S3 Table. Alignment of bases consistently variable between operons in *Scytonema hyalinum*. Color coding: yellow = consensus bases consistent with Type 2 operons; blue = consensus bases consistent with Type 1 operons; green = consensus bases unique to *Brasilonema*; gray = variable bases not consistent with any consensus base. Question marks = missing data. Helix number given in accordance to Fig. 2, with position numbers based on 1501 positions in alignment of complete 16S rRNA molecule in *Scytonema hyalinum sensu lato*. *Brasilonema* is 54% like Type 2 operons, 28% like Type 1 operons, and 19% unique to *Brasilonema* or variable (consensus with < 85% saturation).

	HHHHHHHHHHHHH HHHHH HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH HHHHHHHHHHHHHHHHHHHHHHHH
Helix	0000000000000 00000 0000111111011111011111222222222222222222222222222222222222222333333333333333344433444 444444244444444444444444
	6666666666677 88888 9999000000071112256677700011111111111122333333322220778233333333333999900042111 333333844444444444444444
	00000000000000000000000000000000000000000000000000000000000000000000000000000000000001111111111111111111111111111111111111
Nucleotide position	00000000000111111111111111111111122222333444555555555555556666666666666667778889999999999990011111112222233333333333344444444444
	67777777888122244666777788889992457839922423344444578990001133556679900155846666777779780022257034990122224788890001122334
	90123578023937918125123412452487728142919193523467938891231245891241901316342346123450451904871099129312675723490270120126 0
Scytonema hyalinum sp. 1 CMT-1BRIN-NPC30	GA--CCTCGGTGCTCTGGGGTATG--A-TAGATGTTGCGGGCCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCCTCTGGGAGGCTAGGCCAGATTTCGG-ACA?????????????????
Scytonema hyalinum sp. 1 CMT-1BRIN-NPC31	GA--CCTCGGTGCTCTGGGGTATG--A-TAGATGTTGCGGGCCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCCTCTGGGAGGCTAGGCCAGATTTCGG-ACA?????????????????
Scytonema hyalinum sp. 1 CMT-1BRIN-NPC32	GA--CCTCGGTGCTCTGGGGTATG--A-TAGATGTTGCGGGCCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCCTCTGGGAGACTAGGCCAGATTTCGG-ACACCCACCCTTTCGGGTAG
Scytonema hyalinum sp. 1 CMT-1BRIN-NPC39	GA--CCTCGGTGCTCTGGGGTATG--A-TAGATGTTGCGGGCCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCCTCTGGGAGGCTAGGCCAGATTTCGG-ACA?????????????????
Scytonema hyalinum sp. 1 CMT-1SWIN-NPC17	GA--CCTCGGTGCTCTGGGGTATG--A-TAGATGTTGCGGGCCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGYCTCTGGGAGGCTAGGCCAGATTTC????????????????????????
Scytonema hyalinum sp. 1 CNP2-Z1-C01	?????????????????????????????????????GCGGGCCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCCTCTGGGAGGCTAGGCCAGATTTCGG-ACACCCACCCTTTCGGGTAG
Scytonema hyalinum sp. 1 DV1-KK3	?A--CCTCGGTGCTCTGGGGTTGG--A-TAGATGTTGCGGGCCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCCTCTGGGAGGCTAGGCCAGATTTCGG-ACACCCACCCTTTCGGGTAG
Scytonema hyalinum sp. 1 DV1-KK4	GA--CCTCGGTGCTCTGGGGTTGG--A-TAGATGTTGCGGGCCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCCTCTGGGAGGCTAGGCCAGATTTCGG-ACACCCACCCTTTCGGGTAG
Scytonema hyalinum sp. 1 EM3-HA15	GA--CCTCGGTGCTCTGGGGTATG--A-TAGATGTTGCGGGCCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCCTCTGGGAGGCTAGGCCAGATTTCGG-ACA?????????????????
Scytonema hyalinum sp. 1 EM3-HA19	GA--CCTCGGTGCTCTGGGGTATG--A-TAGATGTTGCGGGCCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCCTCTGGGAGGCTAGGCCAGATTTCGG-ACA?????????????????
Scytonema hyalinum sp. 1 EM3-HA20	GA--CCTCGGTGCTCTGGGGTATR--A-TAGATGTTGCGGGCCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCCTCTGGGAGGCTAGGCCAGATTTCGG-ACA?????????????????
