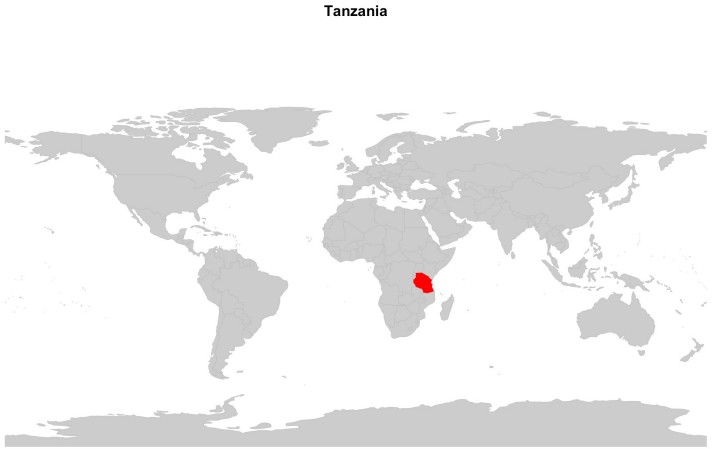
MAGs of Tanzania gut microbiomes

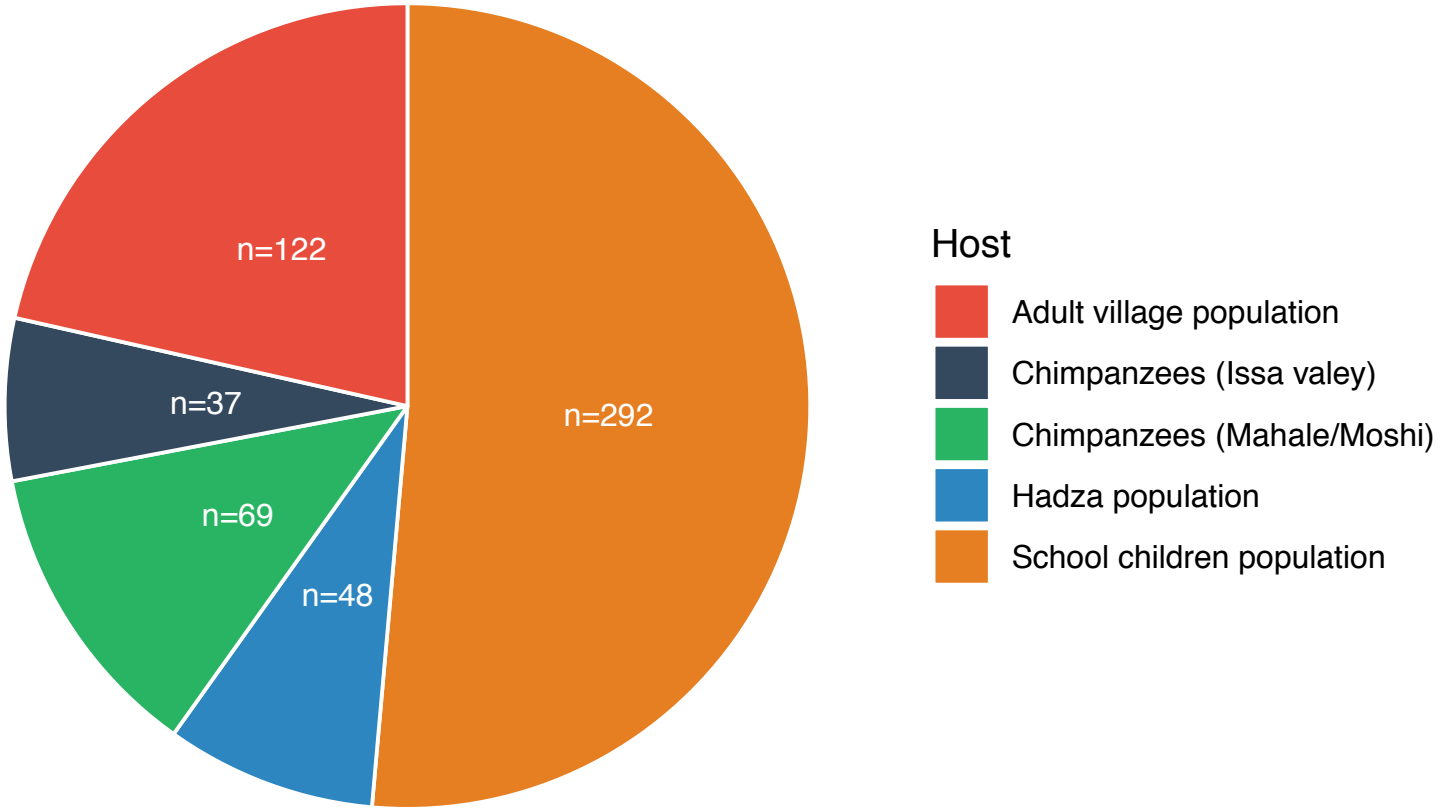
Marie Louise Jespersen

2022.03.28

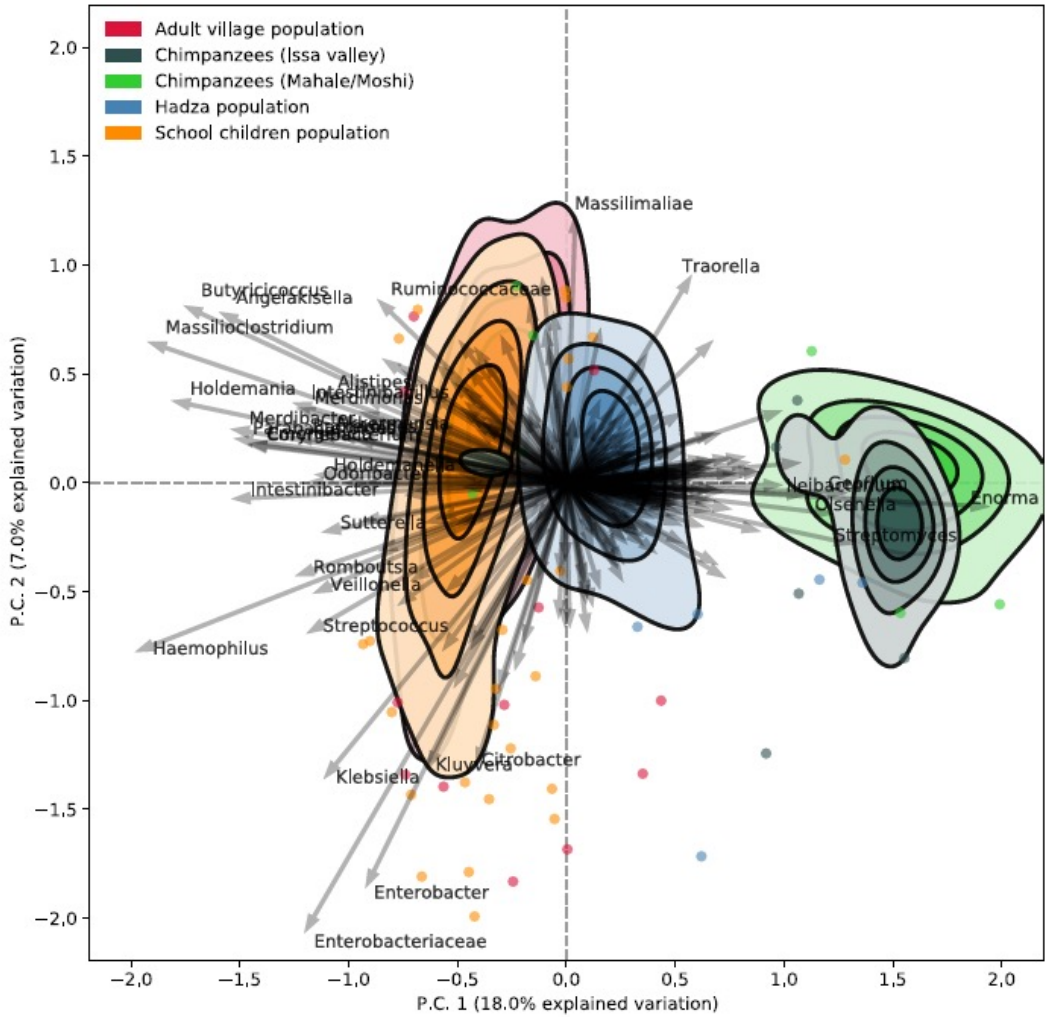
Tanzania data set

568 samples from Tanzania





Read mappings to genomic2_20191017



