Deciphering the function and evolution of the centromeric repeats in Primates

Sarah Kaddah

Tuteur: Loic Ponger
Département: Régulation, Développement, Diversité Moléculaire
Unité: Structure et Instabilité des génomes
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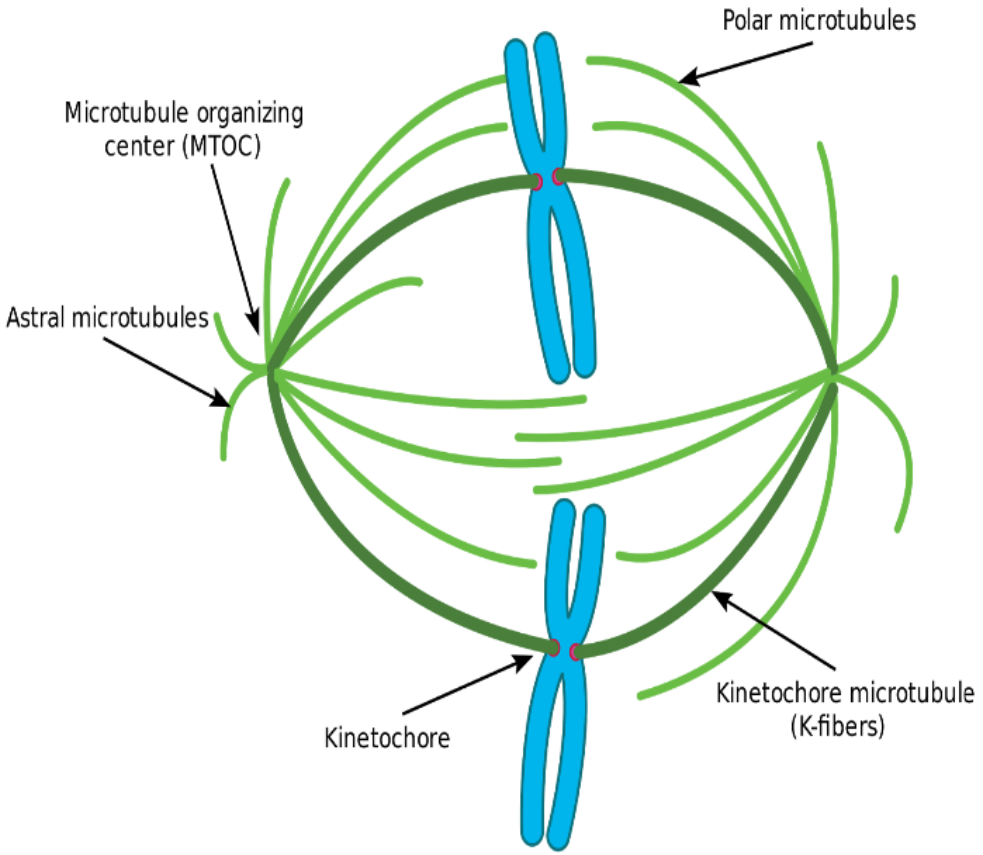
About the centromere

