

Diversity of insects in various types of forest near Yangambi with special attention to the hybotid flies (Diptera: Hybotidae)

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Objective

COBIMFO (**C**ongo **B**asin **I**ntegrated **m**onitoring **f**or Carbon Mitigation and Biodiversity – a BELSPO financed programme)

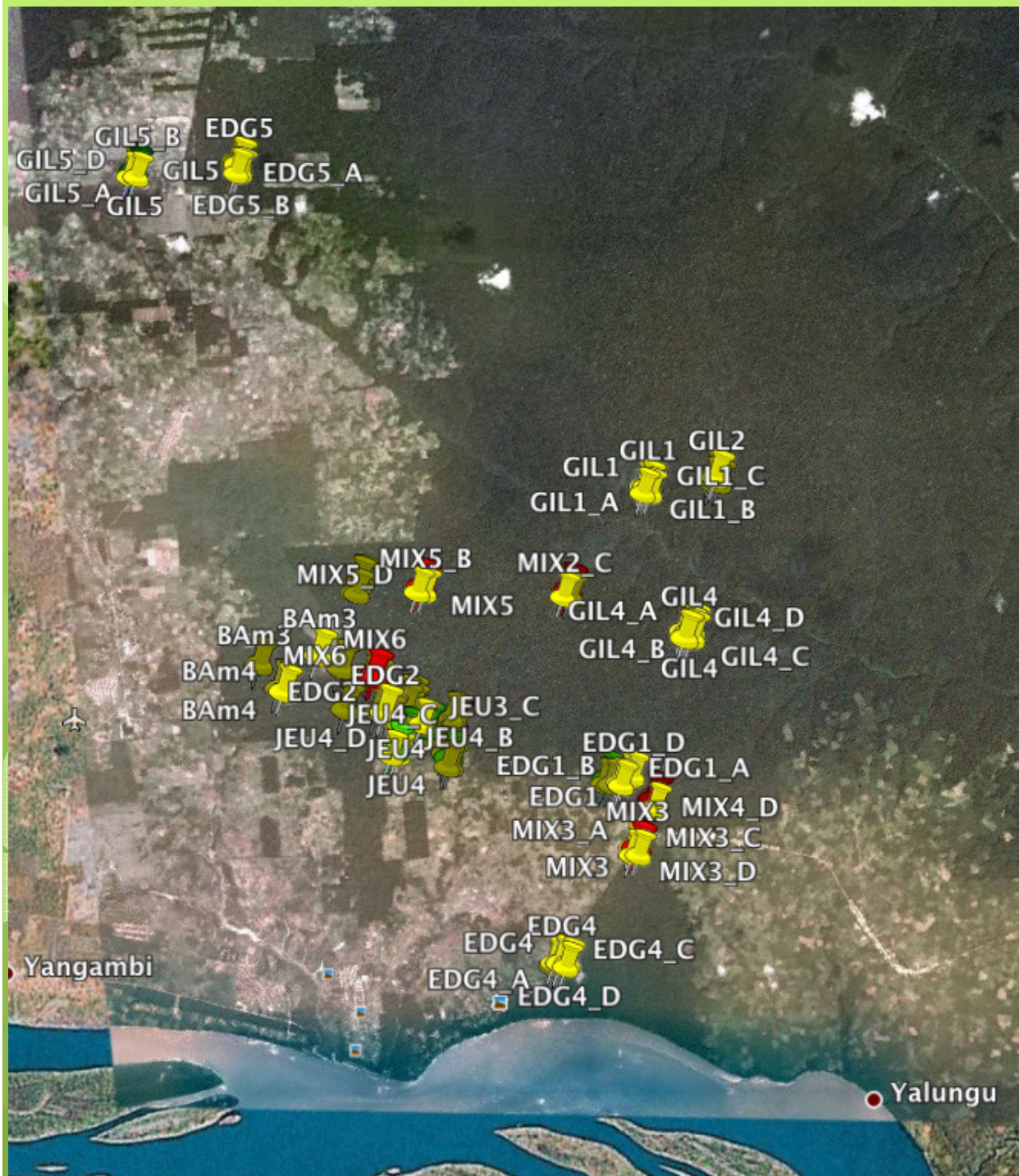
Relation between Carbon fixation and species diversity

In other words:

the relationship between the insect diversity to the various types of forest in the region of Yangambi:

Young and secondary forest versus primary forest





Yangambi

Experimental plots:

100 x 100 m

MIX ... primary

JEU ... young

GIL ... Gilbertiodendron

Bam ... Brachystegia

EDG ... edges

Bam ... bamboo

Other human altered habitats

Inventory of plants
(trees), birds, rodents, ..
insects

Insects as indicators



- **xylophagous** Termites (Isoptera)
- **predators - herbivores:** ants (Hymenoptera: Formicidae)
- **pollinators** - bees (Hymenoptera: Apoidea: Apidae)
- **fungivores** - fungus gnaths (Diptera: Mycetophilidae)
- **detritivores** - dung flies (Diptera: Sepsidae)
- **Herbivores:** giant silk moths (Lepidoptera: Saturniidae)
- **predators - Empidoid flies**
(Diptera: Hybotidae, Empididae, Dolichopodidae)



Technique

Standardized technique for ecological studies

Malaise traps

Sweep netting
30 min / plot



predators - Empidoid flies (Diptera:
Hybotidae, Empididae, Dolichopodidae)



diverse



predators - Empidoid flies

Empidoidea

- *Empididae* 3,000 species / 213 Afrotropical
- *Dolichopodidae* 7,000 species > 700 Afrotropical
- *Hybotidae* 2,000 species / 148 Afrotropical
-

The taxonomic challenge R.D. Congo:

Before 2010: 4 species known

2010: 32 species: 25 new for science

2012: 41 species: 13 new for science

2013: 104 species: 60 new for science

Total: 115 species (110 new for science)



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3603

The flies of the family Hybotidae (Diptera, Empidoidea) collected during the Boyekoli Ebale Congo 2010 Expedition in Democratic Republic of Congo

PATRICK GROOTAERT¹ & IGOR SHAMSHEV²

32 species of Hybotidae were collected in humid secondary forests along the Congo river (Yaekela - Kona). 25 species are described as new for science.



predators - Empidoid flies

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New Tachydromiinae (Diptera: Empidoidea, Hybotidae) from different types of forests near Yangambi

Patrick Grootaert & Igor Shamshev, 2014

Belgian Journal of Entomology 18: 1-34.

Tachydromiinae or 'Fast running flies' were collected in **June 2012** in a gradient of forests types ranging from garden patches, bamboo, over young forest to mixed primary and monodominant (*Gilbertiodendron*) forest.

Keys have been improved to contain all 44 species known from the region around Yangambi. Most species have been barcoded for COI.

predators - Empidoid flies

Empidoidea

- *Empididae* 3,000 species / 213 Afrotropical
- *Dolichopodidae* 7,000 species > 700 Afrotropical
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The taxonomic challenge R.D. Congo:

Total: 115 species (110 new for science)
known from Oriental province
or 75% of the actual known Afrotropical fauna

We challenge Ashley Kirk-Spriggs: rich savannahs, poor forests (chapter In: *Diptera Diversity: status, challenges and tools*, 2009)

The taxonomic challenge R.D. Congo:

The genus *Elaphropeza*

Most diverse and abundant genus



Descriptive techniques

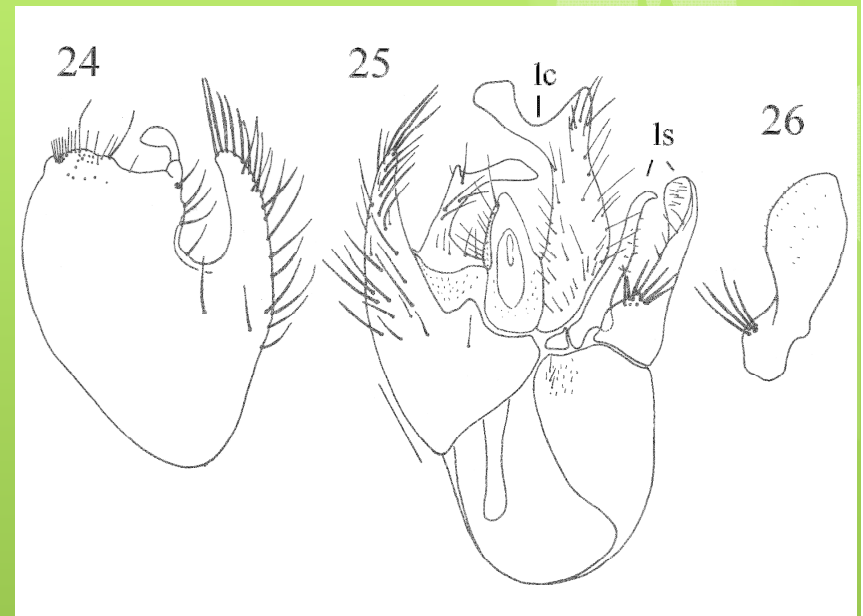
Key characters: colours head, thorax, legs, bristling