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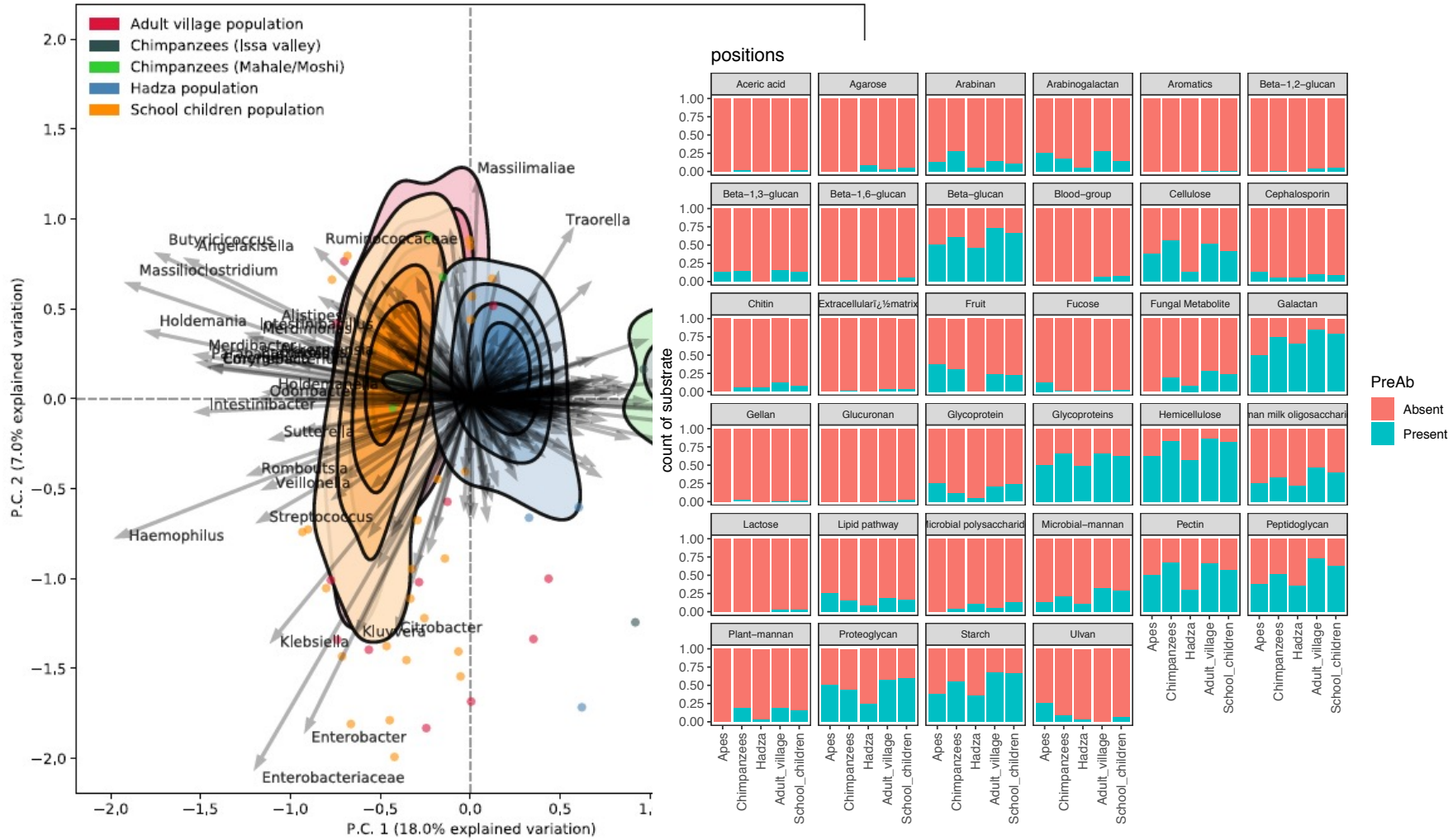
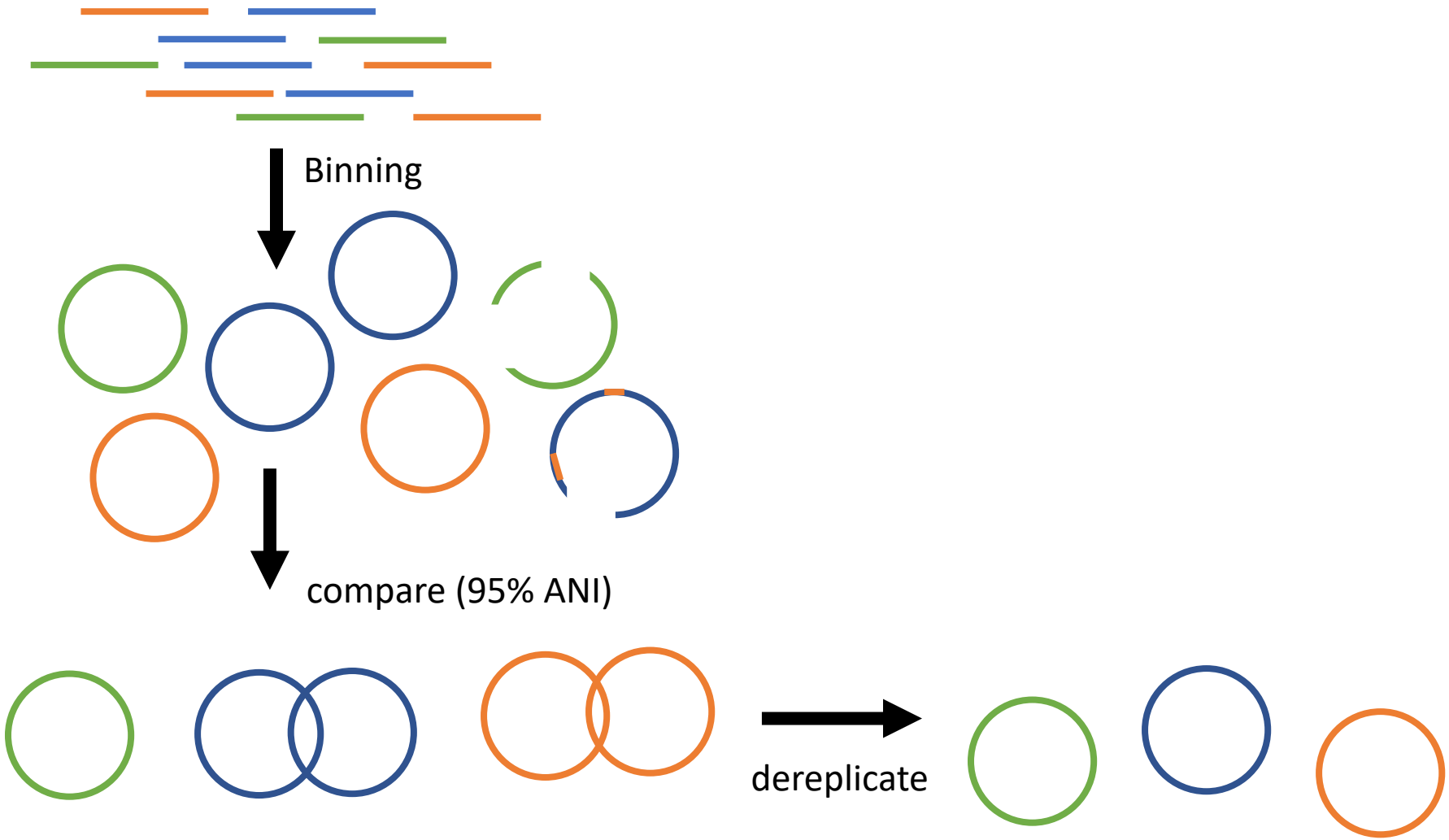


Metagenome-Assembled Genomes (MAGs)



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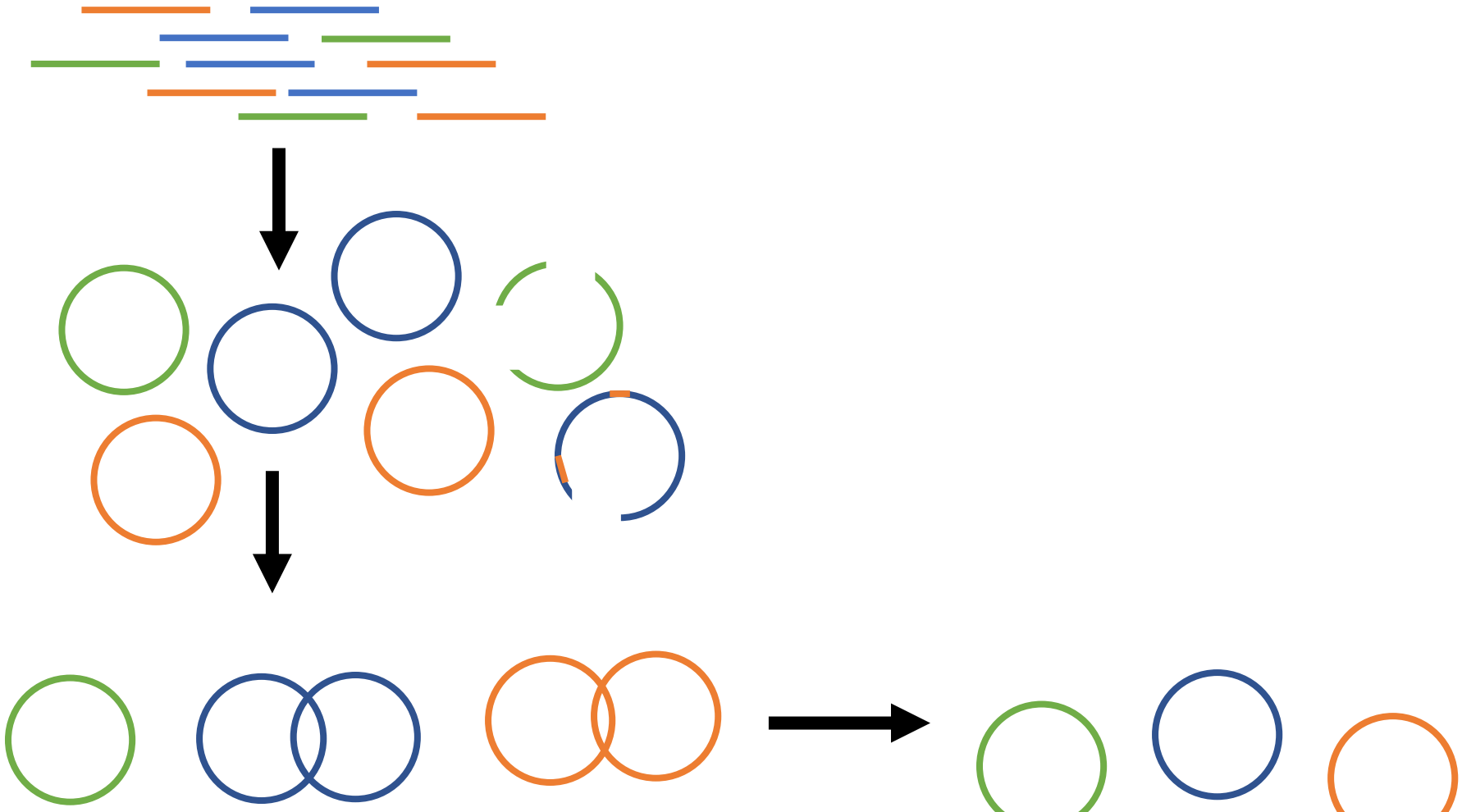
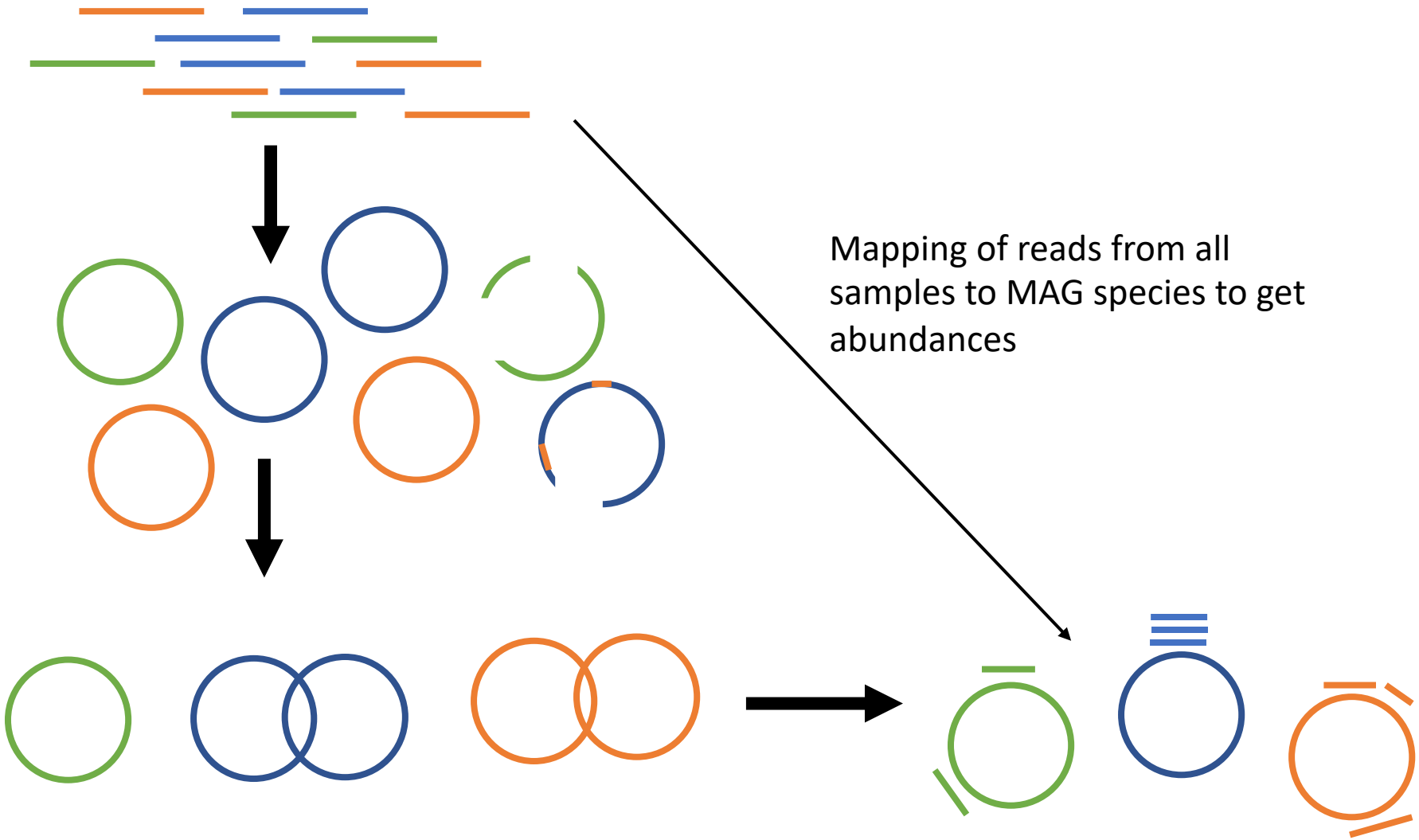