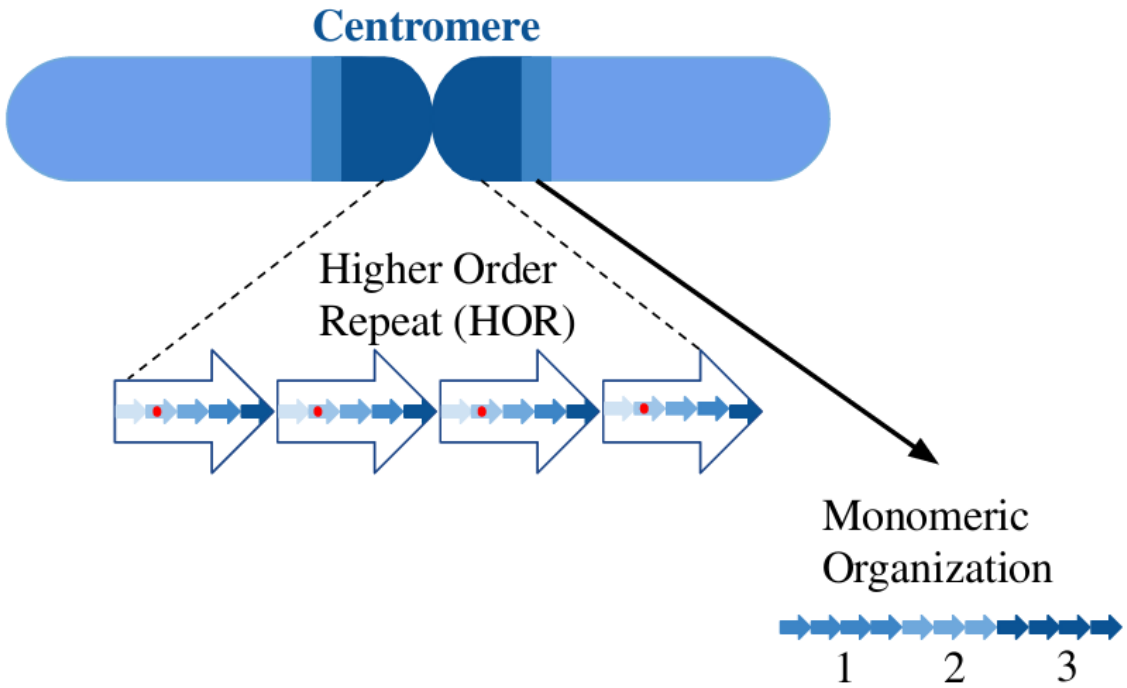
- Chromatin structure
- Cell division
- Conserved proteins
- Not conserved DNA
  - **Satellite DNA**
  - Function ?



Albert et al., 2002

Satellite DNA in Primates

- α-satellite
- 170 pb
- $>$ 70% similarity
- Several families
- Binding sites : CENP-B, pJα
- Specific spatial organisation