Sclerotisation abdomen, glands



Descriptive techniques

Male genitalia

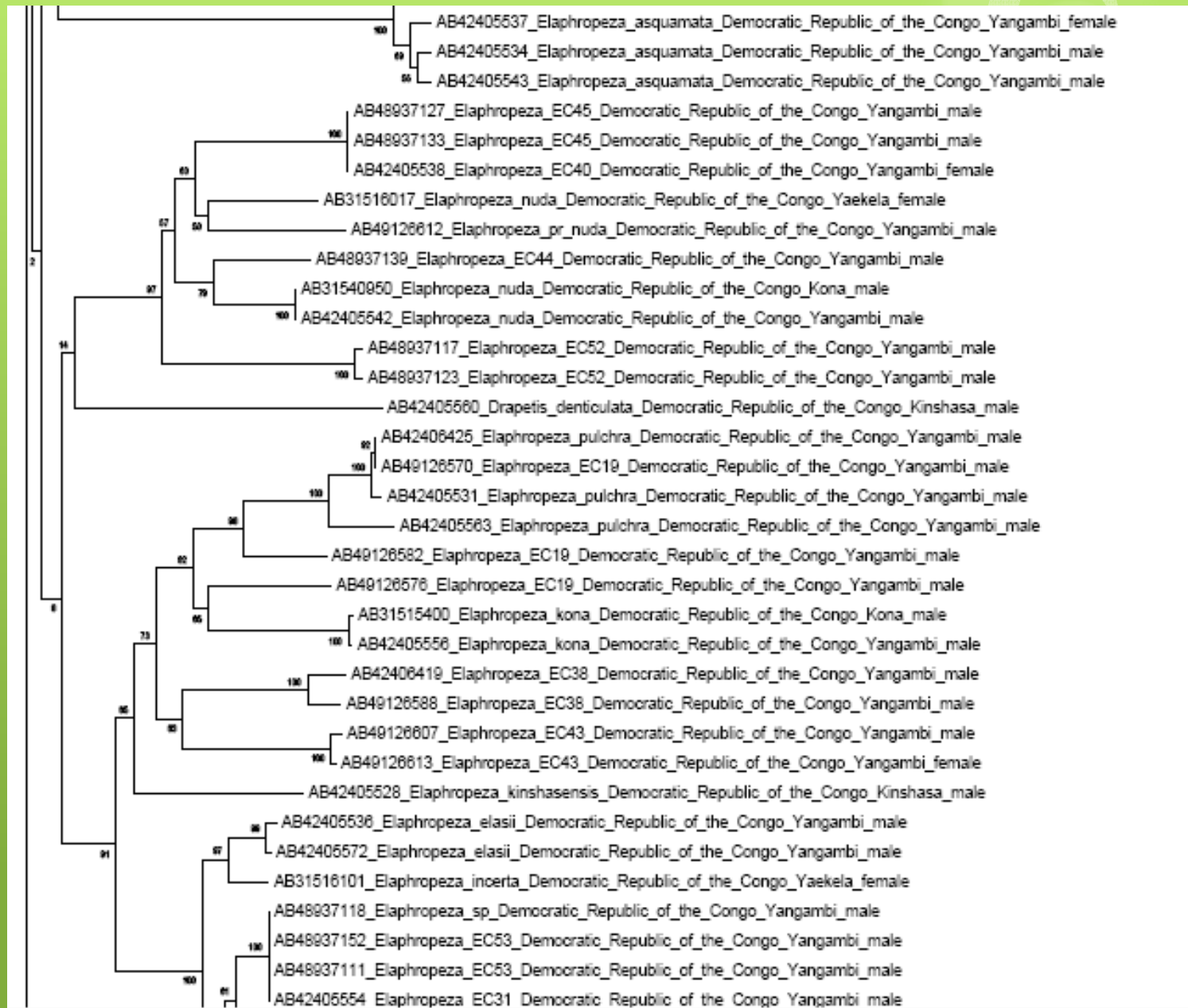


Barcoding

Almost all species done (3 specimens) even females