Scytonema hyalinum sp. 1 EM3-HA25	GA--CCTCGGTGCTCTGGGGTATG--A-TAGATGTTGCGGGCCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCCTCTGGGAGGCTAGGCCAGATTTCGG-ACACCCACCCTTTCGGGTAG
Scytonema hyalinum sp. 1 EM3-Z1_c02	GA--CCTCGGTGCTCTGGGGTATG--A-TAGATGTTGCGGGCCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCCTCTGGGAGGCTAGGCCAGATTTCGG-ACACCCACCCTTTCGGGTAG
Scytonema hyalinum sp. 1 FI5-JRJ03_	GA--CCTCGGTGCTCTGGGGTATG--A-TAGATGTTGCGGGCCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCCTCTGGGAGGCTAGGCCAGATTTCGG-ACACCCACCCTTTCGGGTAG
Scytonema_hyalinum sp. 1 FI8A-2-AF334699	?????????????????????????????????????GCGGGCCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCCTCTGGGAGGCTAGGCCAGATTTCGG-ACACCCACCCTTTCGGGTAG
Scytonema hyalinum sp. 1 WJT4-NPBG1	?????CTCGGTGCTCTGGGGTATG--A-TAGATGTTGCGGGCCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCCTCTGGGAGGCTAGGCCAGATTTCGG-ACA?????????????????
Scytonema hyalinum sp. 1 WJT9-NPBG6A	???????????GCTCTGGGGTTGG--A-TAGATGTTGCGGGCCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCCTCTGGGAGGCTAGGCCAGATTTCGG-ACACCCACCCTTTCGGGTAG
Scytonema hyalinum sp. 1 WJT9-NPBG6B	???????????GCTCTGGGGTTGG--A-TAGATGTTGCGGGCCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCCTCTGGGAGGCTAGGCCAGATTTCGG-ACACCCACCCTTTCGGGTAG
Scytonema hyalinum sp. 1 PT10-MK84	?G--CCTCGGTGCTCTGGGGTTGG--A-TAGATGTTGCGGGCCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCCTCTGGGAGGCTAGGCCAGATTTCGG-ACACCCACCCTTTCGGGTAG
Scytonema hyalinum sp. 1 ACOI2287	GG--CCTCGGTGCTCTGGGGTATG--A-TAGATGTTGCGGGCCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCCTCTGGGAGGCTAGGCCAGATTTCGG-ACACCCACCCTTTCGGGTAG
Scytonema hyalinum sp. 2 JOH18	GG--CCTAGGCGCTCTGGGGGTGG--A-TAGATGTCGCGGTCCCCCAAGACCAACTAGAATGGACAGGTTAGGCGCCTCTGGGGGGCTAGGCCAGATTGTGG-ACACCCACCCTTTCGGGTAG
Scytonema hyalinum sp. 2 F10-MK28	GA--CCTCGGTGCTCTGGGGGTGG--A-TAGATGTTGCGGACCCCCAAGACCAACTAGAATGGACAGGTTAGGCGCCTCTGGGAGGCTAGGCCAGATTGTGG-ACACCCACCCTCTCGGGTAG
Scytonema hyalinum sp. 2 ETH2.2.M10	GG--CCTCGGCGCTCTGGGGAAGG--A-TAGATGTTGCGGTCCCCCAAGTCCAACTAGAATGGACAGGTAAGGCGCTTCTGGGAGGCTAGGCCAGATTGTGG-ACACCCACCCTTTCGGGTAG
Scytonema_hyalinum sp. 2 HK-05	GG--CCTCGGCGCTCTGGGGTTTG--A-TAGATGTTGCGGGCCCCCAAGTCCAACTAGAATGGACAGGTAAGGCGCCTCTGAGAGGCGCGGCCAGATTGTGG-ACACCCACCCTCTCGGGTAG
Scytonema hyalinum sp. 3 HAF2-B2-C1	?G--CCTCGGCGCTCTGGGGTTGG--A-TAGATGTTGCGGACCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCCTGCGTTAGGCTAGGCCAGATTGTGG-ACACCCACCCTTTCGGGTAG
Scytonema hyalinum sp. 4 HTT-U-KK4	GG--CCTCGGCGCTCTGGGGAAGG--A-TAGATGTTGCGGGCCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCCTGCGTTAGGCTAGGCCAGATTGTGG-ACACCCACCCTTTCGGGTAG
Scytonema hyalinum sp. 5 HA4185-MV1	GG--CCTCGGCGCTCTGGGGAAGG--A-TAGATGTTGCGGGCCCCCAAGTCCAACTAGAATGGACAGGTAAGGCGCCTGCGTTAGGCTAGGCCAGATTGTGG-ACACCCACCCTTTCGGGTAG
Scytonema hyalinum sp. 5 ATA-SAL-RM1	???????CGGCGCTCTGGGGAAGA--A-TAGATGTTGCGGGCCCCCAAGTCCAACTAGAATGGACAGGTAAGGCGCCTGCGTTAGGCTAGGCCAGATTGTGG-ACA?????????????????