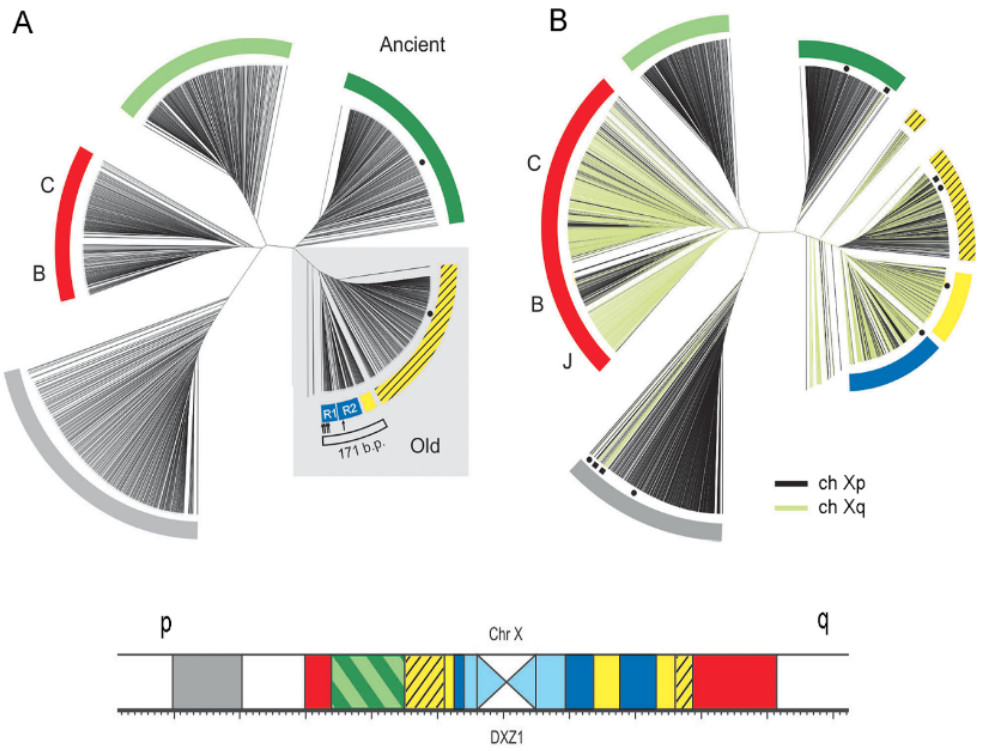


α-satellites DNA

Studies in human :

Phylogenetic analysis of pericentromeric monomers

- Age-gradient hypothesis
- Identification of 5 families



Shepelev et al., 2009

Studies on Gorillas :

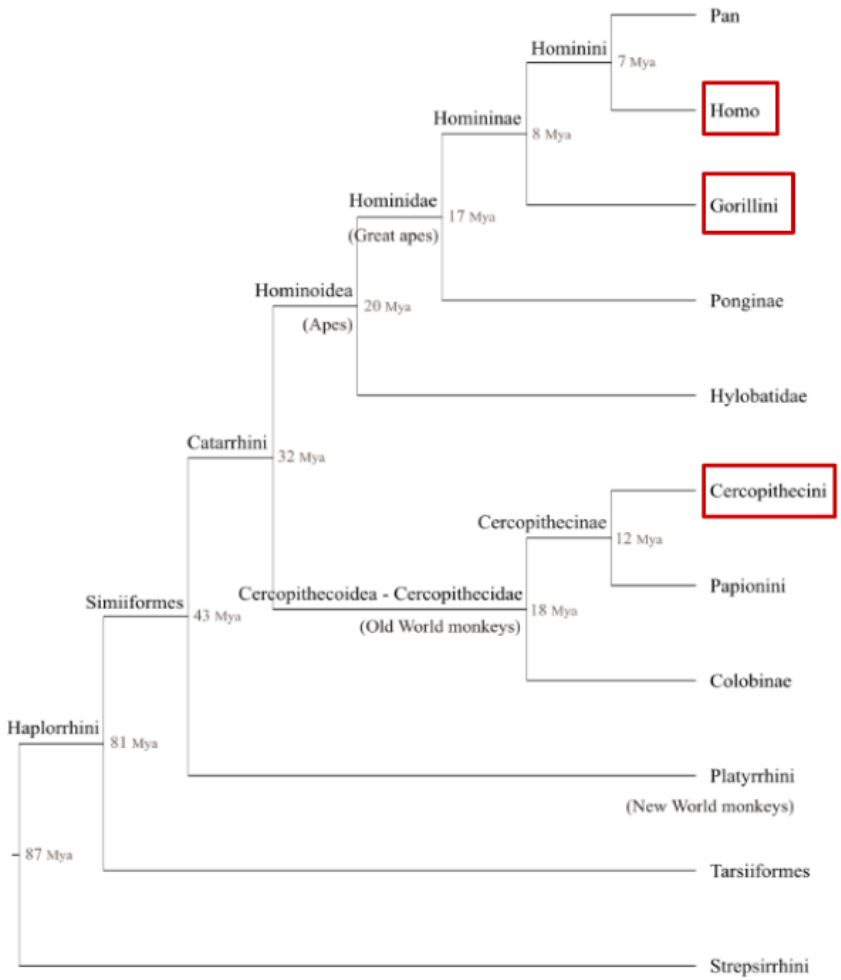
Catacchio et al., 2015

- Medium throughput-sequencing
- Identification of 3 families
- Complex HOR organization
- Binding sites for CENP-B and pJα

Studies on Cercopithecini :

Cacheux et al., 2016

- High throughput-sequencing
- Identification of 6 families
- Binding sites for pJα



