

## ON-LINE SUPPLEMENTARY MATERIAL

Verma, S., Vishwakarma, R., Bhowmik, A., Yuvraj Bagul, S., Chakdar, H., Siddiqui, N., Mageshwaran, V., Kumar Saxena, A.: Molecular and morpho-physiological analyses revealed inter- and intra-generic diversity of filamentous cyanobacteria from saline/alkaline soils. *Acta Botanica Croatica*, DOI: 10.37427/botcro-2026-005.

**On-line Suppl. Tab. 1.** Details of cyanobacterial cultures used in the study.

Sl. No.	Cyanobacterial isolates	NAIMCC Accession no.	Source of isolation	Location and geographical coordinates
1.	<i>Halomicronema</i> sp. K1	NAIMCC-C-00249	Garden soil	Kushmaur, U.P., India 25°53.815' N and 83°29.303' E
2.	<i>Desertifilum</i> sp. K4	NAIMCC-C-00251	Paddy field	Kushmaur, U.P., India 25°53.942' N and 83°29.257' E
3.	<i>Lyngbya</i> sp. K5	NAIMCC-C-00252	Paddy field	Kushmaur, U.P., India 25°53.942' N and 83°29.257' E
4.	<i>Phormidium</i> sp. K6	NAIMCC-C-00253	Paddy field	Kushmaur, U.P., India 25°53.942' N and 83°29.257' E
5.	<i>Aulosira laxa</i> K11	NAIMCC-C-00257	Pigeon pea field	Kushmaur, U.P., India 25°54.017' N and 83°29.300' E
6.	<i>Desertifilum</i> sp. K18	NAIMCC-C-00264	Pond	Mau, U.P., India 25°95.183' N and 83°55.231' E
7.	<i>Desertifilum</i> sp. K19	NAIMCC-C-00265	Garden soil	Kushmaur, U.P., India 25°53.815' N and 83°29.303' E
8.	<i>Desertifilum</i> sp. K20	NAIMCC-C-00266	Garden soil	Kushmaur, U.P., India 25°53.815' N and 83°29.303' E
9.	<i>Hapalosiphon</i> sp. K23	NAIMCC-C-00269	Paddy field	Kushmaur, U.P., India 25°53.942' N and 83°29.257' E
10.	<i>Aulosira laxa</i> K24	NAIMCC-C-00270	Pigeon pea field	Kushmaur, U.P., India 25°54.017' N and 83°29.300' E
11.	<i>Alkalinema pantanalense</i> K25	NAIMCC-C-00271	Paddy field	Alipur, U.P., India 25°90.619' N and 83°47.860' E
12.	<i>Aulosira laxa</i> K27	NAIMCC-C-00273	Pond	Mau, U.P., India 25°95.183' N and 83°55.231' E
13.	<i>Hapalosiphon</i> sp. K28	NAIMCC-C-00274	Garden soil	Kushmaur, U.P., India 25°53.815' N and 83°29.303' E
14.	<i>Aulosira laxa</i> K29	NAIMCC-C-00275	Paddy field	Kushmaur, U.P., India 25°53.942' N and 83°29.257' E
15.	<i>Phormidium</i> sp. K30	NAIMCC-C-00276	Pigeon pea field	Kushmaur, U.P., India 25°54.017' N and 83°29.300' E
16.	<i>Hapalosiphon</i> sp. K32	NAIMCC-C-00277	Paddy field	Alipur, U.P., India 25°90.619' N and 83°47.860' E
17.	<i>Aulosira laxa</i> K34	NAIMCC-C-00278	Paddy field	Kushmaur, U.P., India 25°53.942' N and 83°29.257' E
18.	<i>Aulosira laxa</i> K39	NAIMCC-C-00282	Pond	Mau, U.P., India 25°95.183' N and 83°55.231' E
19.	<i>Halomicronema</i> sp. K40	NAIMCC-C-00283	Pigeon pea field	Kushmaur, U.P., India 25°54.017' N and 83°29.300' E
20.	<i>Aulosira laxa</i> K44	NAIMCC-C-00285	Pigeon pea field	Kushmaur, U.P., India 25°54.017' N and 83°29.300' E
21.	<i>Aulosira laxa</i> K46	NAIMCC-C-00287	Pond	Mau, U.P., India 25°95.183' N and 83°55.231' E
22.	<i>Aulosira laxa</i> K48	NAIMCC-C-00288	Paddy field	Alipur, U.P., India 25°90.619' N and 83°47.860' E
23.	<i>Toxopsis calypsus</i> K49	NAIMCC-C-00289	Paddy field	Kushmaur, U.P., India 25°53.942' N and 83°29.257' E
24.	<i>Hapalosiphon</i> sp. K50	NAIMCC-C-00290	Pond	Mau, U.P., India 25°95.183' N and 83°55.231' E