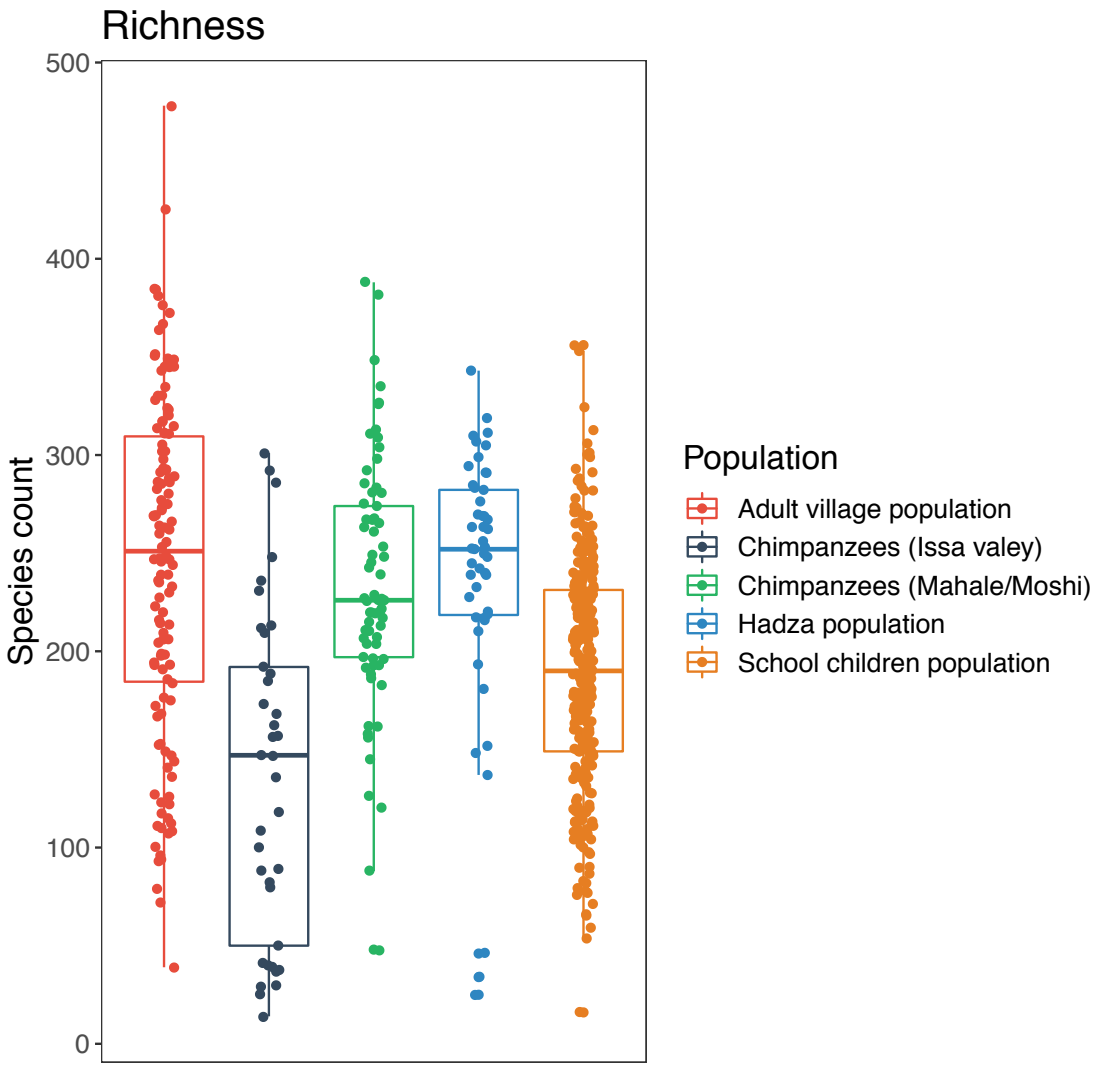
16,062 High quality MAGS

1,625 different MAG species

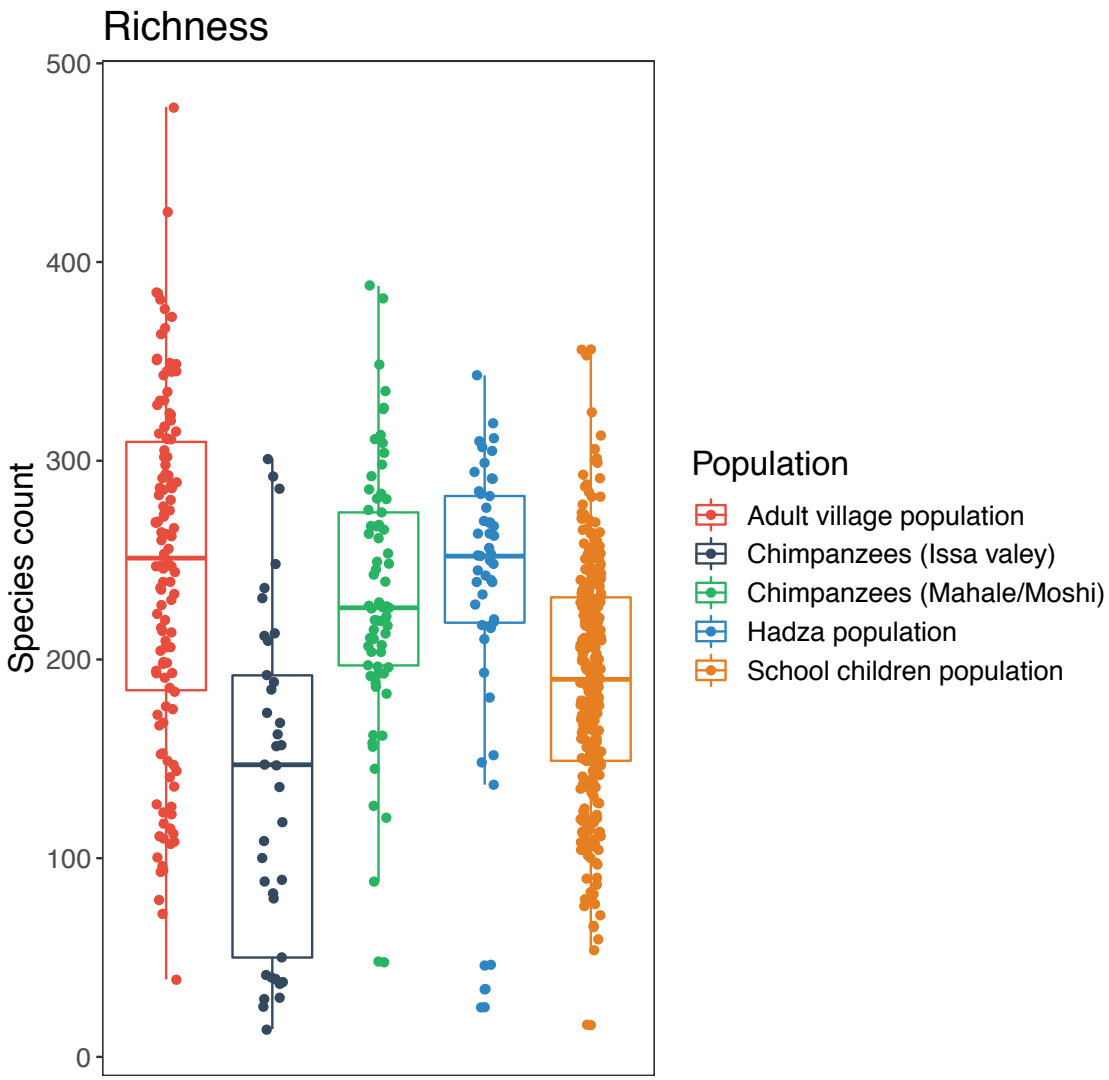
Abundance of MAG Species



Richness


Richness
Species count
500
400
300
200
100
0
Population
Adult village population
Chimpanzees (Issa valey)
Chimpanzees (Mahale/Moshi)
Hadza population
School children population