Scytonema_arcangeli CCIBt3134	?????????????????????????????????????GCGGACCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCCTGCGTTAGGCTAGGCCAGATTGTGG-ACACCCACCCTTTCGGGTAG
Scytonema_arcangeli JOH12	GG--CCTCGGCGCTCTGGGGTTGG--A-TAGATGTTGCGGACCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCCTGCGTTAGGCTAGGCCAGATTGTGG-ACACCCACCCTTTCGGGTAG
Scytonema_arcangeli Valle de Zapoltlan	GG--CCTCGGCGCTCTGGGGTATG--A-TAGATGTTGCGGACCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCCTGCGTTAGGCTAGGCCAGATTGTGG-ACACCCACCCTCTCGGGTAG
Scytonema arcangeli FL17-MK96	GG--CCTCGGCGCTCTGGGGTATG--A-TAGATGTTGCGGACCCCCAATTCCAACTAGAATGGACAGGTTAGGCGCCTGCGTTAGGCTAGGCCAGATTGTGG-ACA?????????????????
Scytonema arcangeli TH02-NP	GG--CCTCGGCGCTCTGGGGTATG--A-TAGATGTTGCGGGCCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCATGCGTTATGCTAGGCCAGATTGTGG-ACACCCACCCTTTCGGGTAG
Scytonema arcangeli M09	GG--CCTCGGCGCTCTGGGGTATR--A-TAGATGTTGCGGGCCCCCAAGTCCAACTAGAATGGACAGGTTAGGCGCATGCGTTATGCTAGGCCAGATTGTGG-ACACCCACCCTTTCGGGTAG
Scytonema hyalinum sp. 1 CMT-1BRIN-NPC30	?????????CTCAATGCAAATTTACGGTCGTTAACCATAAATGTTTTGTCTTGGACGAGCCATCTGTAGCGTCGATTCTGCGAGAATGCAATTTAGCCGTCATGGGTTTTTTCGTCGAACGA
Scytonema hyalinum sp. 1 CMT-1BRIN-NPC31	?????????CTCAATGCAAATTTACGGTCGTTAACCATAAATGTTTTGTCTTGGACGAGCCATATGTAGCGTCGATTCTGCGAGAATGCAATTTAGCCGTCATGGGTTTTTTCGCAAAACGA
Scytonema hyalinum sp. 1 CMT-1BRIN-NPC32	AAGTTTCGACTCAATGCAAATTTACGGTCGTTAACCATAAATGTTTTGTCTTGGACGAGCCATCTGTAGCGTCGATTCTGCGAGAATGCAATTTAGCCGTCATGGGTTTTTTCGTCGAACGA
Scytonema hyalinum sp. 1 CMT-1BRIN-NPC39	AAGTTTCGACTCAATGCAAATTTACGGTCGTTAACTATAAATGTTTTGTCTTGGACGAGCCATATGTAGCGTCGATTCTGCGAGAATGCAATTTAGCCGTCATGGGTTTTTTCGCAAAACGA
Scytonema hyalinum sp. 1 CMT-1SWIN-NPC17	?????????CTCAATGCAAATTTACGGTCGTTAACCATAAATGTTTTGTCTTGGACGAGCCATATGTAGCGTCGATTCTGCGAGAATGCAATTTAGCCGTCATGGGTTTTTTCGTCGAACGA
Scytonema hyalinum sp. 1 EM3-HA15	?AGTTTCGACTCAATGCAAATTTACGGTCGTATACCATAAATGTTTTGTCTTGGACGAGCCATCTGTAGCGTCGATTCTGCGAGAATGCAATTTAGCCGTCATGGGTTTTTTCGCAAAACGA
Scytonema hyalinum sp. 1 EM3-HA19	?AGTTTCGACTCAATGCAAATTTACGGTCGTATACCATAAATGTTTTGTCTTGGACGAGCCATCTGTAGCGTCGATTCTGCGAGAATGCAATTTAGCCGTCATGGGTTTTTTCGCAAAACGA
