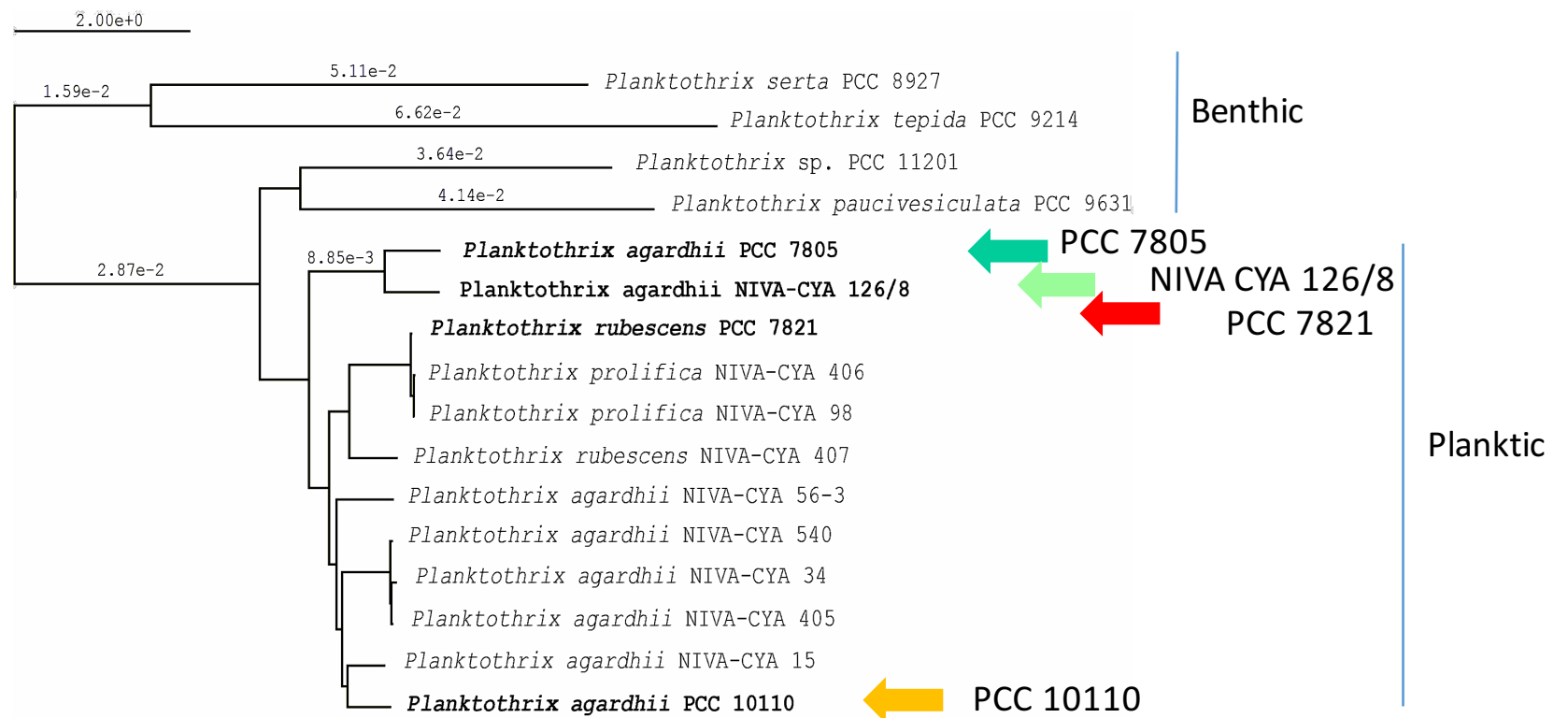


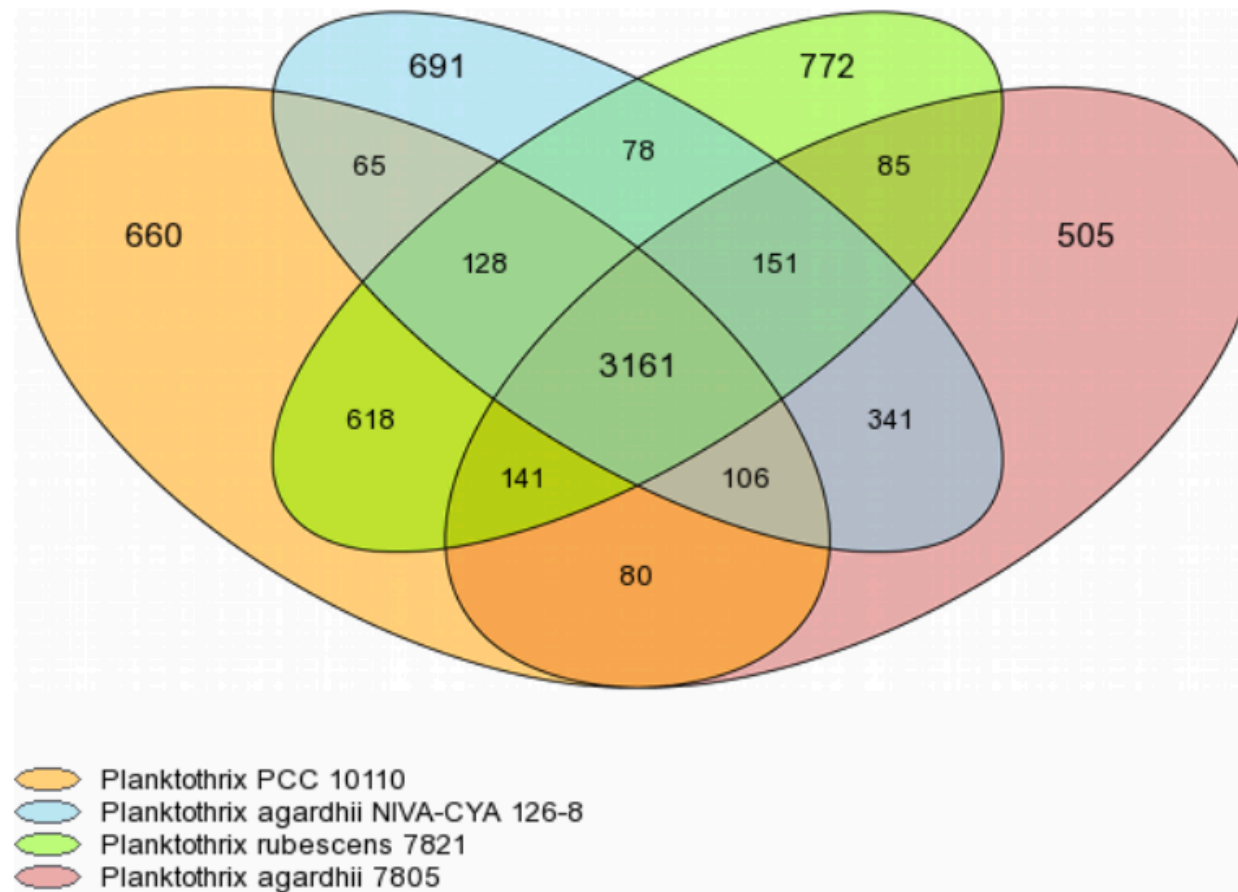
Supplementary table S1. Main characteristics of the 4 *Planktothrix* strains .

<i>Planktothrix</i> strains	PCC 7805	PCC 10110	PCC 7821	NIVA CYA 126-8
Previously named	<i>P. agardhii</i>	<i>P. agardhii</i>	<i>P. rubescens</i>	<i>P. agardhii</i>
Phenotype (color)	Green	Green	Red	Green
Major phycobiliprotein	Phycocyanin	Phycocyanin	Phycoerythrin	Phycocyanin
Microcystin synthesis	✗	✓	✓	✓
Habitat	Planktic	Planktic	Planktic	Planktic
Origin	Temperate lake, Netherlands	Temperate lake, France	Nordic lake	Nordic lake

Supplementary figure S1. Clustering of the of *Planktothrix* visualized on the MicroScope platform (<http://www.genoscope.cns.fr/agc/microscope>). The genomic similarity is estimated using Mash, a software that computes a distance between two genomes. From all the pairwise distances of the genomes set, a tree is construct dynamically using the neighbor-joining javascript package. The tree displays clustering annotations. This clustering has been computed from all-pairs distances ≤ 0.06 ($\approx 94\%$ ANI) that correspond to the ANI standard to define a species group.



Supplementary figure S2. Venn diagram of the pan-genomes (determining the common part = core-genome, or variable portion of the genome = variable-genome) of the 4 *Planktothrix* strains using the MICFAM tool computing the SiLiX software available on MicroScope platform.



Supplementary figure S3. A) Principal component analysis (PCA) of the MS/MS data set generated for each one of the four analyzed in triplicate, together with the experimental MS/MS spectra list obtained for 30 purified cyanobacterial metabolites similarly analyzed (MSMS_cyano). B) Rarefaction curve of the MS/MS cluster affection illustrates the presentativeness of the GNPS network for the global description of the 4 strains *Planktothrix* metabolomic dataset.

