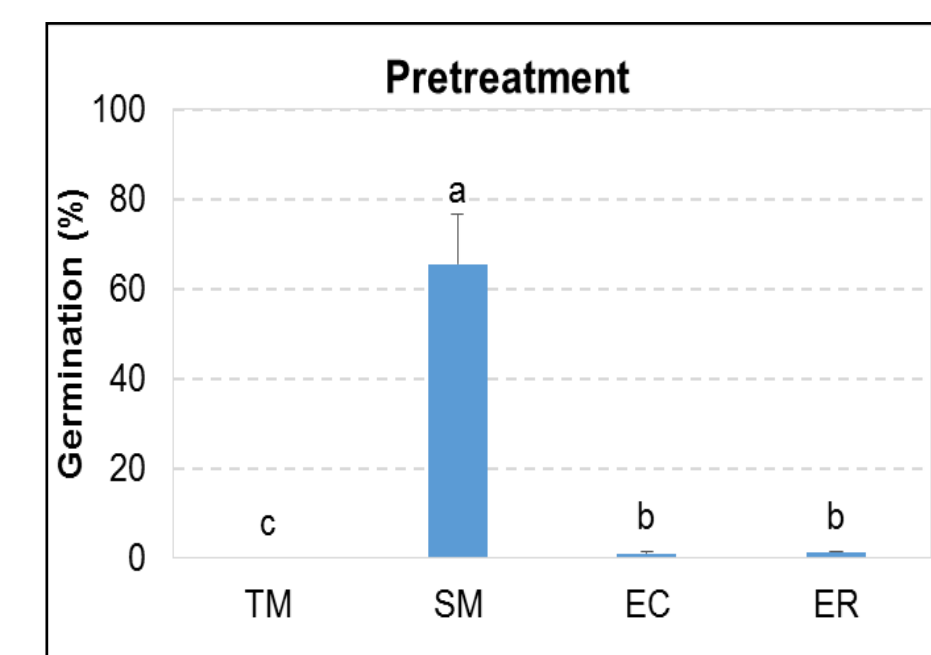
This study allowed to determine and to identify technical itineraries for seedling production.

- ⇒ Manual scarification of seeds gives the highest germination rate for all species.
- ⇒ Large and medium sized seeds have a better germination capacity.
- ⇒ Mixed soil is the most favourable substrate for germination.
- ⇒ *Delonix floribunda* and *Tetrapterocarpon geayi* do not tolerate high level of salinity in water and soil.
- ⇒ *Acacia bellula* tolerates salinity in water and soil.