Richness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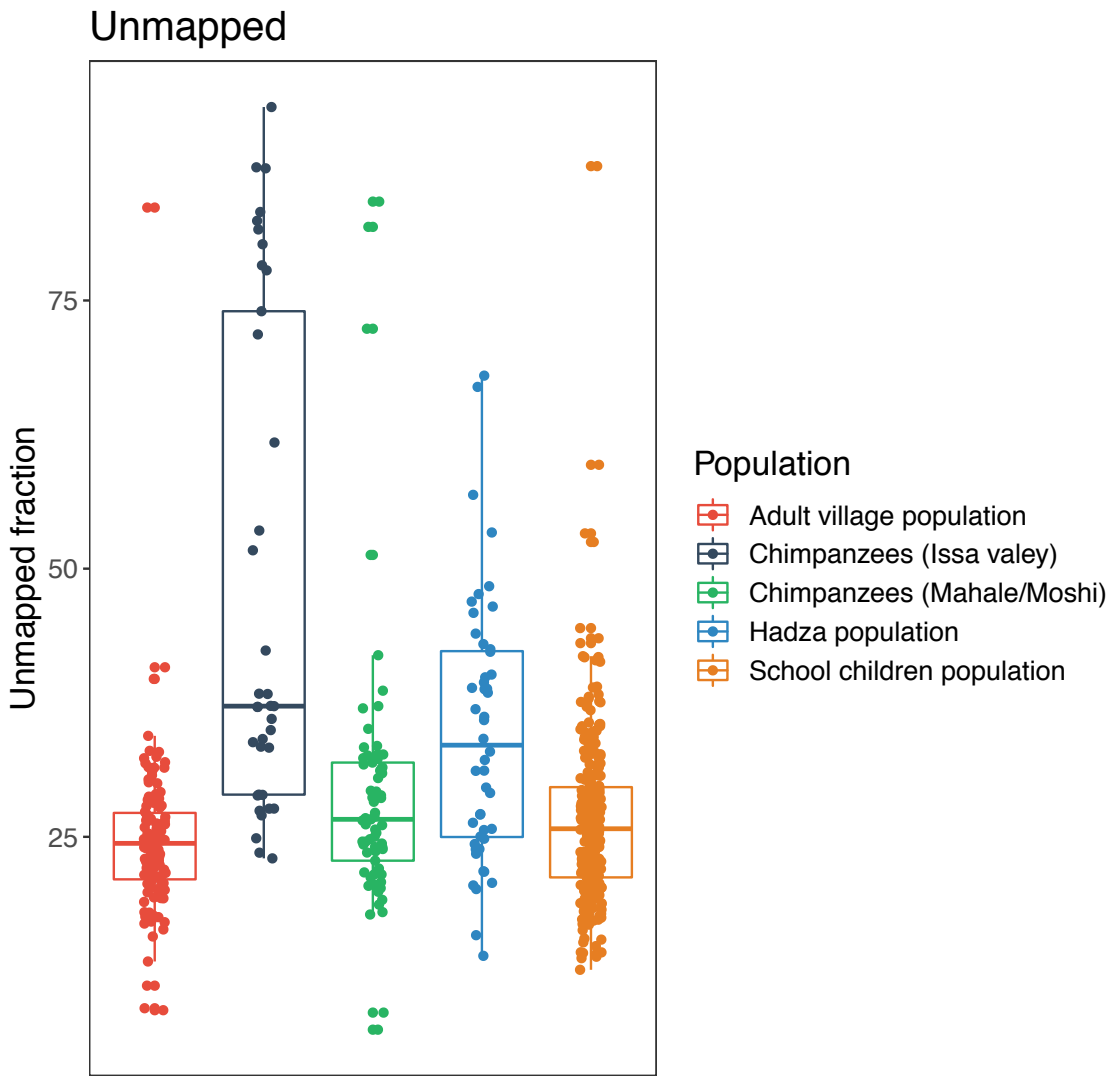
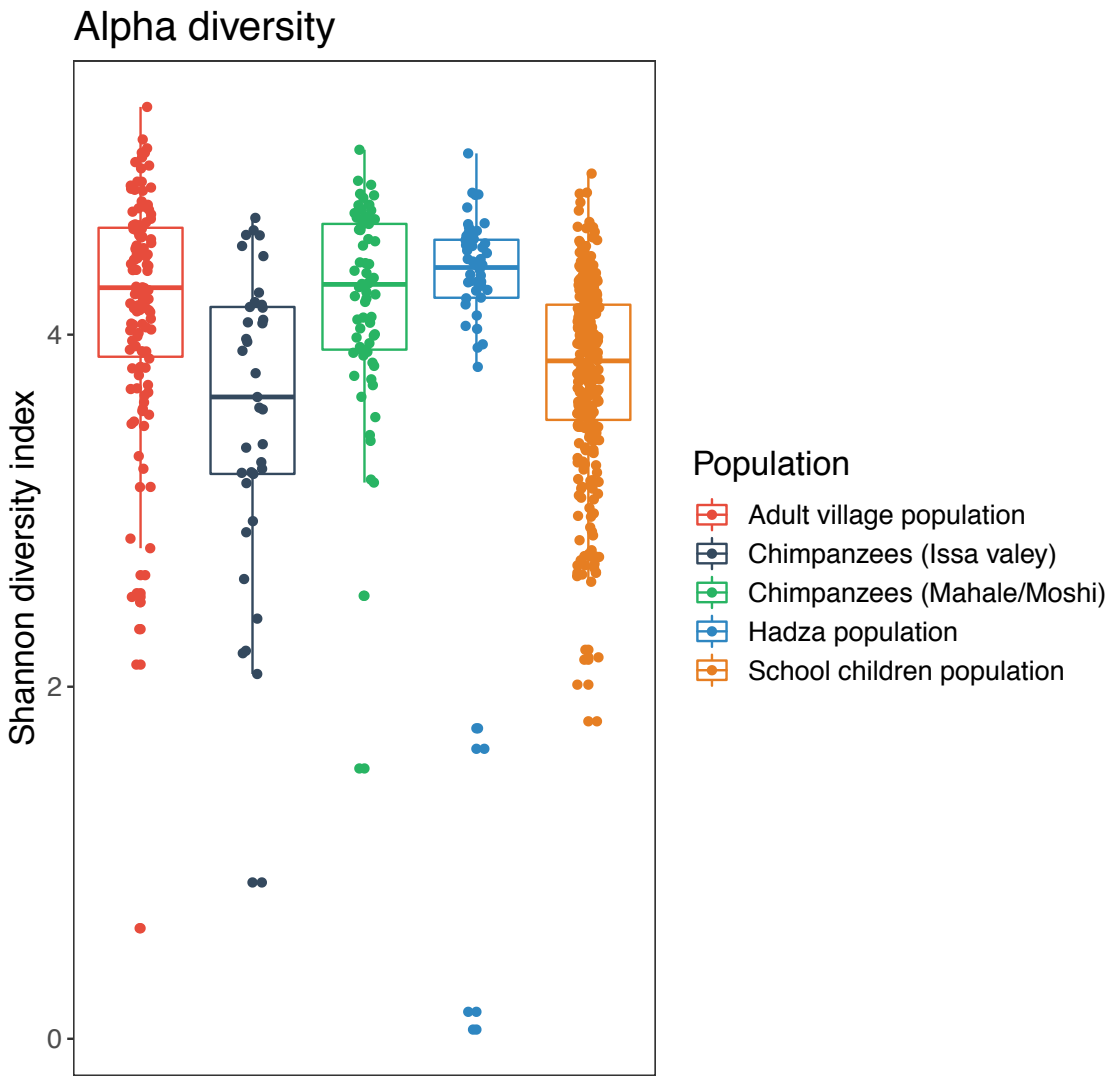
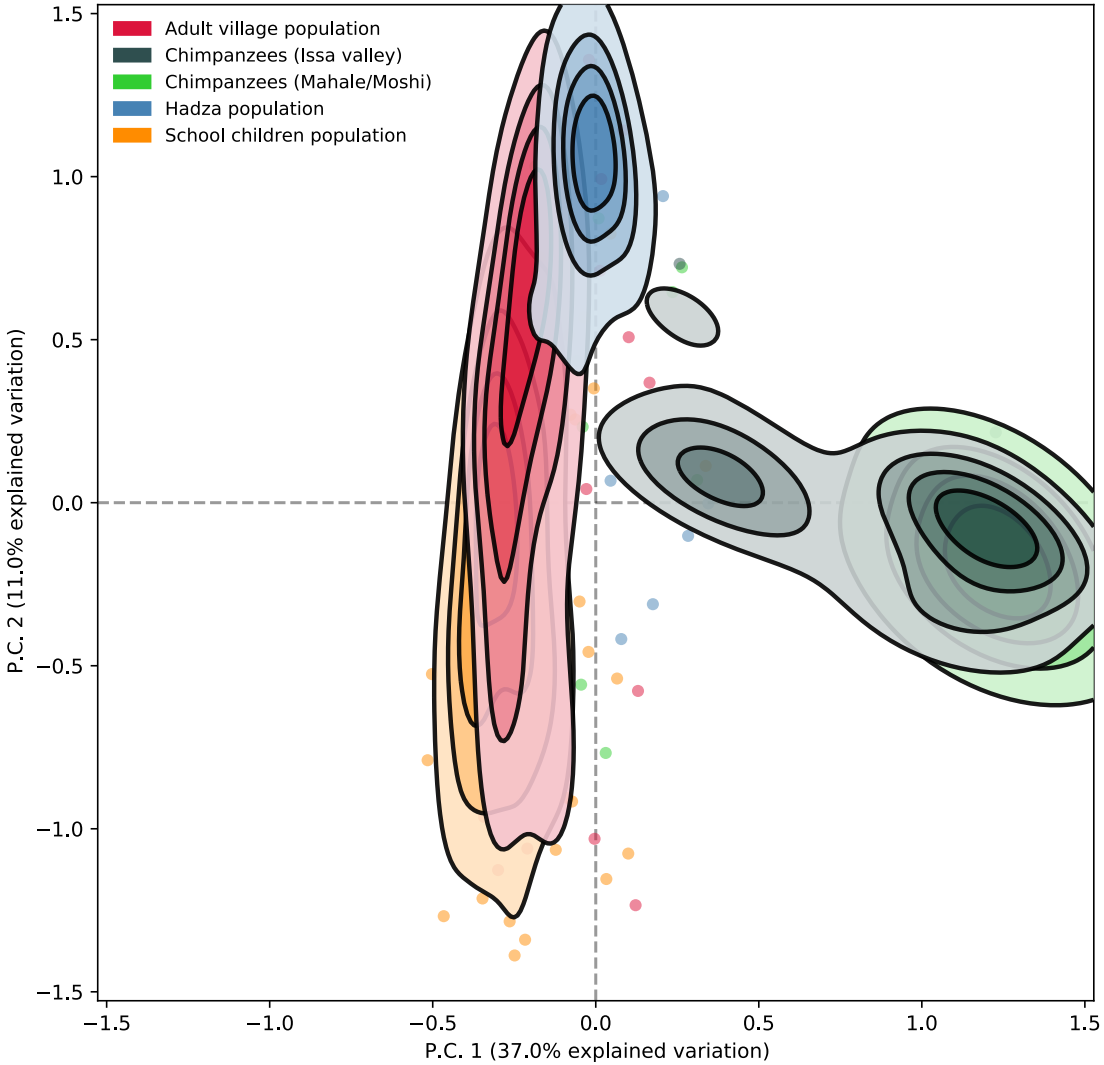

Unmapped
Unmapped fraction
75
50
25
Population
Adult village population
Chimpanzees (Issa valey)
Chimpanzees (Mahale/Moshi)
Hadza population
School children population

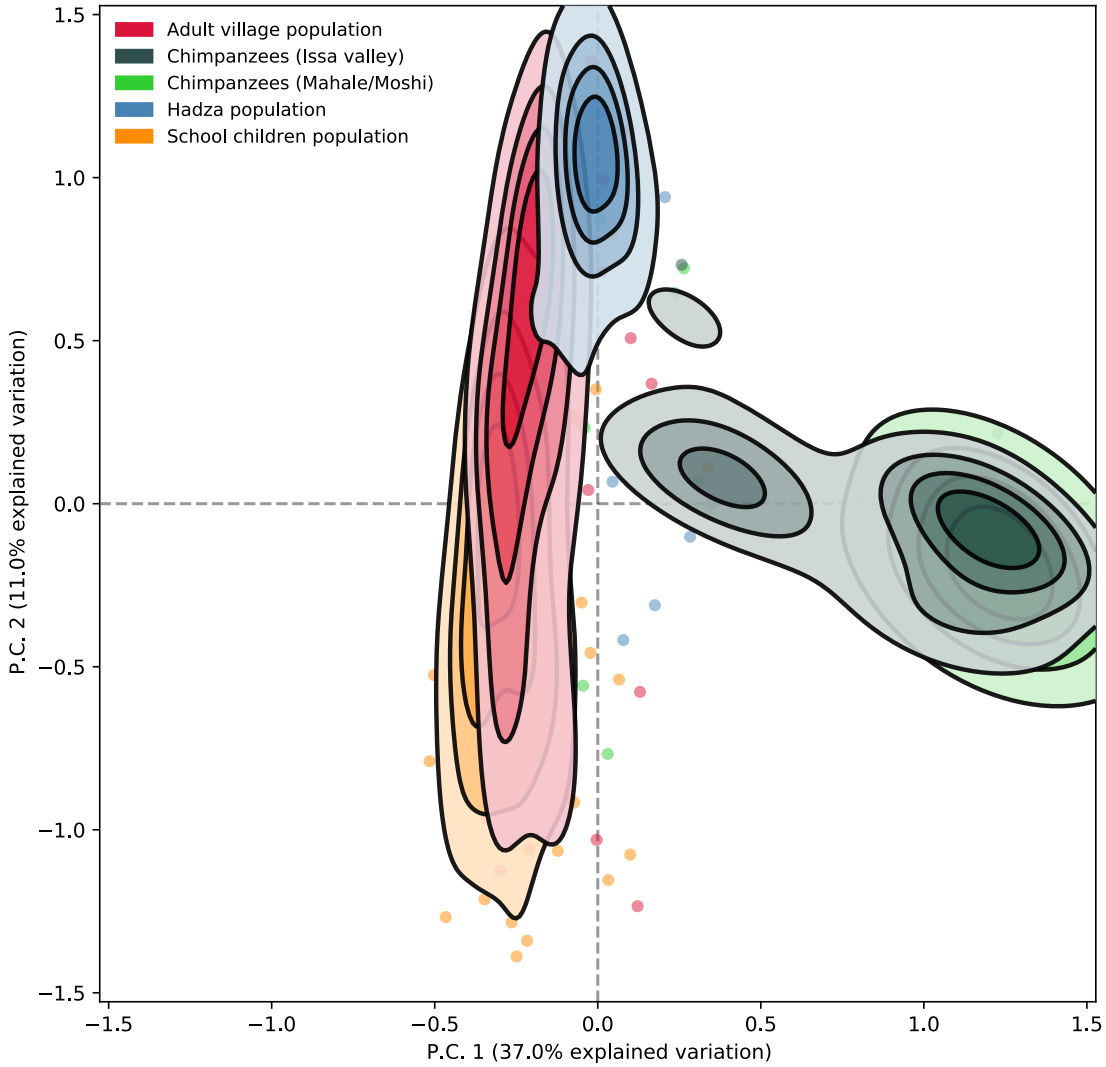
Alpha diversity



PCA - species


Adult village population
Chimpanzees (Issa valley)
Chimpanzees (Mahale/Moshi)
Hadza population
School children population
P.C. 2 (11.0% explained variation)
P.C. 1 (37.0% explained variation)
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5