Cacheux, Thèse

1- Choose species for analysis

Species	# of α-sat.	Sequencing
Cercopithecus pogonias	112 902	Ion torrent
Cercopithecus solatus	105 529	Ion torrent
Chlorocebus sabaeus	29 842	Illumina
Macaca fascicularis	39 893	LS454
Macaca fascicularis	195 642	Assembly

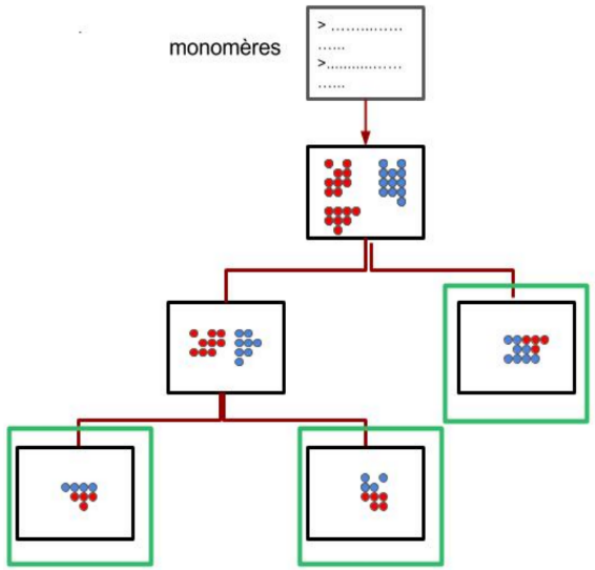
Goals

1- Choose species for analysis

