Soil Protozoa diversity at coal post-mining area at different age of reclamation

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Introduction

- Soil is the main store of carbon on land
- Mining activities can interfere the soil structure and function
- Open cast mining method will change the soil surface and its environment
- The process in soil (below ground) play an important role in the biogeochemical cycle, soil carbon metabolism and the nitrogen cycle.
- The objectives of this study were to assess the diversity of soil protozoa in six different ages of soil reclamation at post coal mining area

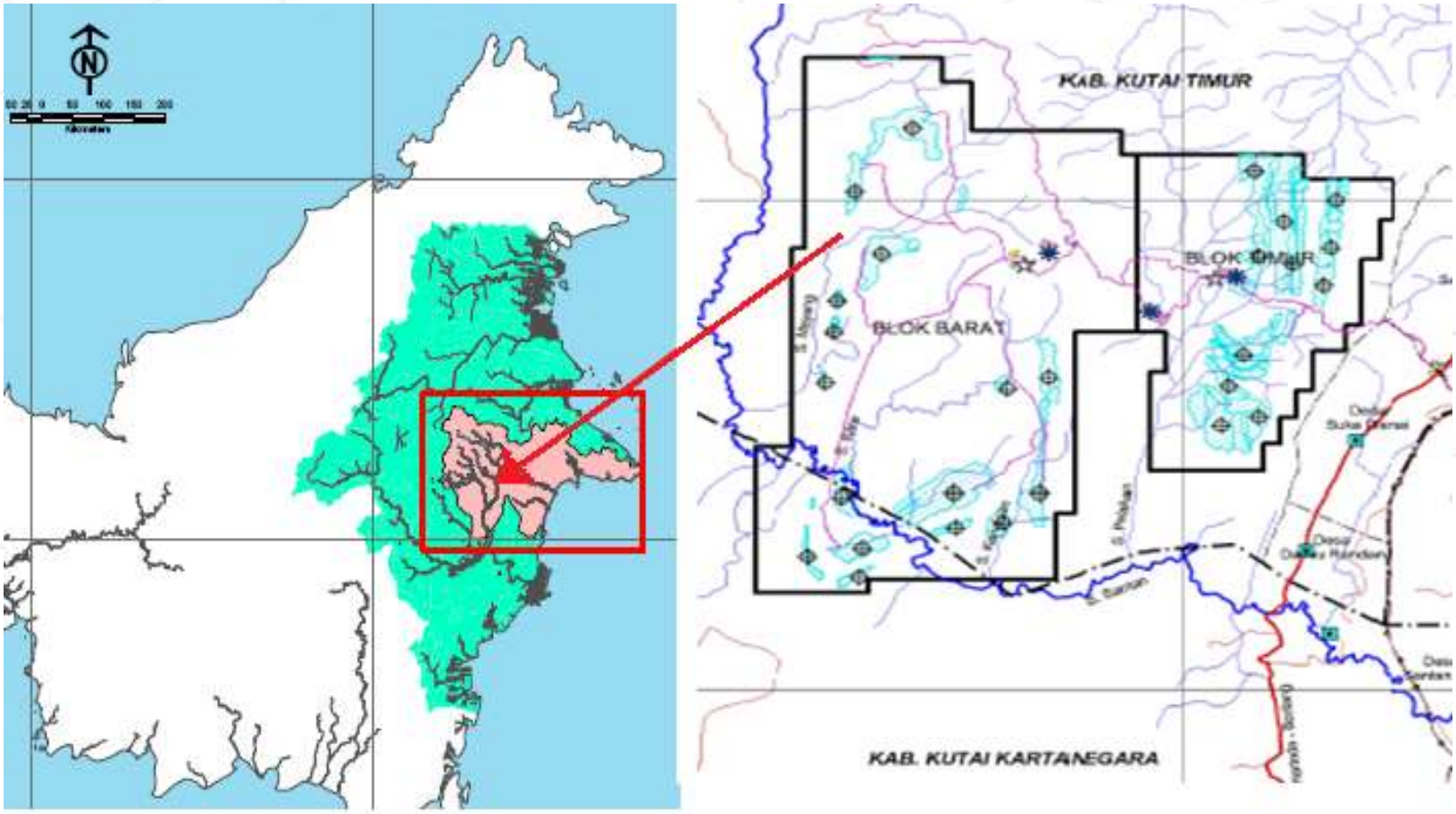
Introduction

Soil Reclamation Process:

