

Description of Additional Supplementary Files

File name: Supplementary data S1

Description: List of *Microcystis* strains including ENA accession number of assembled genomes, genome size, completeness and contamination rates.

File name: Supplementary data S2A

Description: List of the accessory metabolites considered in the present analysis and their respective BGC with Mibig accession numbers, when available, and LC-MS2 annotation levels.

File name: Supplementary data S2B

Description: AntiSmash and LC-MSMS results for strains belonging to chemotype 1 (producing MCT > AER > CPN > MCM > MVD).

File name: Supplementary data S2C

Description: AntiSmash and LC-MSMS results for strains belonging to chemotype 2 (producing MCT > AER > MAA).

File name: Supplementary data S2D

Description: AntiSmash and LC-MSMS results for strains belonging to chemotype 3 (producing MCT > AER > CPN > MAA > MCM).

File name: Supplementary data S2E

Description: AntiSmash and LC-MSMS results for strains belonging to chemotype 4 (producing MAA > MCT > AER > CPN > ARG).

File name: Supplementary data S2F

Description: AntiSmash and LC-MSMS results for strains belonging to chemotype 5 (producing MCT > MCM > SPM > MAA).

File name: Supplementary data S2G

Description: AntiSmash and LC-MSMS results for strains belonging to chemotype 6 (producing ABL-like > MCM > MAA).

File name: Supplementary data S2H

Description: AntiSmash and LC-MSMS results for strains belonging to chemotype 7 (producing AER > MAA).

File name: Supplementary data S2I

Description: AntiSmash and LCMSMS results for strains belonging to chemotype 8 (producing ARG > MGN > ABL > MCM).

43 **File name:** Supplementary data S2J
44 **Description:** AntiSmash and LC-MSMS results for strains belonging to chemotype 9 (producing
45 MAA > CNP > MGN).
46
47 **File name:** Supplementary data S2K
48 **Description:** AntiSmash and LC-MSMS results for strains belonging to chemotype 10
49 (producing ANB > MGN > CPN > MCM > MAA > SPM).
50
51 **File name:** Supplementary data S2L
52 **Description:** AntiSmash and LC-MSMS results for strains belonging to chemotype 11
53 (producing MAA > ANB > CNP > MGN > MVD).
54
55 **File name:** Supplementary data S2M
56 **Description:** AntiSmash and LC-MSMS results for strains belonging to chemotype 12
57 (producing MCM > MCT > CNP > MGN > SPM).
58
59 **File name:** Supplementary data S2N
60 **Description:** AntiSmash and LC-MSMS results for strains belonging to chemotype 13
61 (producing ARG > MCT > MCM > CNP).
62
63 **File name:** Supplementary data S2O
64 **Description:** AntiSmash and LC-MSMS results for singleton strains.
65
66 **File name:** Supplementary data S2P
67 **Description:** Synthetic list of AntiSmash (annotation %) and LC-MSMS (in gray when detected)
68 results for all strains. *: The product of these BGC remains unknown in *Microcystis*.
69
70 **File name:** Supplementary data S3A
71 **Description:** Metabolite contents in the 65 European *Microcystis* strains based on LC-MS+
72 analysis performed in triplicats.
73
74 **File name:** Supplementary data S3B
75 **Description:** Metabolite contents in the 65 European *Microcystis* strains based on merged LC-
76 MS+ and LCMSanalysis.
77
78 **File name:** Supplementary data S3C
79 **Description:** Metabolite contents in the 58 European *Microcystis* strains from PMC based on
80 three successive cultures using LC-MS+ analysis.
81
82 **File name:** Supplementary data S4
83 **Description:** Embryo larval toxicity of 12 *Microcystis* strains belonging to 6 distinct genotypes.