2 - Identify families for each species

A-Method of classification

- Binary classification
- Objective and reproducible method
- Process big amount of short sequences



Jornod,2017

Goals

1- Choose species for analysis

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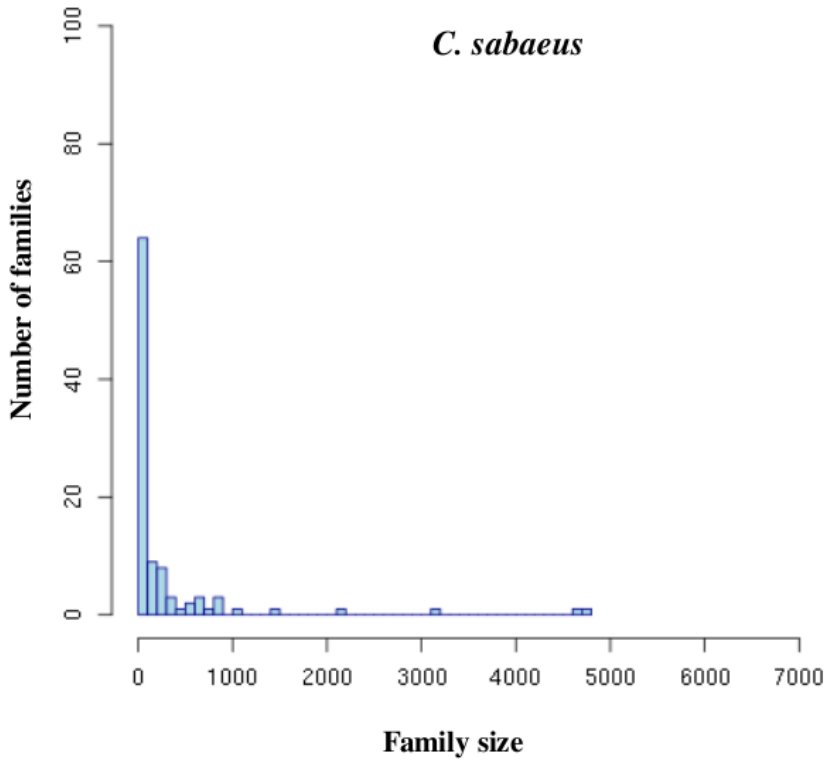
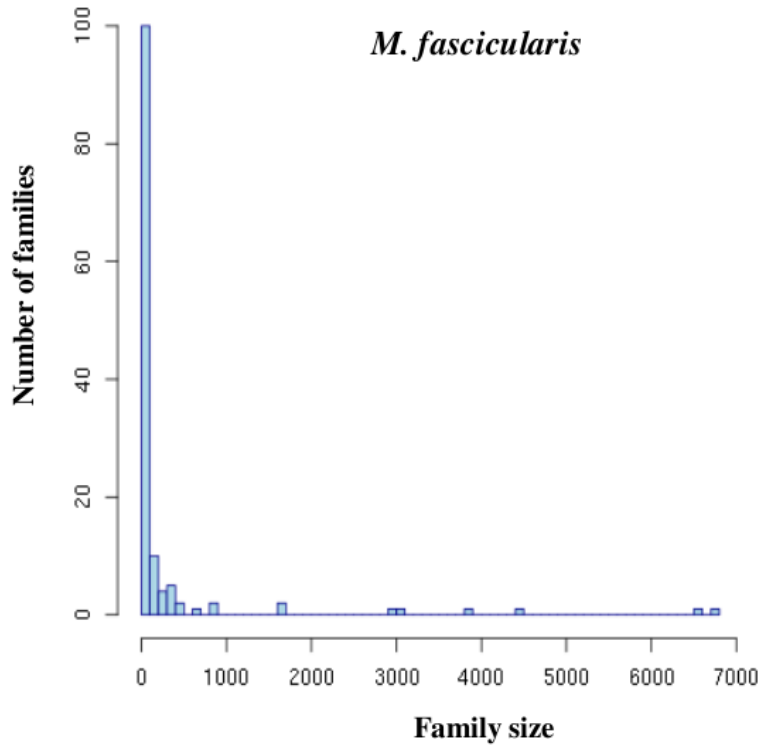
B-Preliminary results