Study sites

Kutai District - East Kalimantan
Indonesia

Reclamation area was planted by fast growing trees *Acacia mangium*, *Paraseranthes falcataria* and *Samanea saman*



Methods

- Reclamation of post coal mining area has been done since sixteen years ago.
- Determination of study sites based on treatments (revegetation) and age of reclamation.
- Soil samples were collected from six different age of reclamation (T0, T1, T2, T3, T4, T5 and T6).
- At each site, soil sample was collected from three different plants area (*Acacia mangium*, *Paraseranthes falcataria*, *Samanea saman*).
- Identification of soil protozoa was conducted (following the references) until morphospecies level.

Methods

Protozoa Collection

- Identification and Protozoa analysis (microfauna) based on :
  1. Amoeba and testate amoeba (Smirnov dan Brown (2004)
  2. Flagelata (Adl et al (2005)
  3. Ciliata (Adl et al (2008)

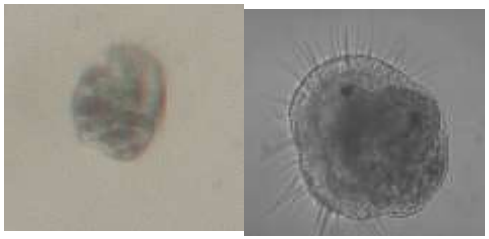
Other references for identification: Lousier and Bamforth (1989), Tikhonenkov et al, (2012), Bass et al., (2009), Ptackova et al¸(2013), Lee et al., (2005).

RESULTS

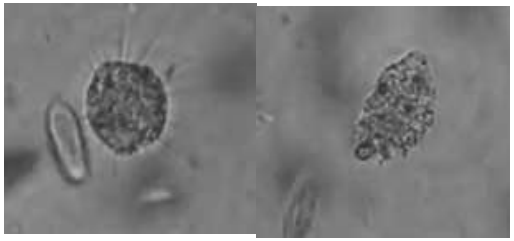
Protozoa diversity at reclamation area

Amoeba	Testate amoeba	Flagellatta	Siliata
Phylum : Sarcodina	Phylum : Amoebozoa	Phylum: Euglenozoa	Phylum : ciliophora
1. Actynophyris sp	1. Heleopera rosea	1. Bodo sp 1	1. Colpidium campylum
2. Heterophrys sp.	2.Heleopera sp.	2. Bodo sp 2	2. Colpoda sp.
	3. Arcella sp.	3. Anisonema ovale	3. Litonotus sp.
Phylum : Flabellinea	4. Nebela sp.	4. Entosiphon sulcatum	4. Blepharisma sp 1
1. Vannella platiypodia	5. Hyalosphenia papilio	5. Peranema trichophorum	5. Blepharisma sp 2
	6. Hyalosphenia minuta	6. Neobodo designis	6. Blepharisma sp 3
Phylum : Tubulinea	7. Breviata Anatema	7. Petalomonas sp.	7. Sphaerophyra magna
1. Trichamoeba sp.			8. Spathidium spathula
2. Hartmannella sp.	Phylum : Cercozoa	Phylum: Cercozoa	9. Vorticella similis
3. Hartmannella Vermiformis	1. Cyphoderia sp 1	1. Cercomonas sp 1	10. Leptopharinx sp.
	2. Cyphoderia sp 2	2. Cercomonas sp 2	11. Didinium sp.
Phylum : Percolozoa	3. Euglypha cilliata		12. Halteria Grandinella
1. Vahlkampfia russeli	4. Euglypha compressa	Phylum: Choanozoa	13. Keronopsis muscorum
	5. Trinema sp	1. Salpingoeca sp.	