Scytonema hyalinum sp. 1 EM3-HA20	?AGTTTCGACTCAATGCAAATTTACGGTCGTATACCATAAATGTTTTGTCTTGGACGAGCCATCTGTAGCGTCGATTCTGCGAGAATGCAATTTAGCCGTCATGGGTTTTTTCGCAAAACGA
Scytonema hyalinum sp. 1 EM3-HA25	AAGTTTCGACTCAATGCAAATTTACGGTCGTATACCATAAATGTTTTGTCTTGGACGAGCCATCTGTAGCGTCGATTCTGCGAGAATGCAATTTAGCCGTCATGGGTTTTTTCGCAAAACGA
Scytonema hyalinum sp. 1 EM3-Z1_c02	?AGTTTCGACTCAATGCAAATTTACGGTCGTTAACCATAAATGTTTTGTCTTGGACGAGCCATCTGTAGCGTGCATTCTGCGGGAATGCAATTTAGCCGTCATGGGTTTTTTCGCAAAACGA
Scytonema hyalinum sp. 1 WJT4-NPBG1	AAGTTTCGACTCAATGCAAATTTACGGTCGTTAACCATAAATGTTTTGTCTTGGACGAGCCATCTGTAGCGTGCATTCTGCGAGAATGCAATTTAGCCGTCATGGGTTTTTTCGTCGAACGA
Scytonema hyalinum sp. 1 FI5-JRJ03_	?AGTTTCGACTCAATGCAAATTTACGGTCGTTAACCATAAATGTTTTGTCTTGGACGAGCCATATGTAGCGTCGATTCTGCGAGAATGCAATTTAGCCGTCATGGGTTTTTTCGCAAAACGA
Scytonema hyalinum sp. 1 WJT9-NPBG6A	AAGTTTCGACTCAATGCAAATTTACGGTCGTTAACTATAAATGTTTTGTCTTGGACGAGCCATATGTAGCGTCGATTCTGCGAGAATGCAATTTAGCCGTCATGGGTTTTTTCGCAAAACGA
Scytonema hyalinum sp. 1 WJT9-NPBG6B	AAGTTTCGACTCAATGCAAATTTACGGTCGTTAACTATAAATGTTTTGTCTTGGACGAGCCATATGTAGCGTCGATTCTGCGAGAATGCAATTTAGCCGTCATGGGTTTTTTCGCAAAACGA
Scytonema_hyalinum sp. 2 HK-05	AAGTTTCGACTCAATGCAAATTTACGGTCGTTAACCATAAATGTTTTGTCTTGGACGAGCCATCTGTAGCGTCGATTCTGCGAGAATGCAATTTAGCCGTCATGGGTTTTTTCGCAAAACGA
Scytonema hyalinum sp. 3 HAF2-B2-C1	?AGTTTCGACTCAATGCAAATTTACGGTCGTTAACCATAAATGTTTTGTCTTGGACGAGCCATCTGTAGCGTCGATTCTGCGAGAATGCAATTTAGCCGTCATGGGTTTTTTCGCAAAACGA
Scytonema hyalinum sp. 4 HTT-U-KK4	AAGTTTCGACTCAATGCAAATTTACGGTCGTTAACCATAAATGTTTTGTCTTGGACGAGCCATCTGTAGCGTCGATTCTGCGGGAATGCAATTTAGCCGTCATGGGTTTTTTCGCAAAACGA
Scytonema hyalinum sp. 5 HA4185-MV1	?AGTTTCGACTCAATGCAGAATAAGGGTCGTTAACCATAAATGTTTTGTCTTGGACGAGCCATCTGTAGCATCGATTCTGCGAGAATGCAGTTTAGCCGTCATGGGTTTTTTCGTCGAACGA
Scytonema hyalinum sp. 5 ATA-SAL-RM1	????TTCGACTCAATGCAGAATAAGGGTCGTTAACCATAAATGTTTTGTCTTGGACGAGCCATCTGTAGCATCGATTCTGCGAGAATGCAGTTTAGCCGTCATGGGTTTTTTCGTCGAACGA
Scytonema_arcangeli Valle de Zapoltlan	?AGTTTCGACTCAATGCAAATTTATGGTCGTTAACCATAAATGTTTTGTCTTGGACGAGCCATCTGTAGCATCGATTCCGCGGGAATGCAGTTTAGCCGTCATGGG?????????????????