1- Choose species for analysis

2 - Identify families for each species

B-Results

	C. sabaeus	*M. fascicularis*
#Families	100	132
#Families > 100 sequences	36	32
% Sequences	95,3%	96,6%

Goals

1- Choose species for analysis

2 - Identify families for each species

3 - Characterize families into each species

- binding sites
- percentage of similarity

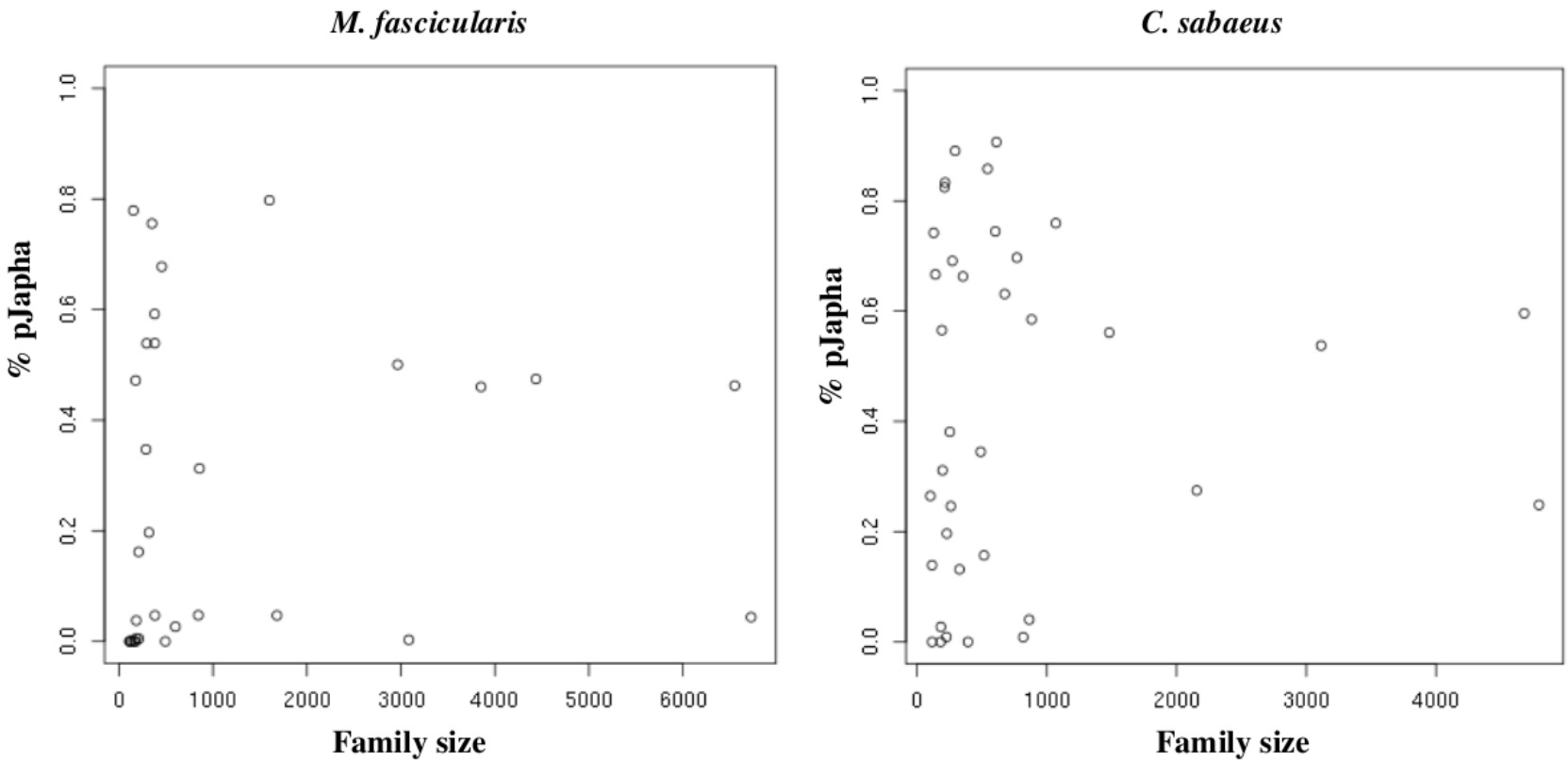
Goals

1- Choose species for analysis

2 - Identify families for each species

3 - Characterize families into each species

A-Binding site



Goals

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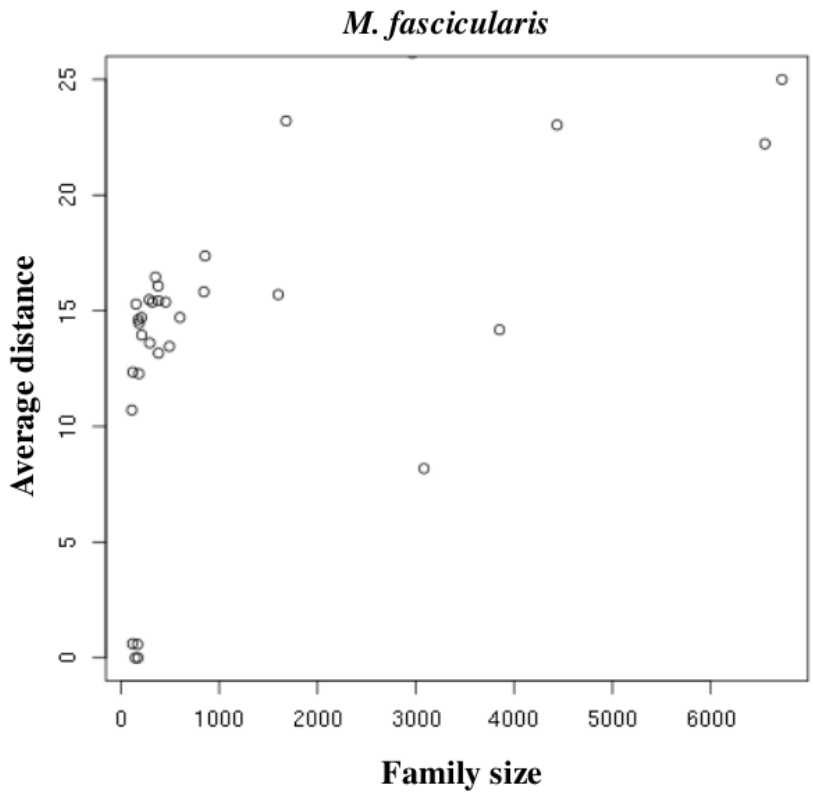
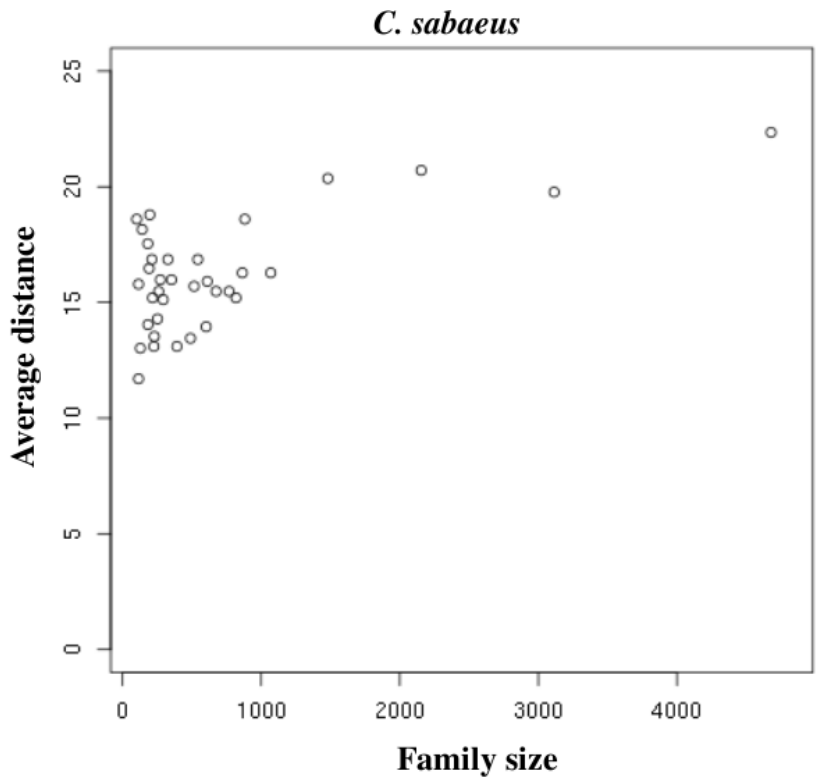
B-Similarity