PCA - species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Hadza population
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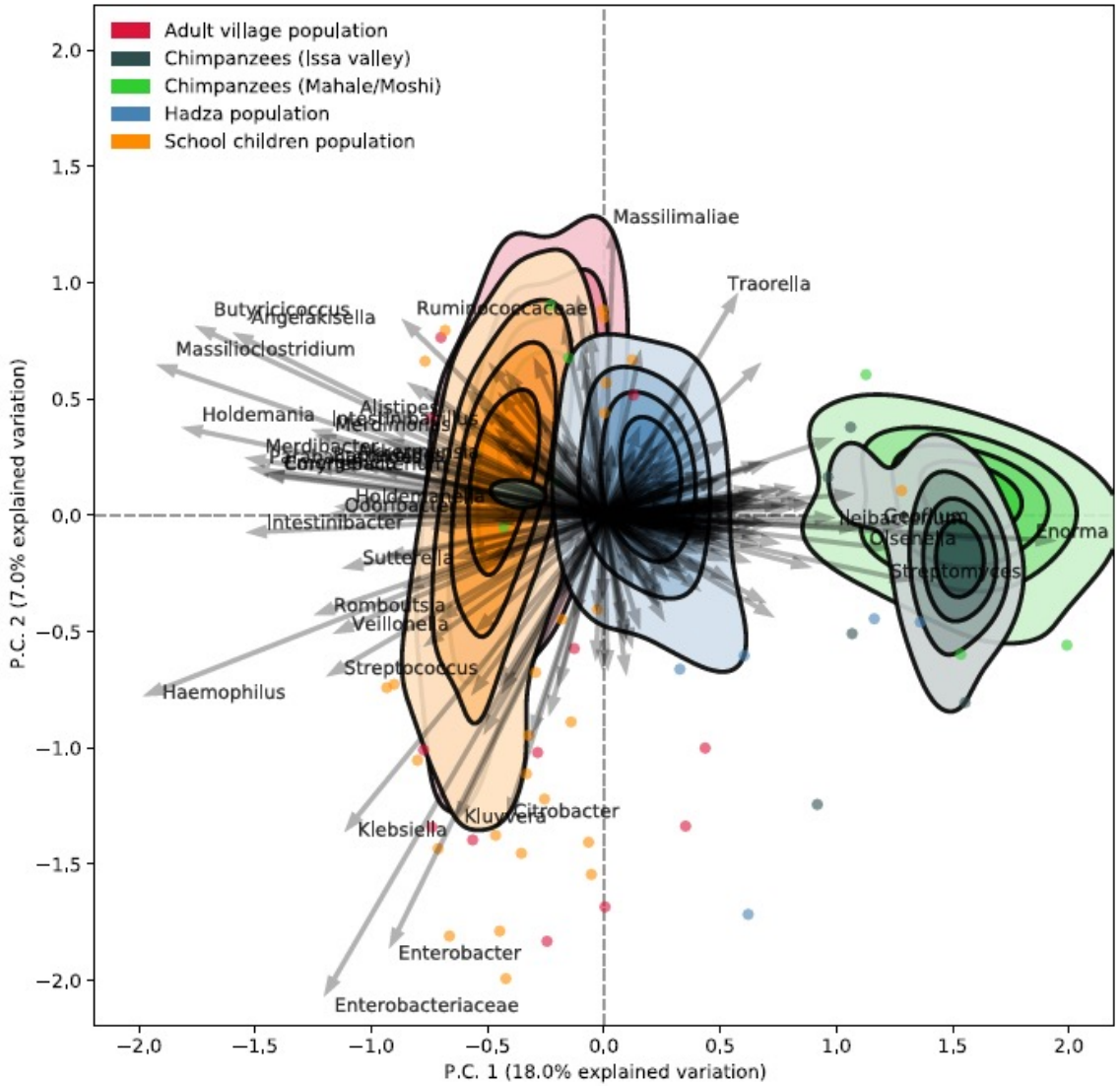
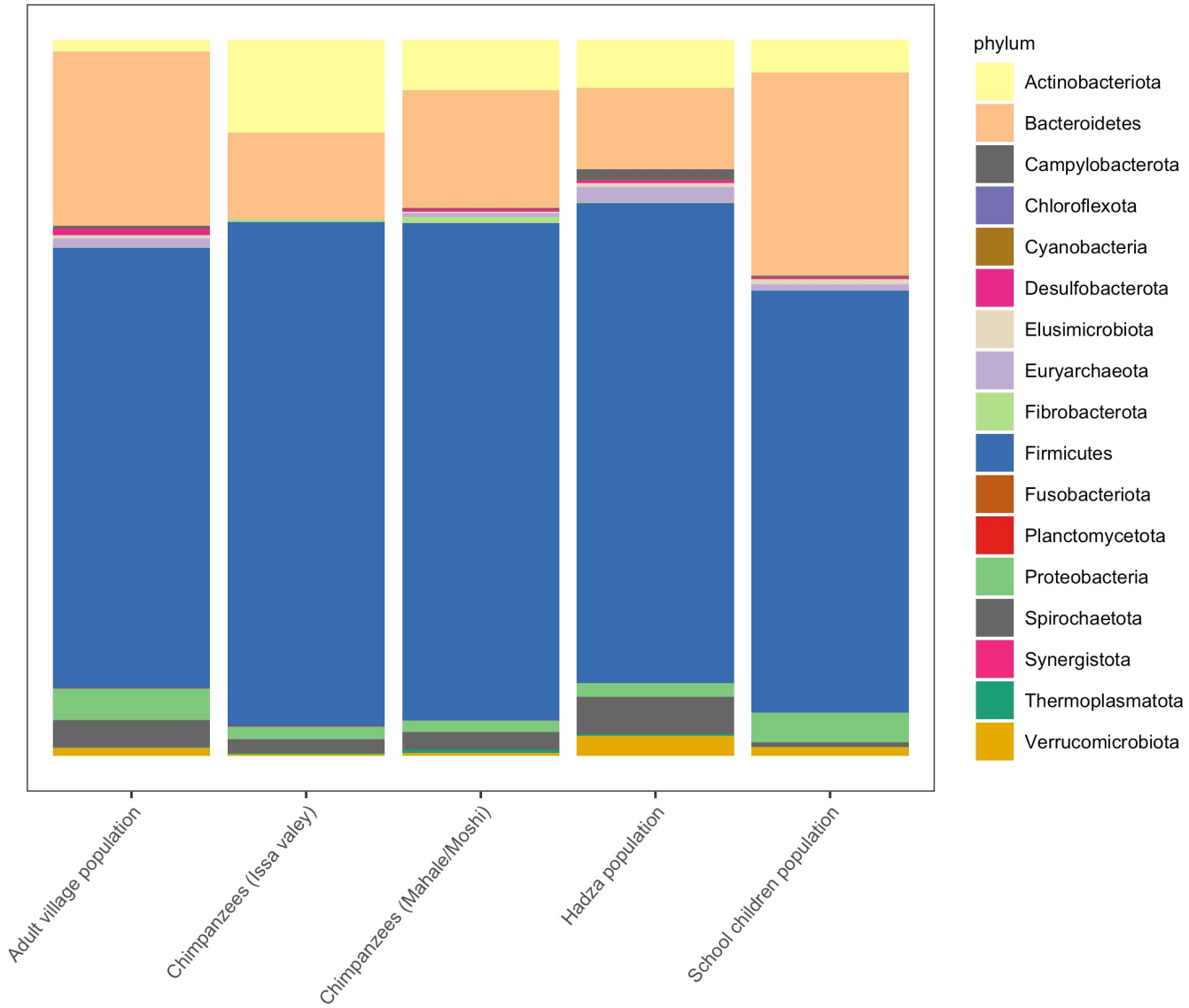
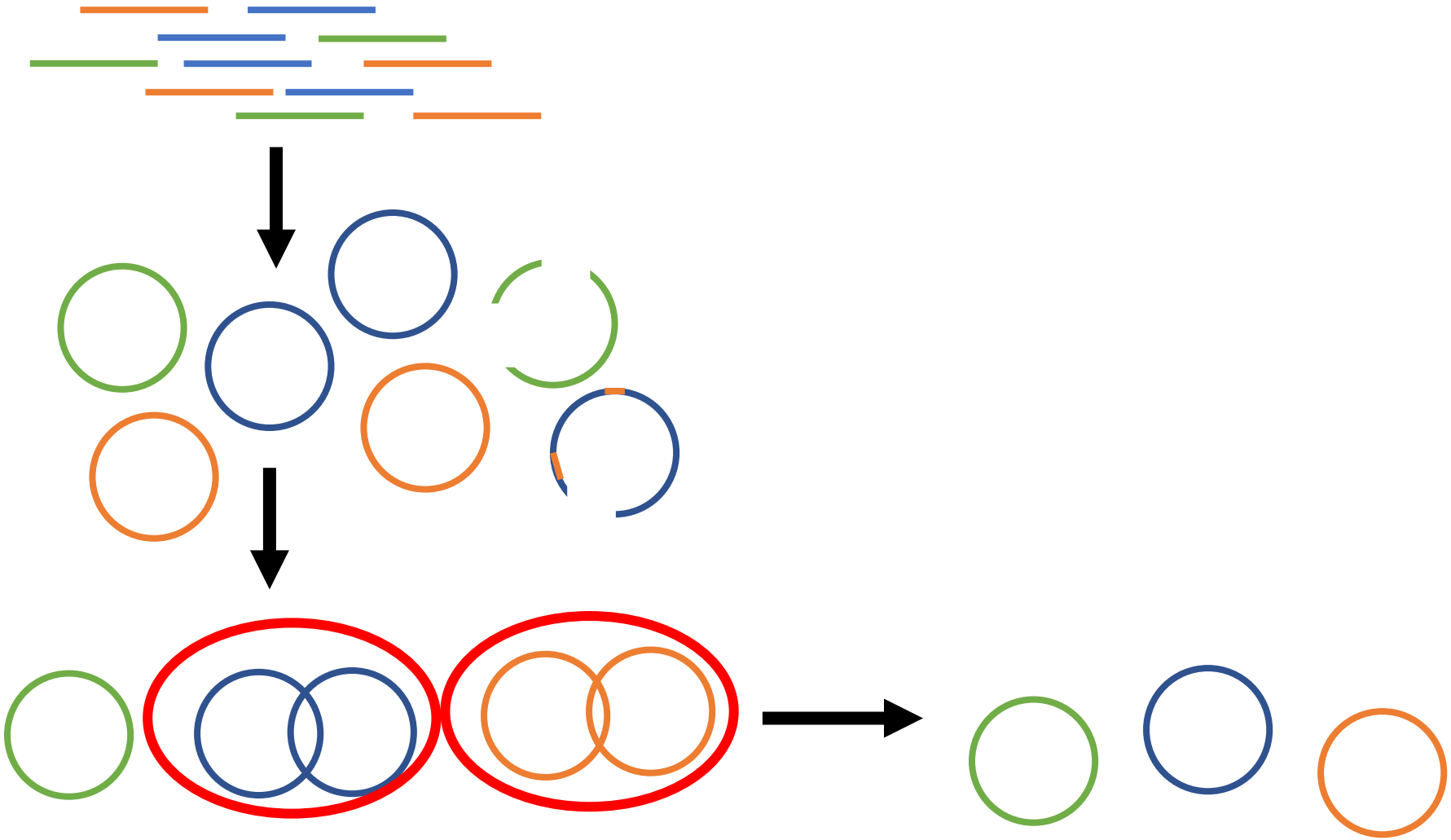
P.C. 1 (37.0% explained variation)