Scytonema arcangeli FL17-MK96	?AGTTTCGACTCAATGCAAATTTATGGTCGTTAACCATAAATGTTTTGTCTTGGACGAGCCATCTGTAGCATCGATTCCGCGGGAATGCAGTTTAGCCGTCATGGG?????????????????
Brasilonema_BZ_HDL_007	GAGTTTCGACTGCTCCGGGGTATG--A-TAGTAATCGCGGTCCCCTTTTCCCAGAAGAATTGGACAGGATAGCGGCTCCGCGGGAGCGCGGCCAGGCTGAGG-ACACCCACCCTACTTGGTAG
Brasilonema_CR6-4B	?????????CTGCTCCGGGGTTGG--A-TAGTAATCGCGGTCCCCTTATCCCAGAAGAATTGGACAGGATAGCGGCTTCGCGGAAGCGCGGCCAGGCCGAGG-ACACCCACCCTGCAAGGTAG
Brasilonema_CR6-5A	GAGTTTCGACTGCTCCGGGGAACG--A-TAGTAATCGCGGTCCCCTTTTCCCAGAAGAATTGGACAGGATAGCGGCTTCGCGGAAGCGCGGCCAGGCCGAGG-ACACCCACCCTGCAAGGTAG
Brasilonema_KEN_MK50	GAGTTTCGACTGCTCCGGGGTATG--A-TAGTAATCGCGGTCCCCTTTTCCCAGAAGAATTGGACAGGAAAGCGGCTTCGCGGAAGCGCGGCCAGGCCGAGG-ACACCCACCCTCCAAGGTAG
Brasilonema_M31_F20B	GAGTTTCGACTGCTCCGGGGTATG--A-TAGTAATCGCGGTCCCCTTTTCCCAGAAGAGCTGGACAGGGCAGCGGCTCTGCGAGAACGCGGCCAGGCTGAGG-ACACCCACCCTCTCGGGTAG
Brasilonema_P09_MK13	GAGTTTCGACTGATCTGGGGTCGG--A-TGTTAGTCGCGGTCCCCTTTTCCCAGAAGAATTGGACAGGGCAGCGGCTCTGCGAGAGCGCGGCCAGACTGAGG-ACACCCACCCTCTCGGGTAG
Brasilonema_PT5_MK70	GAGTTTCGACTGATCTGGGATCGG--A-TGTTAGTCGCGGTCCCCTTGTCCCAGAAGAGCTGGACAGGGCAGCGGCTCTGCGAGAGCGCGGCCAGGCCGAGG-ACACCCACCCTGTCGGGTAG
Brasilonema_TH04_Ema	GAGTTTAGACTGATCTGGGGTAGG--A-TGTTAGTCGCGGTCCCCTTTTCCCAGAAGAATTGGACAGGATAGCGGCTCTGCGAGAACGCGGCCAGGCCGAGG-ACACCCACCCTCTCGGGTAG
Scytonema hofmannii_PCC7110	GACCCTAGGTTGCTTTGGGGATGG--G-CGGTAGCTGCGGACCCCTTTTCCCAGAAGAAATGGACAGGATTGGCGCCCGTGTGGGGCTAGGCCAGATTGTGG-ACACCAGTCTTATTCGGNAG
Scytonema hofmannii_FM5_MK45	?????????????????????????????????????GCGGCCCCCTTTACCCAGAAGAAATGGACAGGATTGGCGCCCGTGTGGGGCTAGGCCAGATTGTGG-ACACCAGTCTTATCGGGCAG
Scytonema fritschii_UCFS22	G-TTCAGGACTGCTCTGGGGAAAA--G-CGGTAGTTGCGGACCCCCAATCCCAGATAGATTGGACAGGAAAGGCGTTTTTGCAGAGCTAGGCCAGGCCGTGG-ACACCCACCCTC????????
Scytonema fritschii_UCFS23	G-TTCTAGACTGCTCTGGGGTTGG--G-CGGTAGTTGCGGACCCCCAATCCCAGATAGATTGGACAGGAAAGGCGTTTCTGTGGAGCTAGGCCAGGCCGTGG-ACACC???????????????