Goals

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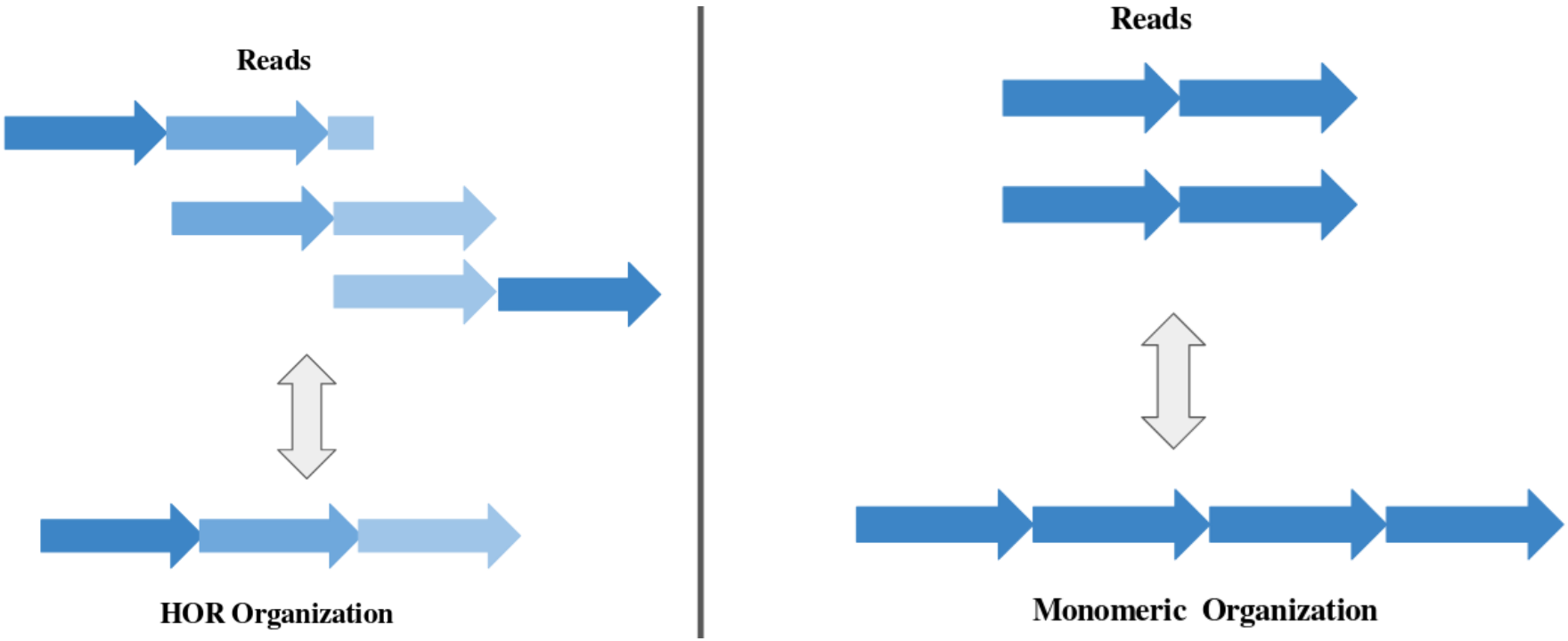
2 - Identify families for each species

3 - Characterize families into each species

4 -1. Spatial organization analysis



Goals

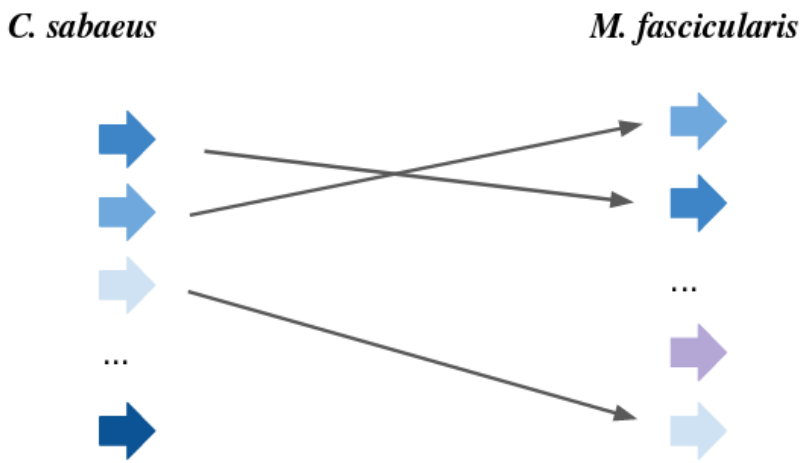
1- Choose species for analysis

2 - Identify families for each species

3 - Characterize families into each species

4 -1. Interspecific comparison

4 -2. Interspecific comparison



Work
in
progress