Adult village population
Chimpanzees (Issa valley)
Chimpanzees (Mahale/Moshi)
Hadza population
School children population
Massilimaliae
Traorella
Butyricicoccus
Angelakisella
Massilioclostridium
Holdemania
Intestinibacter
Sutterella
Romboutsia
Veillonella
Streptococcus
Haemophilus
Klebsiella
Kluyvera
Citrobacter
Enterobacter
Enterobacteriaceae
Olsenella
Enorma
Streptomyces
P.C. 2 (7.0% explained variation)
P.C. 1 (18.0% explained variation)

Phylum difference



Strain differences within MAG species



Host diversity in MAGs

Cluster	Adult	Children	Chimps (Mahale)	Hadza
C1	46	127	3	12
C2	47	107	14	8
C3	29	139	5	1
C4	25	89	2	20
C5	30	101	4	0
C6	45	77	4	6
C7	44	64	4	20
C8	8	104	2	1
C9	41	67	5	1
C10	20	88	1	4
C11	21	89	1	0
C12	28	75	3	1
C13	16	86	2	0
C14	43	47	4	8

Cluster (dRep)	Adult	Chimps (Issa)	Children	Chimps (Mahale)	Hadza
1176_1	2	4	0	47	0
1322_1	47	1	107	14	8
144_1	4	4	0	43	0
45_1	4	4	0	40	0
557_1	4	3	0	43	0
58_1	2	5	0	48	0
590_1	5	4	0	56	0
621_1	6	2	0	41	0
86_1	4	1	0	48	0

MAG taxonomy and R^2

Cluster	superkingdom	phylum	class	order	family	genus	species	R2
C1	Bacteria	Firmicutes	Clostridia	Oscillospirales	Acutalibacteraceae	Ruminococcus	Ruminococcus	0.041
C2	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Enterobacteriaceae	Escherichia	Escherichia flexneri	0.127
C3	Bacteria	Firmicutes	Clostridia	Lachnospirales	Lachnospiraceae	Agathobacter	Agathobacter faecis	0.05
C4	Bacteria	Firmicutes	Clostridia	Christensenellales	CAG-74	UBA11524	UBA11524 sp000437595	0.107
C5	Bacteria	Bacteroidetes	Bacteroidia	Bacteroidales	Muribaculaceae	CAG-279	CAG-279 sp000437795	0.068
C6	Bacteria	Proteobacteria	Gammaproteobacteria	Enterobacterales	Succinivibrionaceae	Succinivibrio	Succinivibrio sp000431835	0.058
C7	Archaea	Euryarchaeota	Methanobacteria	Methanobacteriales	Methanobacteriaceae	Methanobrevibacter	Methanobrevibacter	0.103
C8	Bacteria	Actinobacteriota	Actinobacteria	Actinomycetales	Bifidobacteriaceae	Bifidobacterium	Bifidobacterium adolescentis	0.064
C9	Bacteria	Bacteroidetes	Bacteroidia	Bacteroidales	Bacteroidaceae	Prevotella	Prevotella sp003447235	0.073
C10	Bacteria	Bacteroidetes	Bacteroidia	Bacteroidales	Bacteroidaceae	Prevotella	Prevotella sp900313215	0.076
C11	Bacteria	Bacteroidetes	Bacteroidia	Bacteroidales	Bacteroidaceae	Bacteroides	Bacteroides	0.003
C12	Bacteria	Firmicutes	Negativicutes	Veillonellales	Dialisteraceae	Dialister	Dialister sp000434475	0.061
C13	Bacteria	Bacteroidetes	Bacteroidia	Bacteroidales	Bacteroidaceae	Bacteroides	Bacteroides uniformis	0.06
C14	Bacteria	Bacteroidetes	Bacteroidia	Bacteroidales	Muribaculaceae	C941	NA	0.105

MAG taxonomy and R^2

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C13	Bacteria	Bacteroidetes	Bacteroidia	Bacteroidales	Bacteroidaceae	Bacteroides	Bacteroides uniformis	0.06
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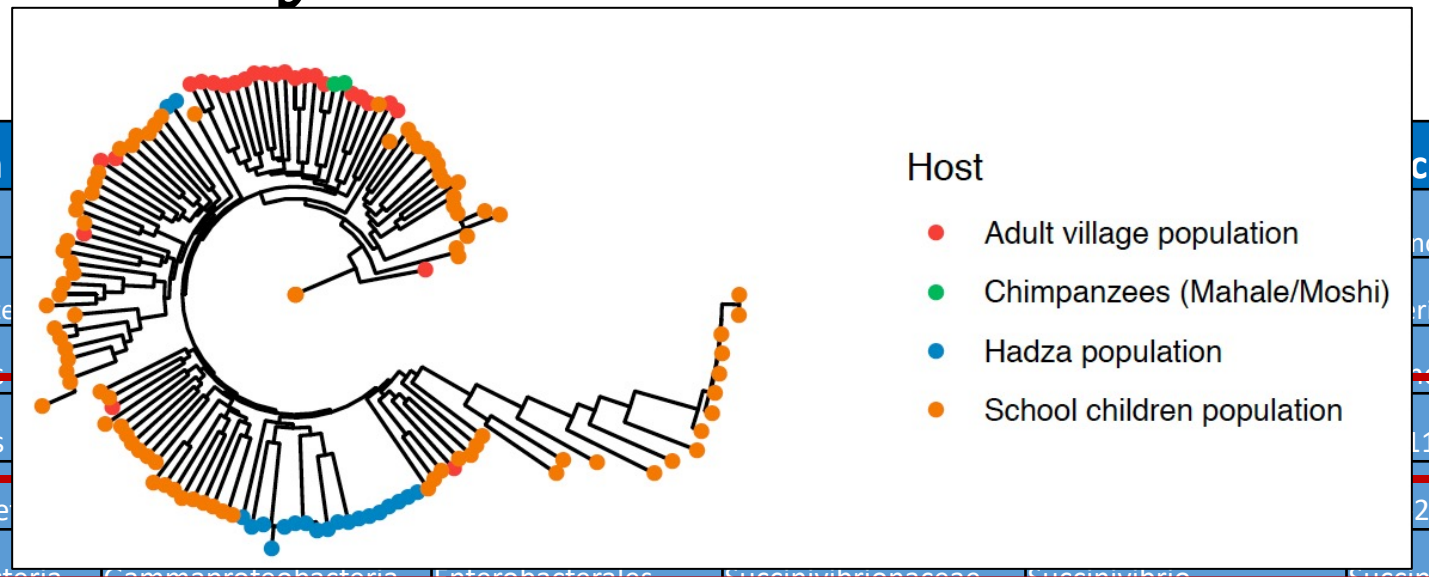
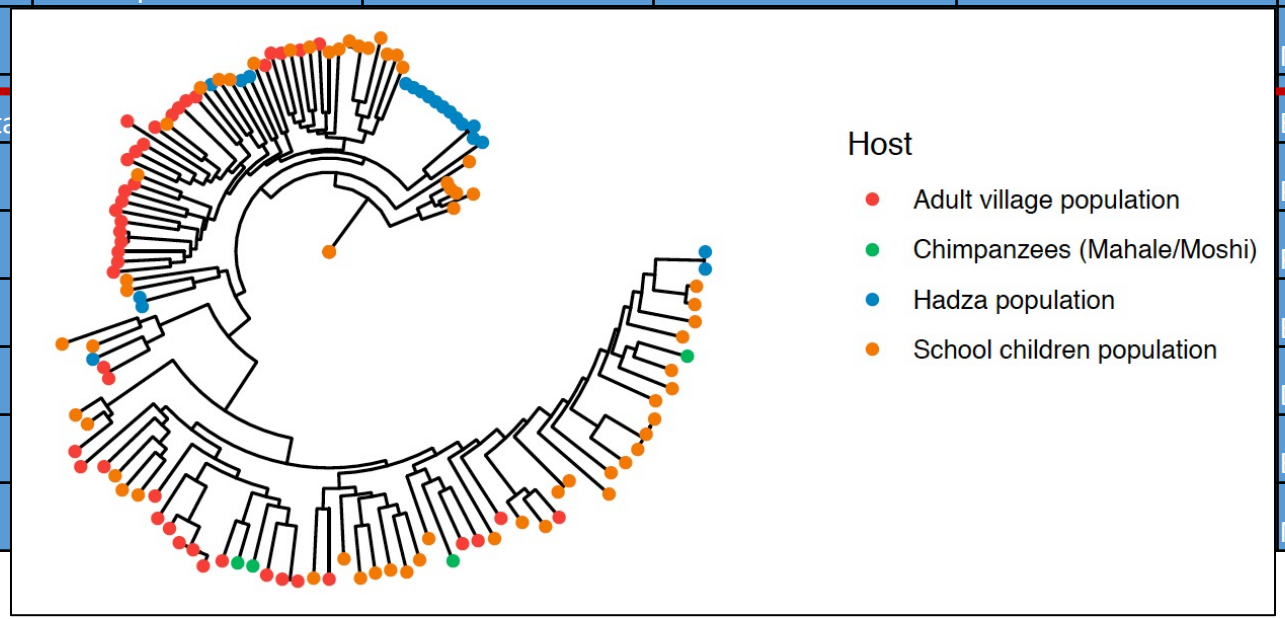
MAG taxonomy and R^2