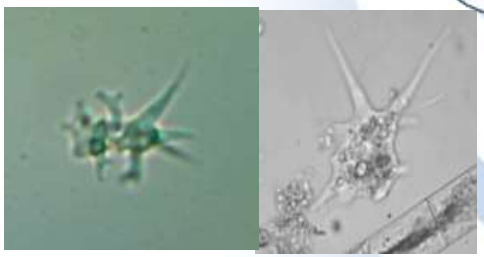
Protozoa at reclamation area



Actynophyris sp



Heterophyris sp.



Vannella platiypodia

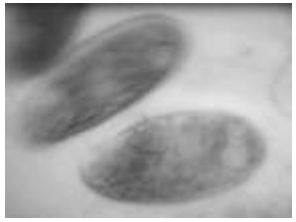
Trichamoeba sp.

Hartmannella sp 1

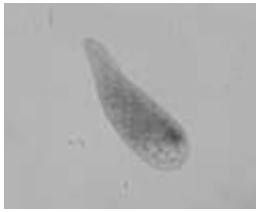
Hartmannella sp 2.

Peranema trichophorum

Neobodo designis



Colpidium campylum



Litonotus sp

Blepharisma sp3

Spathidium spathula

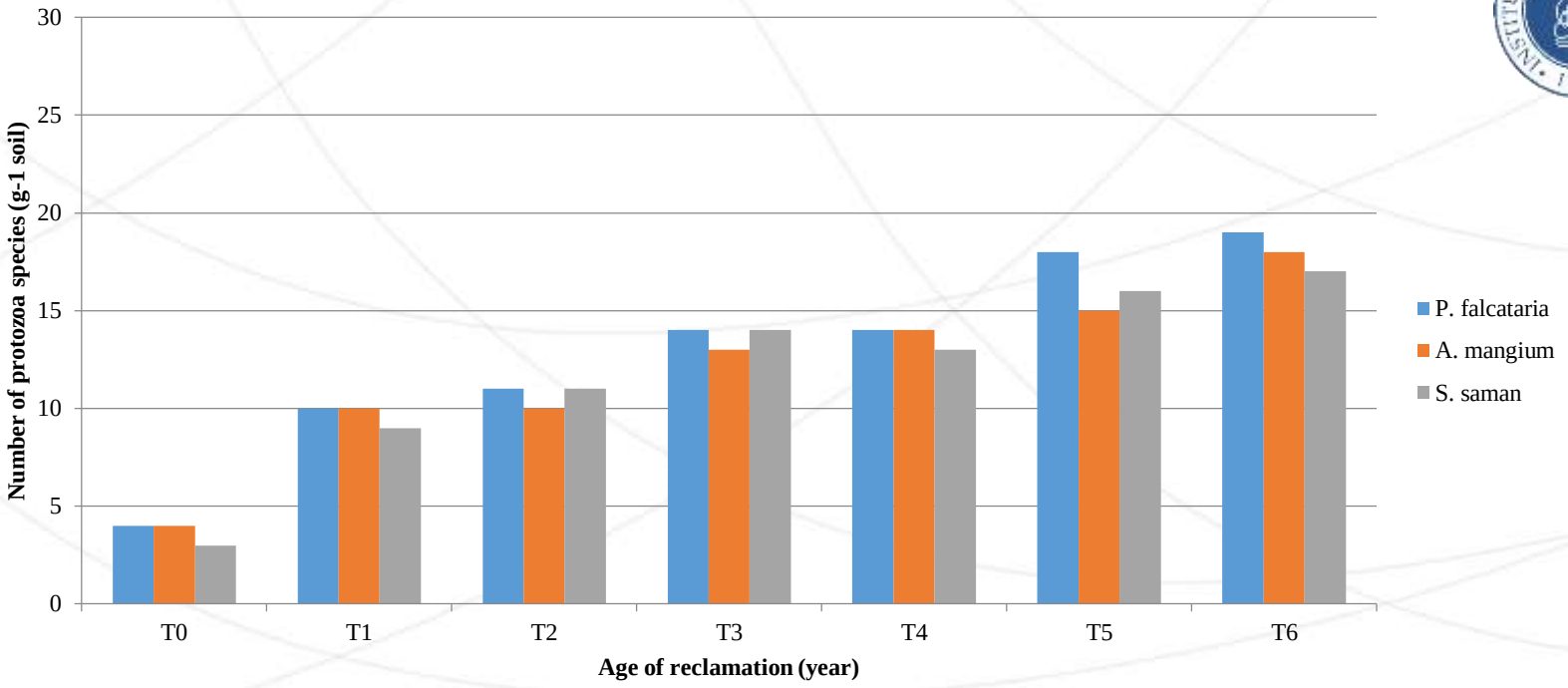
Didinium sp

Tachymonas sp.

Keronopsis muscorum

Vorticella similis

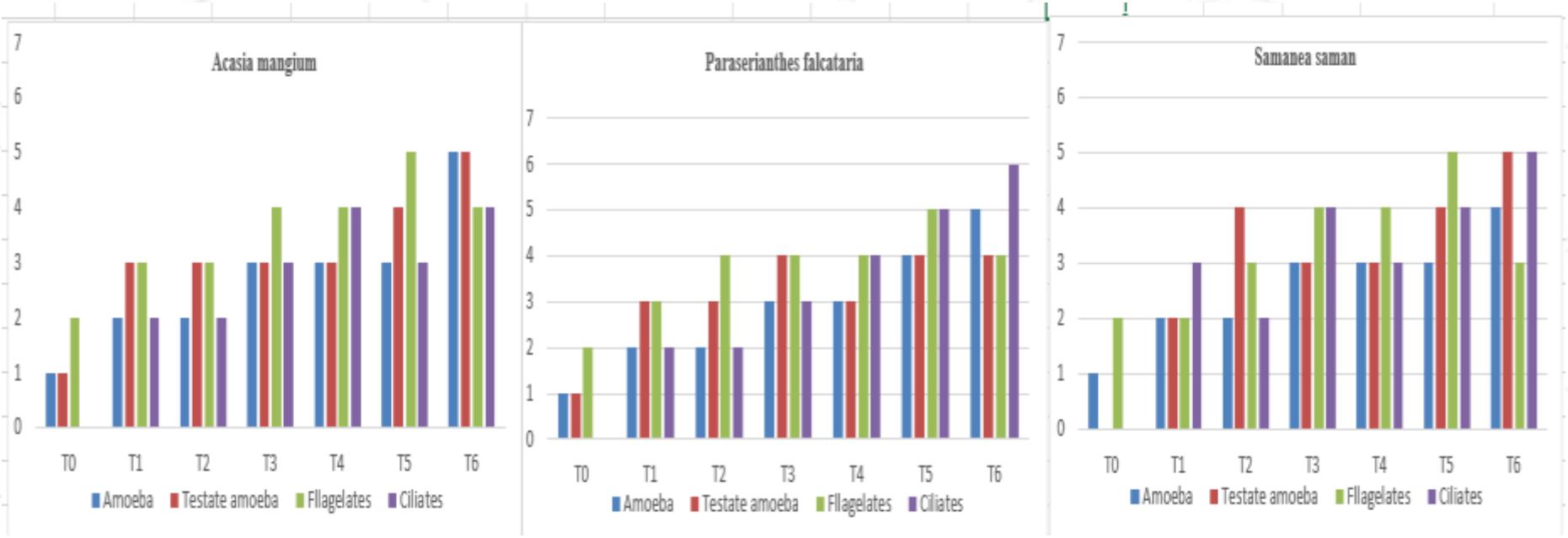
Colpoda sp



The occurrence of protozoa at different area of trees and age of reclamation

(*Acasia mangium*, *Paraserianthes falcataria* and *Samanea saman*)

The occurrence of protozoa at different area of reclamation planting by three species of trees



The abundance of flagelata > amuba > testate amuba > siliata.

Conclusions

- After six year of reclamation, 43 species of protozoa found in the reclamation area.
- In the area of fast-growing tree (*Acacia mangium, Paraserianthes falcataria* and *Samanea saman*) the number of protozoa tend to increase by the increasing the age of reclamation.

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