Description is time consuming process

COI barcodes



Preliminary results of the **2013** collection
at Yangambi

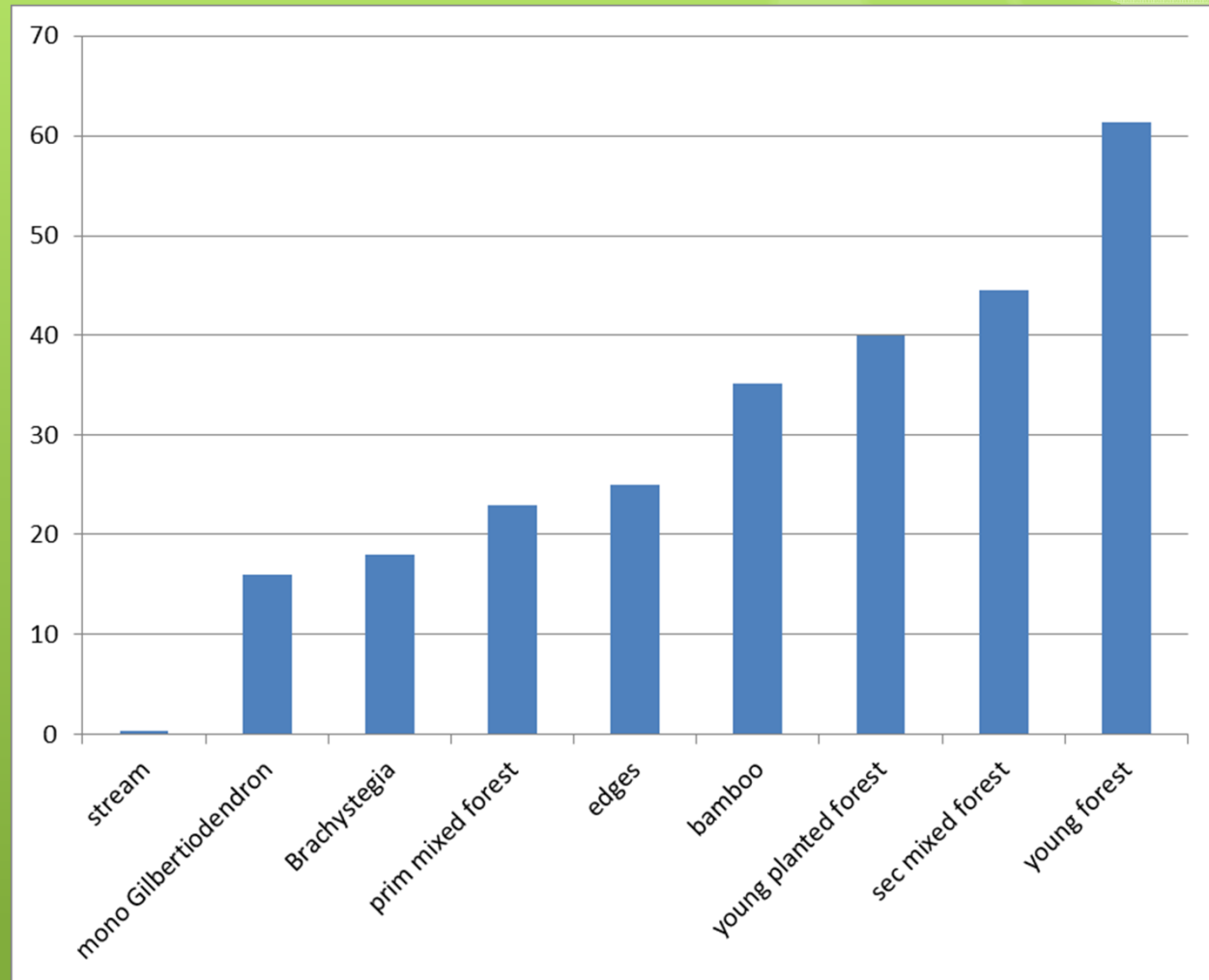
1,045 hybotid specimens
belonging to 104 species