Cluster	superkingdom	phylum	cies	R2
C1	Bacteria	Firmicutes	nococcus	0.041
C2	Bacteria	Proteobacte	richia flexneri	0.127
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C5	Bacteria	Bacteroide	279 sp000437795	0.068
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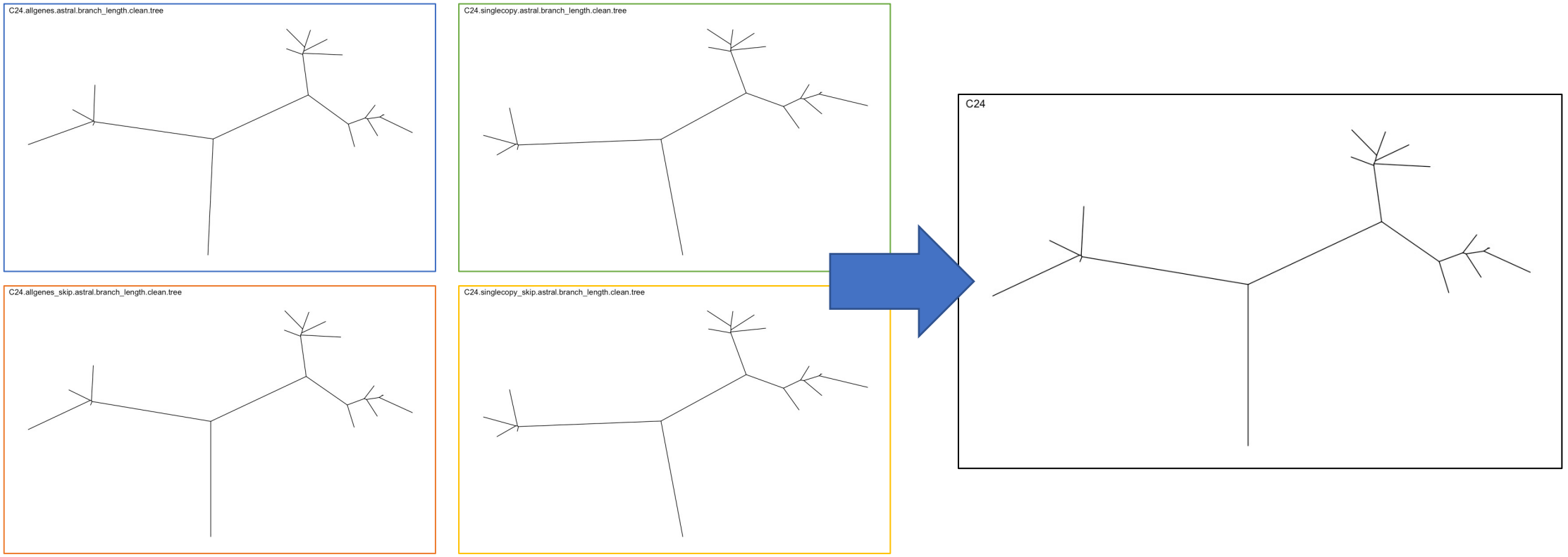
Gene trees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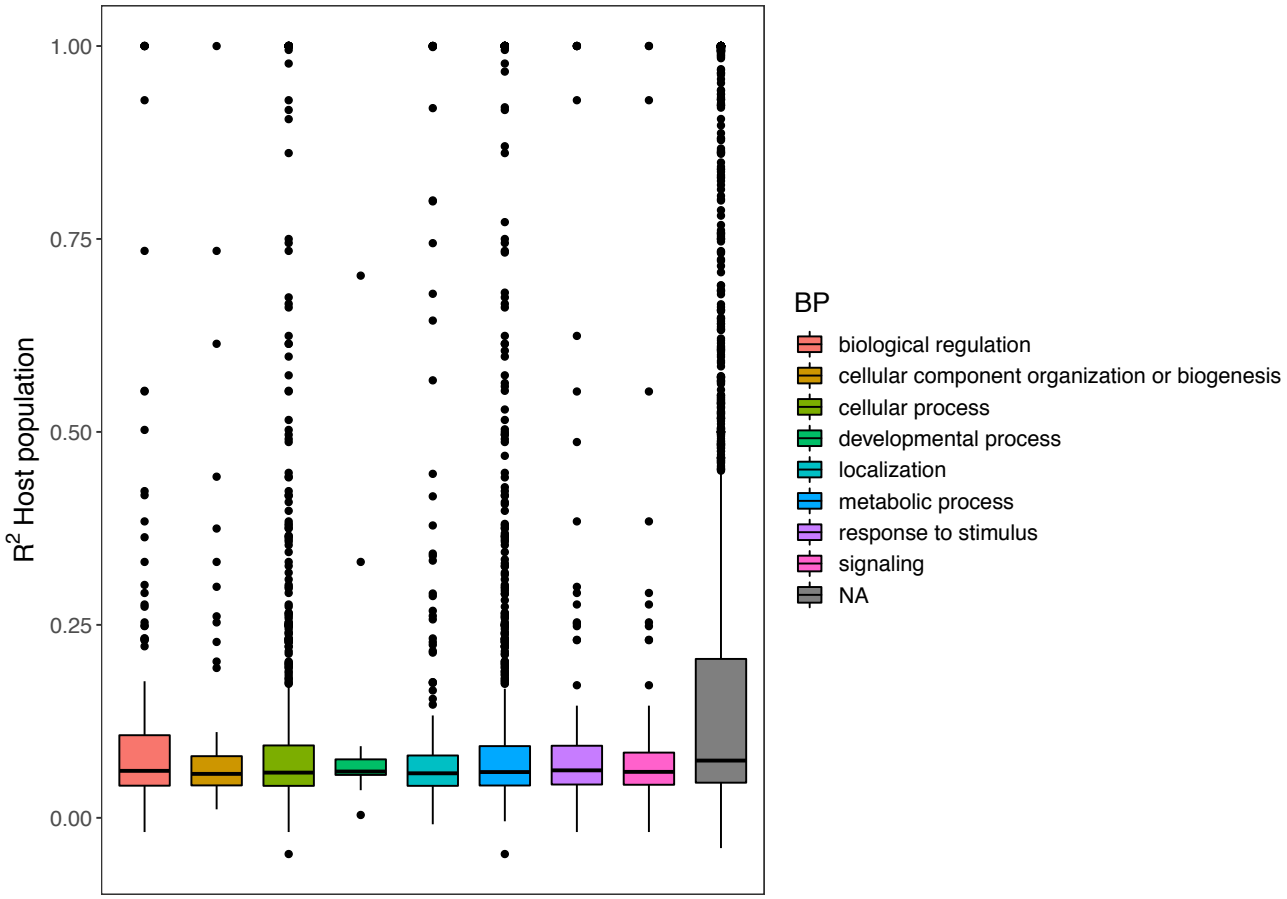
C24.singlecopy.astral.branch_length.clean.tree
C24.allgenes_skip.astral.branch_length.clean.tree
C24.singlecopy_skip.astral.branch_length.clean.tree
C24

Strain differences by biological process



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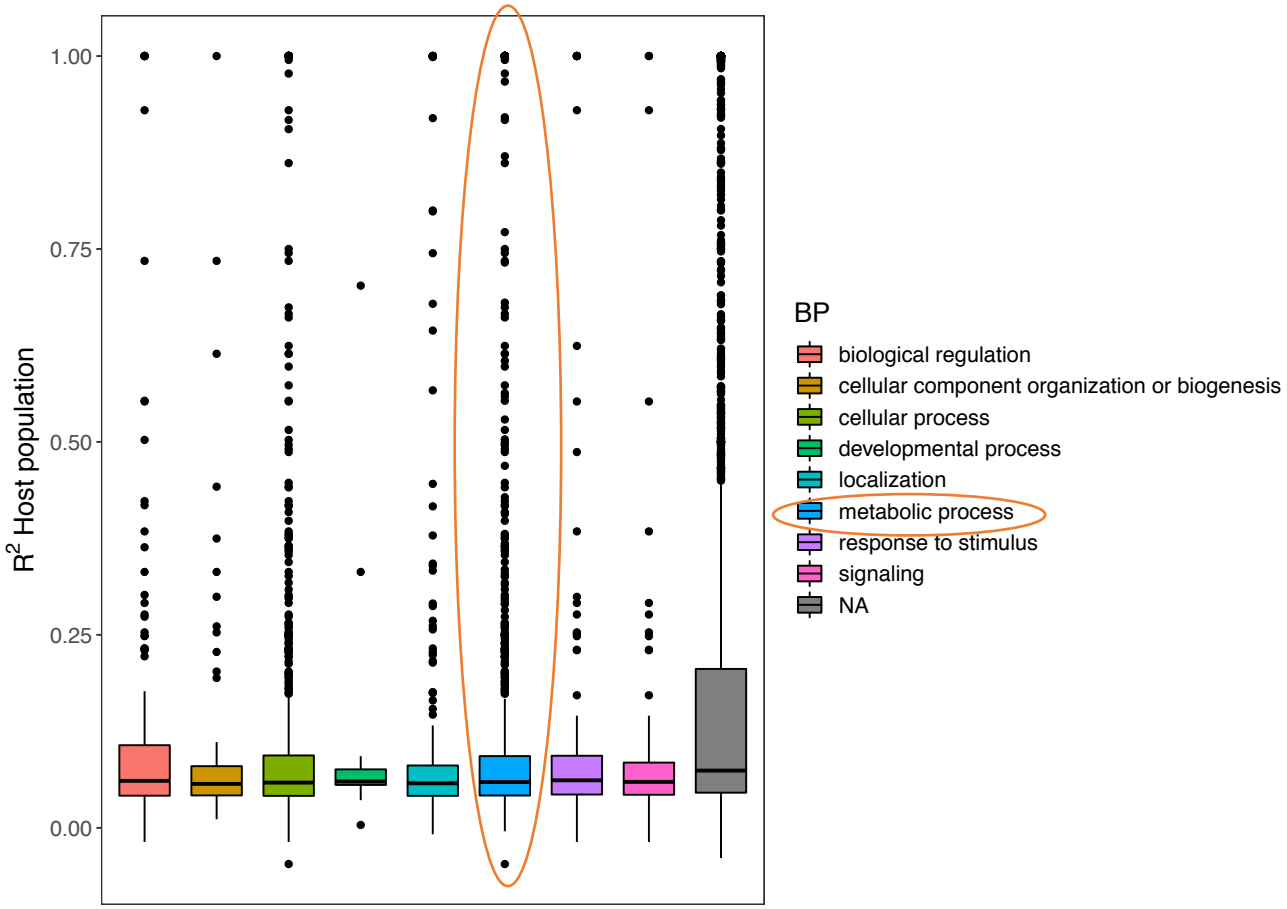