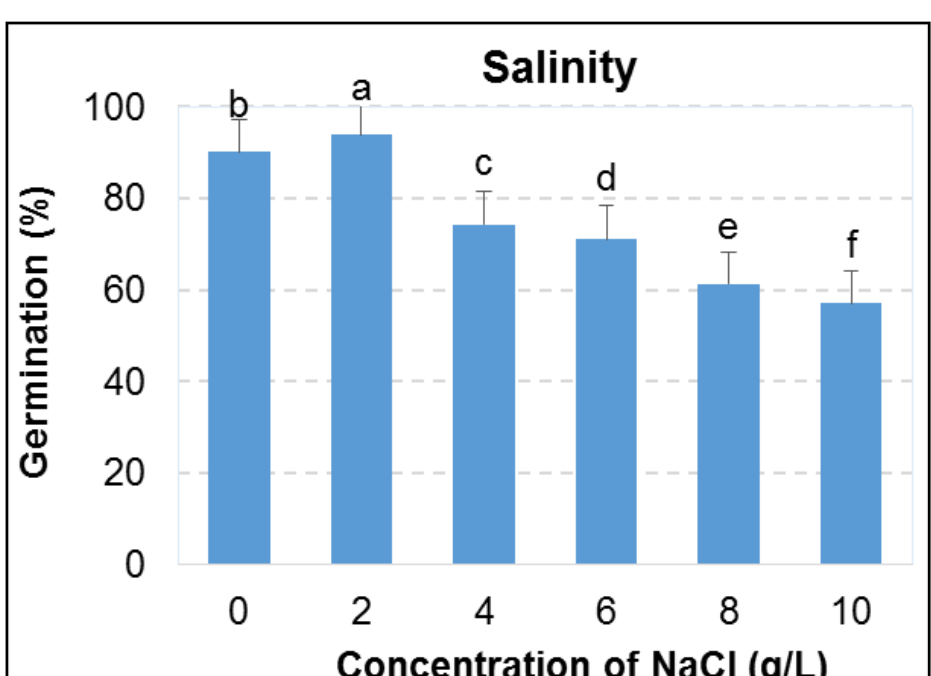
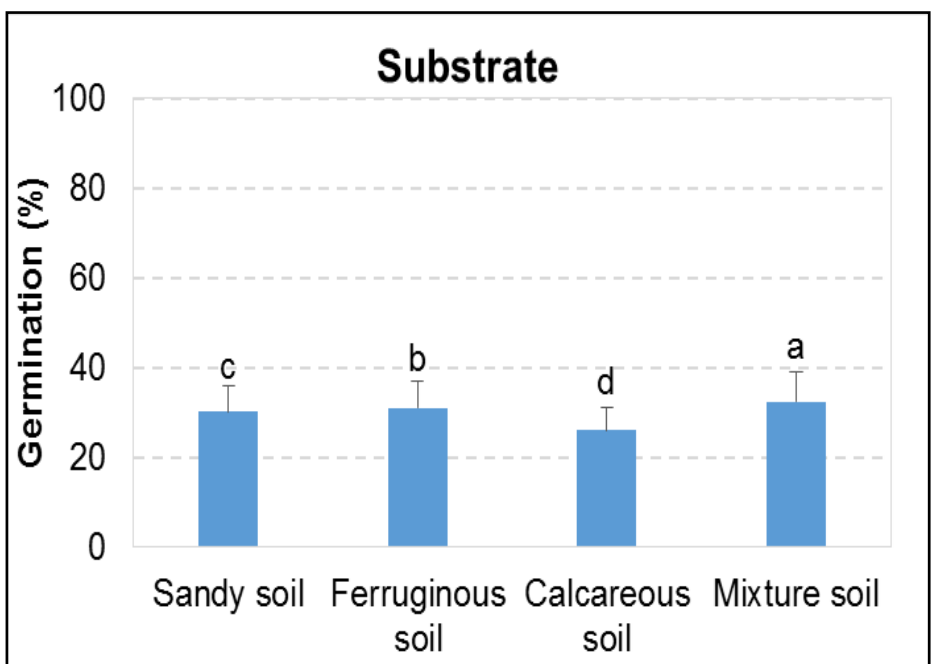
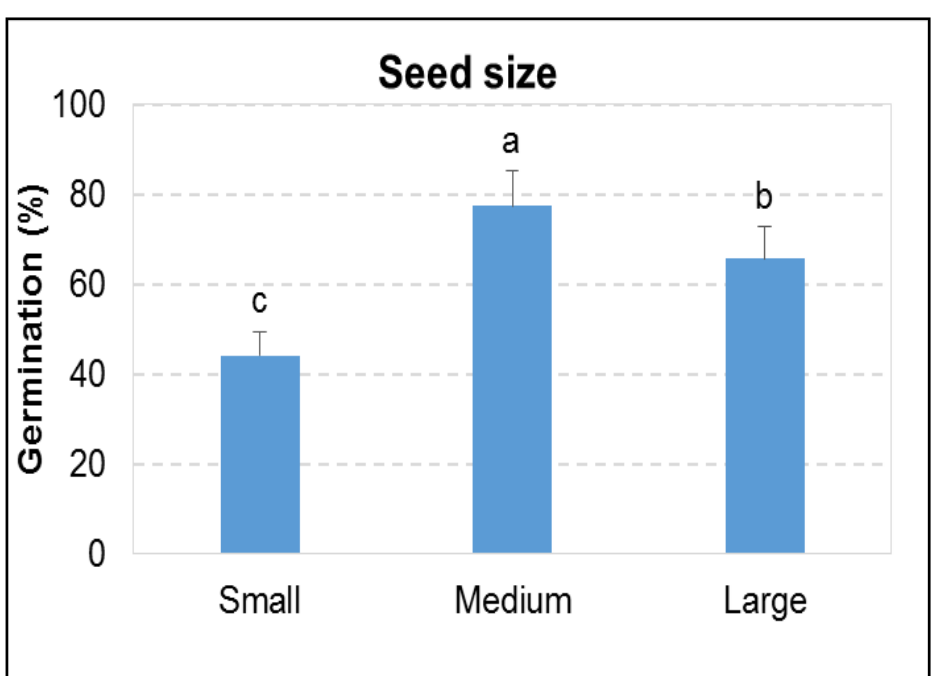
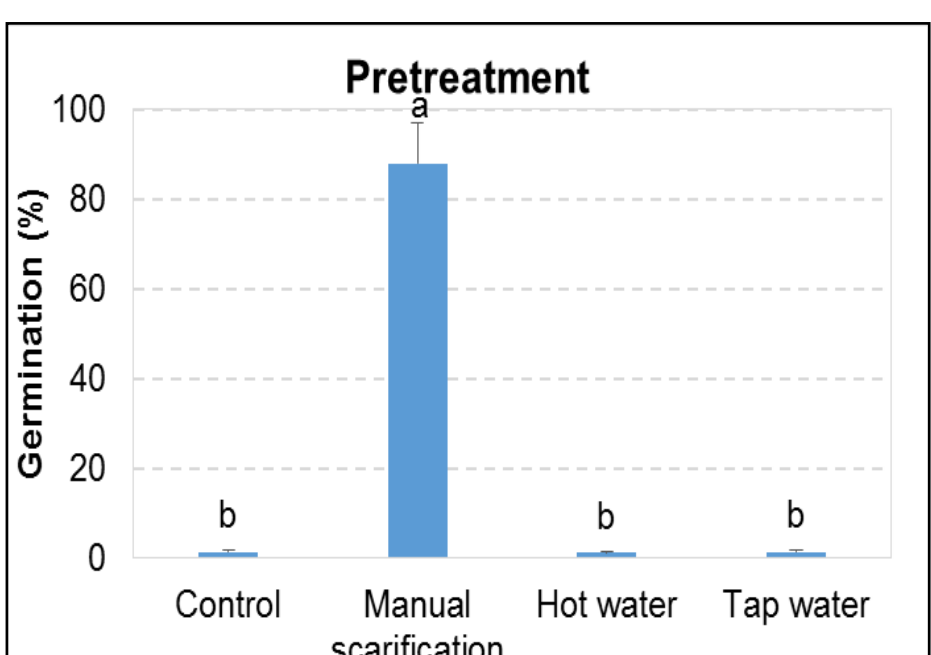
#### *Acacia bellula*



#### *Delonix floribunda*



#### *Tetrapterocarpon geayi*



**Figure 6 :** Effects of treatments on germination rate