Only 16 represented by > 20 individuals

In matrix

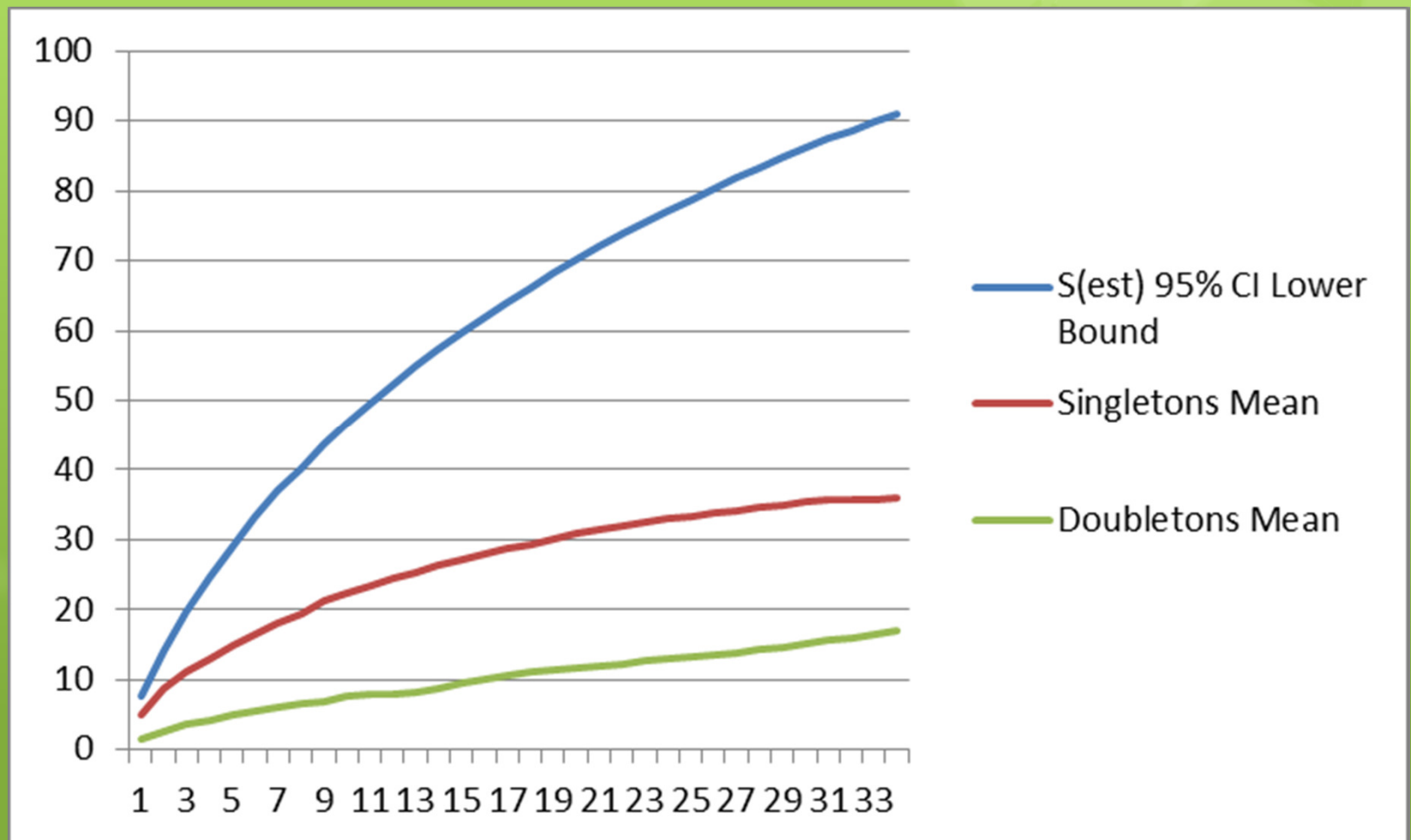
Singletons: 38
Doubletons: 14

Density:



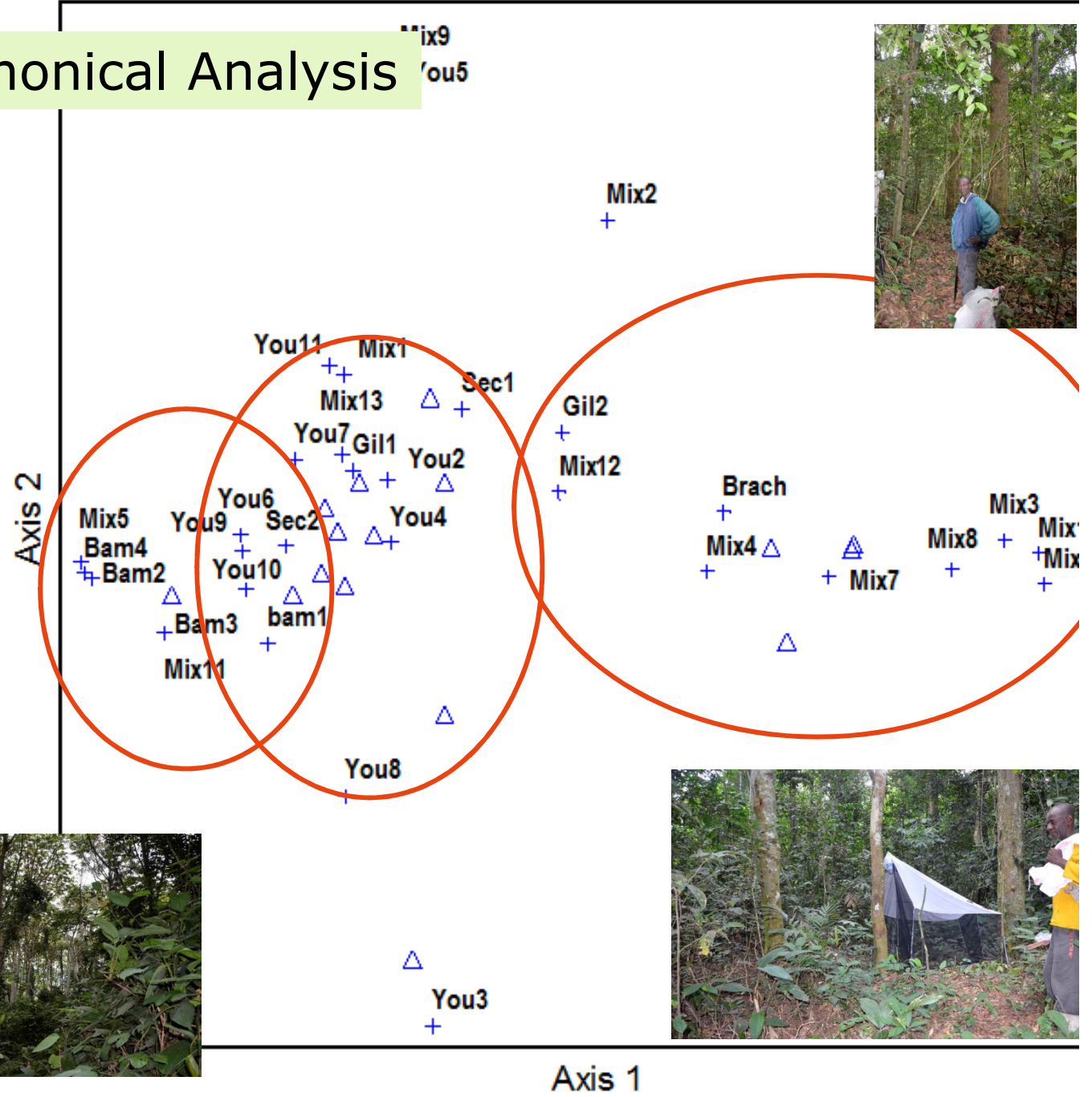
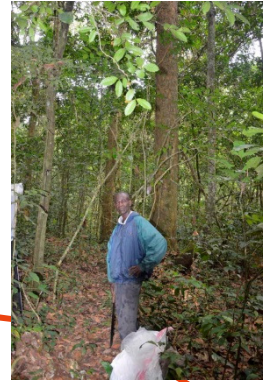
Species accumulation curve: 34 samples,
1045 individuals
Yamgambi 2013