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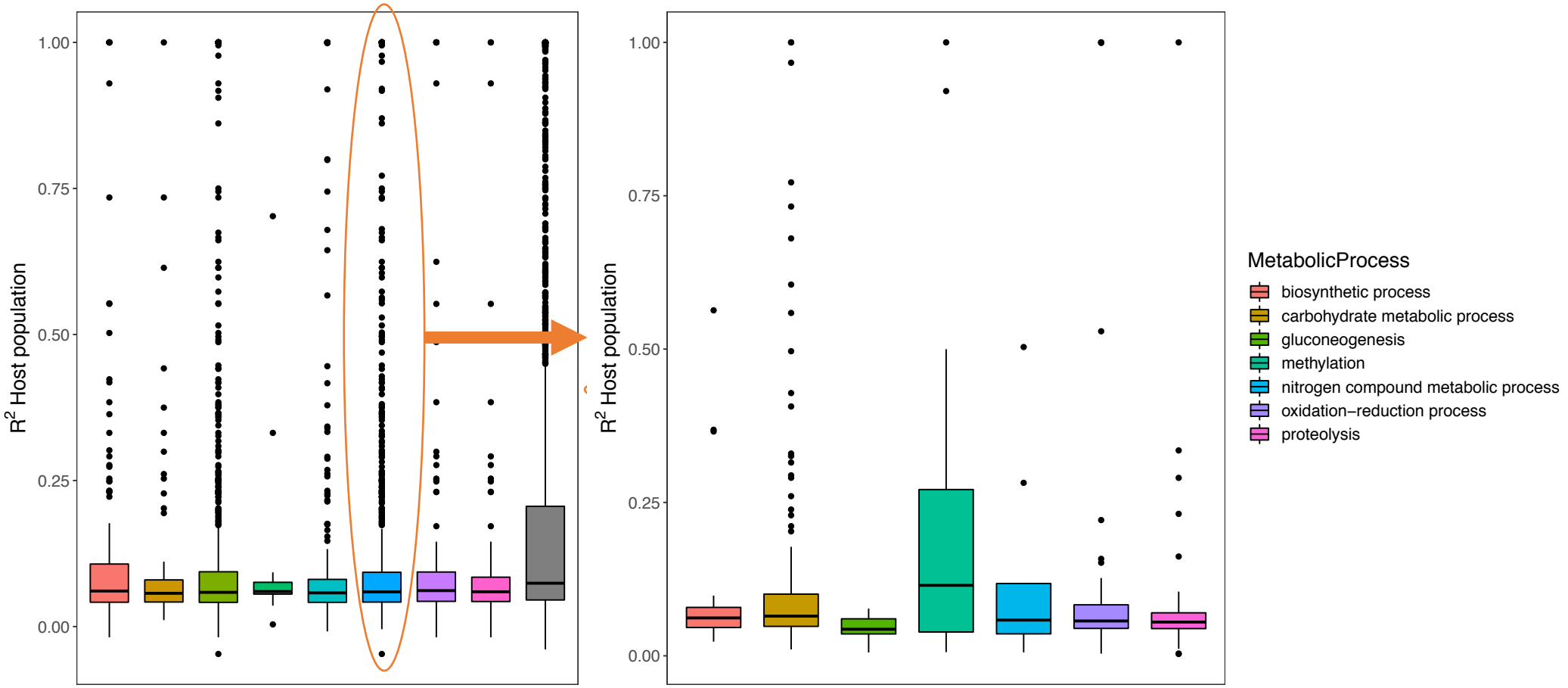
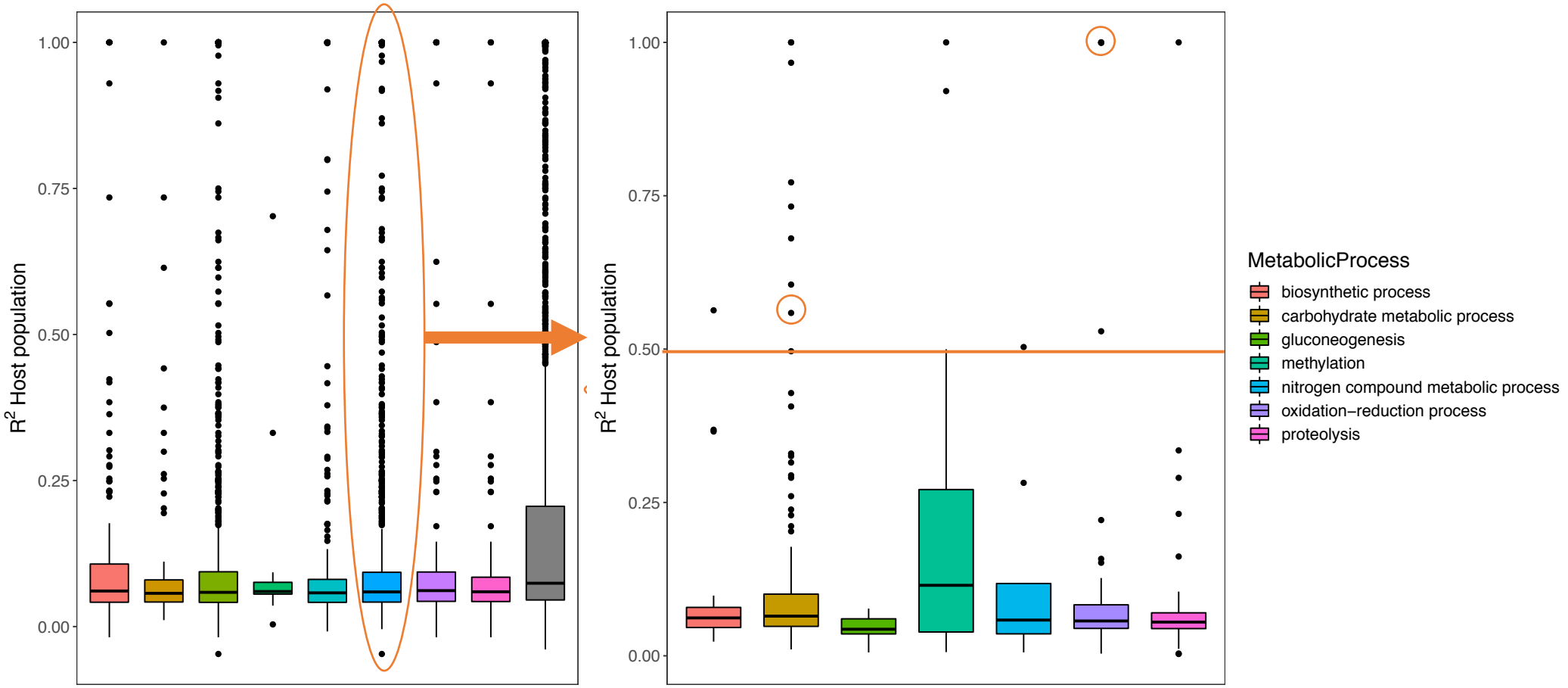
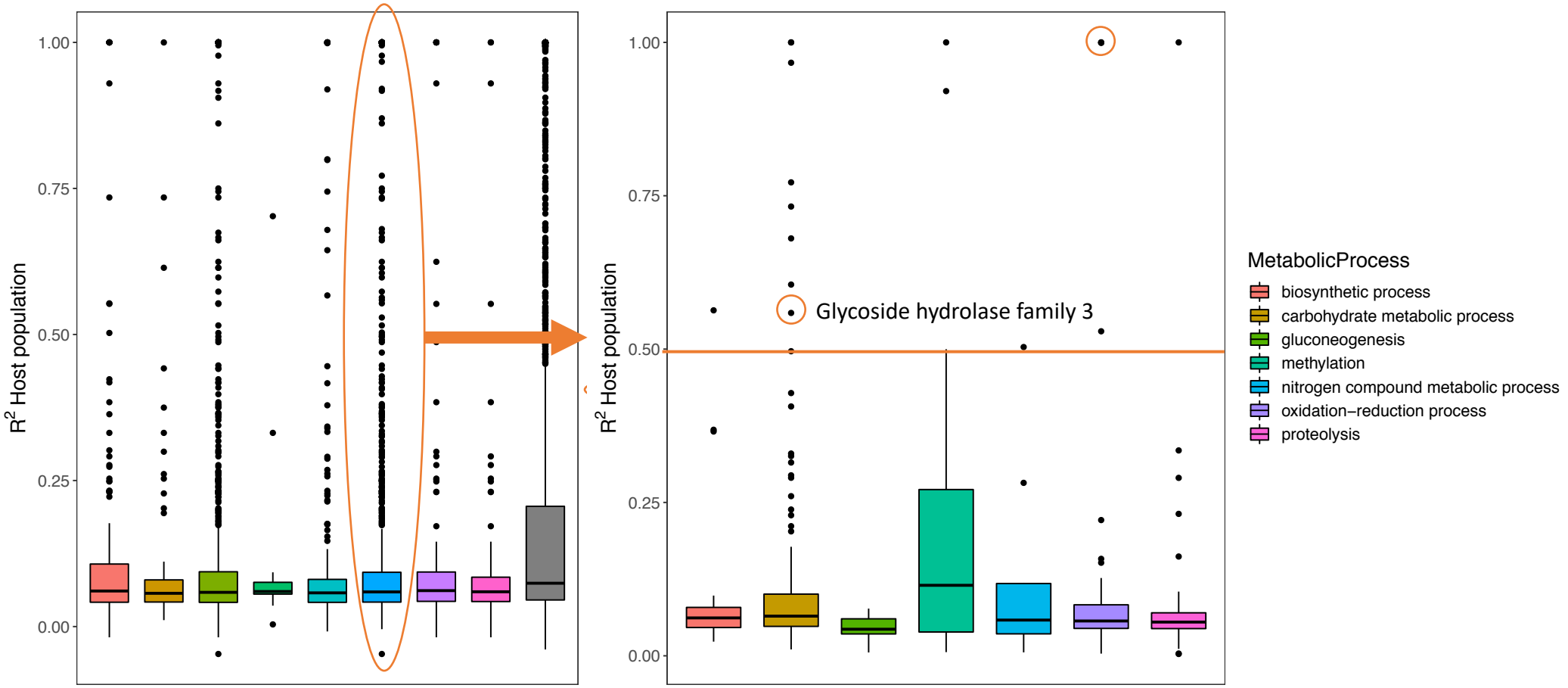


Strain differences by biological process



Strain differences by biological process



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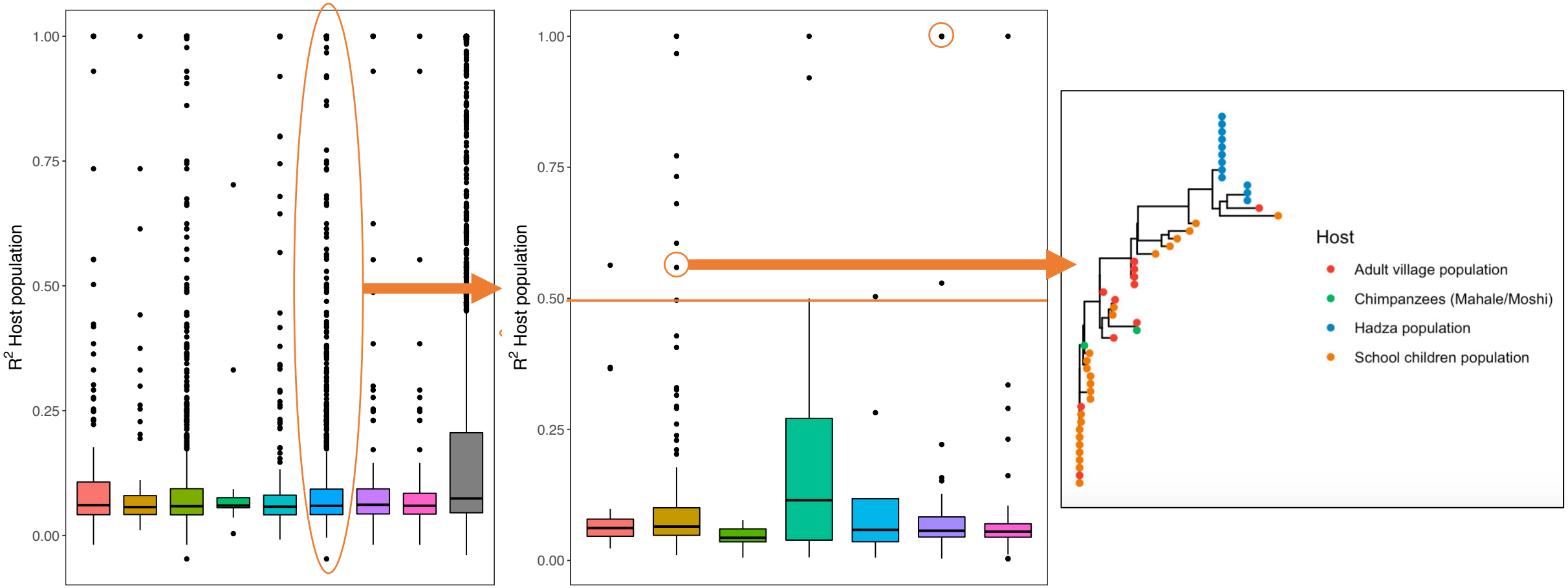

Thank you for your attention