

# The impact of an effective microorganisms (EMs) commercial probiotic products in common carp aquaculture

a bioinformatic modelling

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4. Thank you!

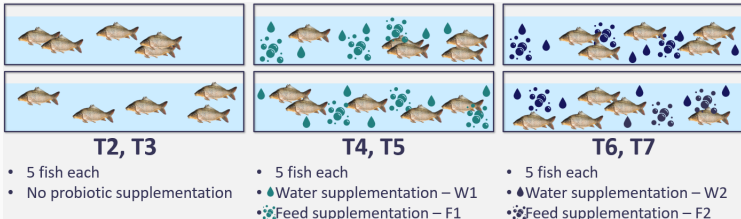
# Intro

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The main aim was to study the effect of different commercially available EM supplements on the microbial communities of common carp (*Cyprinus carpio*) and water, as well as on fish growth by conducting the 94-day experiment.

**Data:** sequences of two hypervariable regions (V3 and V4) of 16S rRNA gene from intestine and water.

**Experimental design:**



# Methods

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# Bioinformatic pipeline

1. Quality → FastQC
2. Trimming & adapters removing → Trimmomatic
3. Taxonomic classification → Kraken2

- Diversity within each sample (alpha-diversity) → Shannon index
- Diversity between samples (beta-diversity) → Bray-Curtis distance
- Differential abundance analysis →  $\log_2$ FoldChange
- Supplement influence on the weight → ANOVA



# Results

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All analysis were done on genus level.

- Most abundant genera in samples from intestine: Acinetobacter, Cetobacterium, Lactobacillus, Lactobacillus
- Most abundant genera in samples from water: Candidatus Koribacter, Cetobacterium, Nocardioideae, Rhodanobacter.

# Alpha diversity

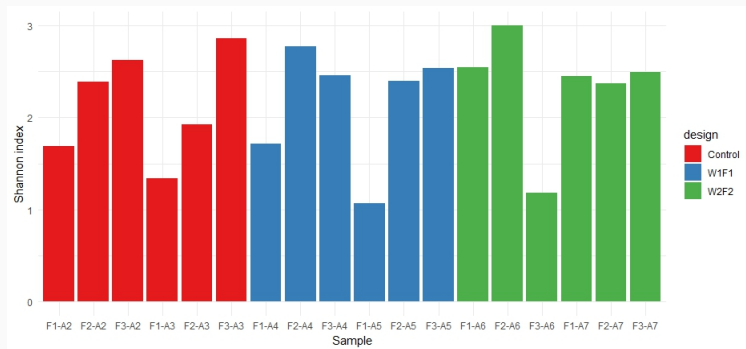


Figure 1: Alpha diversity for fish samples

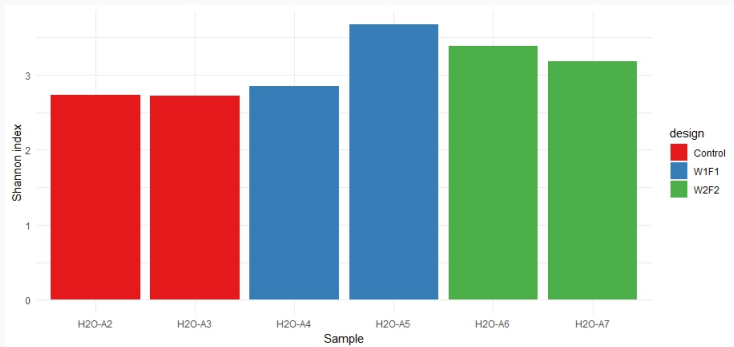


Figure 2: Alpha diversity for water samples

# Beta diversity

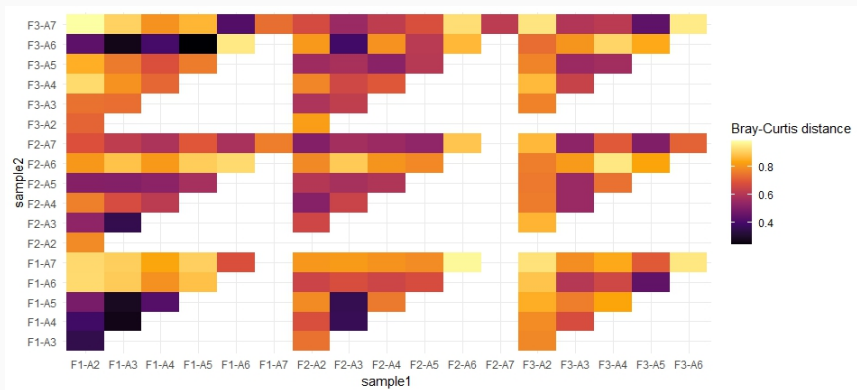


Figure 3: Beta diversity for intestine samples

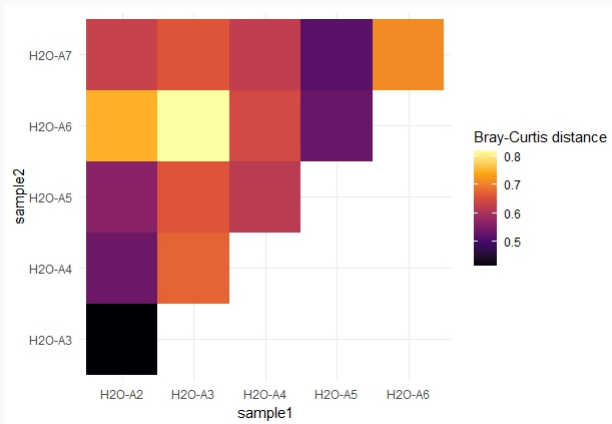


Figure 4: Beta diversity for water samples

## Differential abundance analysis

<b>genus</b>	<b>log2FoldChange</b>	<b>padj</b>
Intenstine, Control vs. design 1		
Candidatus Koribacter	-25,804	9,70E-15
Planctopirus	-23,256	4,19E-12
Iamia	-21,138	5,41E-10
Singulisphaera	-24,018	7,94E-13
Lactococcus	27,245	3,10E-16
Intenstine, Control vs. design 2		
Leptolyngbya	-23,515	1,73E-12
Aquicella	24,202	4,90E-13
Ruminococcus	-24,882	1,21E-13
Lactococcus	29,347	4,57E-21
Intestinimonas	23,881	8,64E-13
Water at the end, Control vs. design 1		
Polynucleobacter	9,563	0,049

# Influence on weight

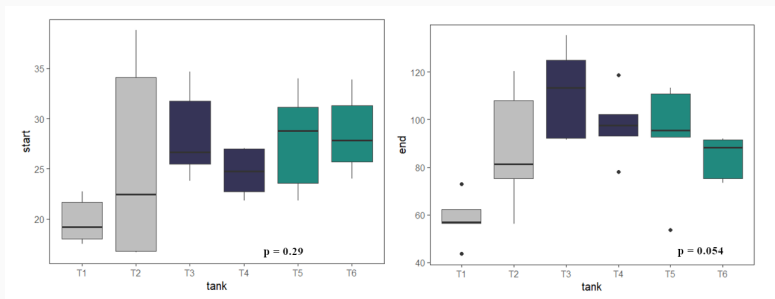


Figure 5: start - 1st day, end - 94th day



Thank you!

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