EstimateS Win9.1.0 Colwell, 2013

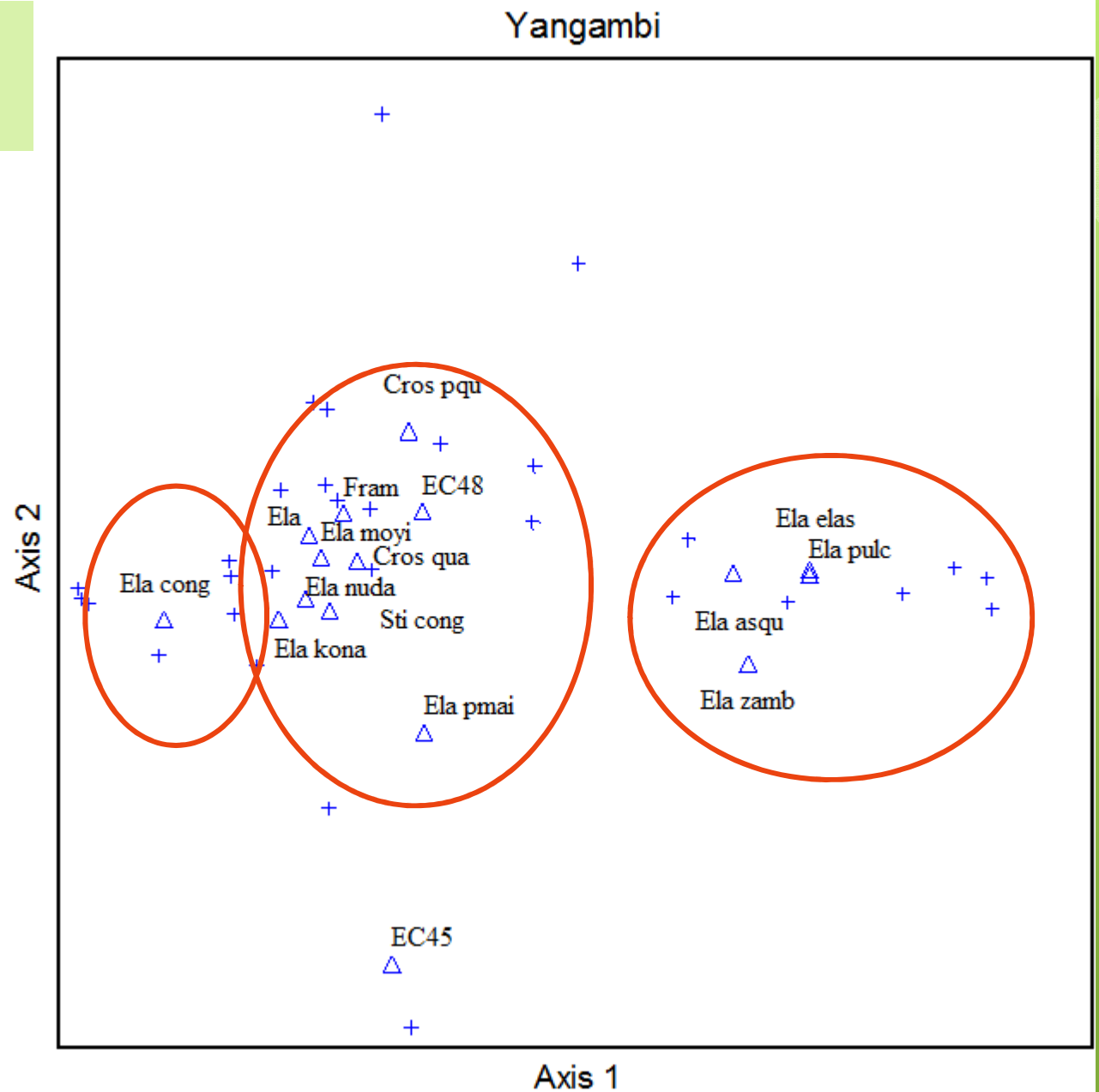


Detrended Canonical Analysis

sites



Indicator species for sites



Conclusions

Indicator species for the sites: mixed primary forest, secondary forest, young forest and anthropogenic habitats (bamboo)

Working hypothesis confirmed

Few specimens but very diverse in primary forest
Higher density and as diverse in young forest probably due to the presence of understory and high diversification in vegetation structure.

Huge diversity

Taxonomic challenge – a lot to do

Our preliminary results only the start

The challenge is up to yours

Thank you



Stilpon sp