On-line Suppl. Tab. 1. continued

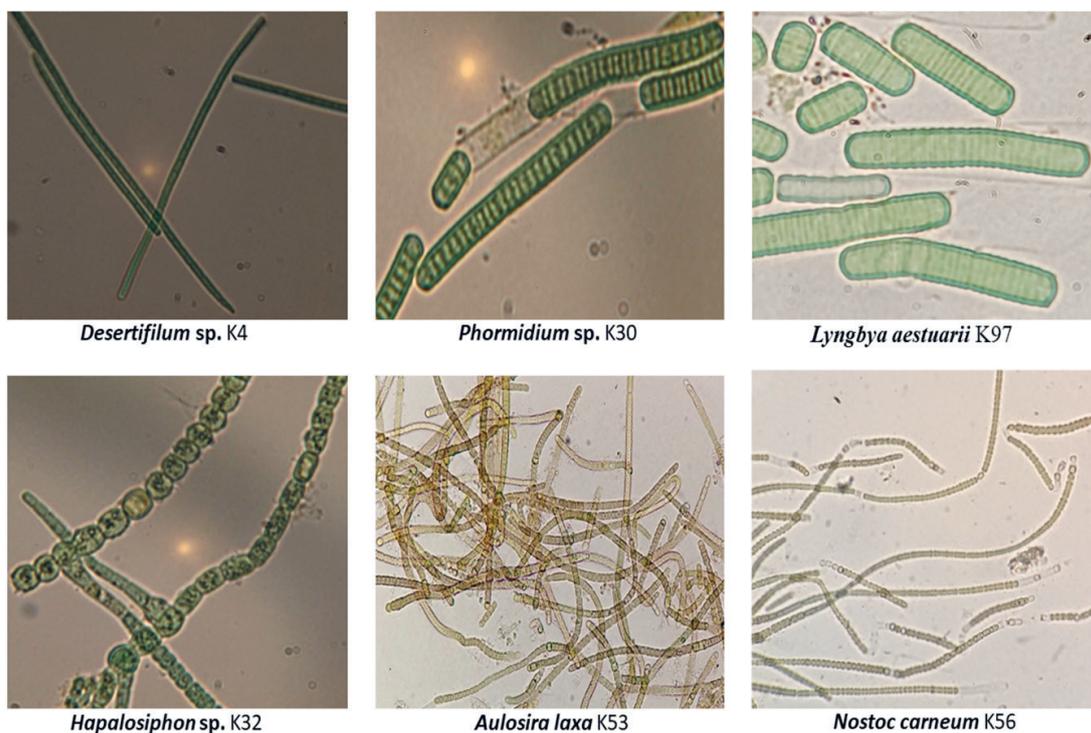
Sl. No.	Cyanobacterial isolates	NAIMCC Accession no.	Source of isolation	Location and geographical coordinates
25.	<i>Nostoc</i> sp. K51	NAIMCC-C-00291	Pigeon pea field	Kushmaur, U.P., India 25°54.017' N and 83°29.300' E
26.	<i>Aulosira laxa</i> K53	NAIMCC-C-00292	Pond	Mau, U.P., India 25°95.183' N and 83°55.231' E
27.	<i>Scytonema</i> sp. K55	NAIMCC-C-00294	Pond	Mau, U.P., India 25°95.183' N and 83°55.231' E
28.	<i>Nostoc carneum</i> K56	NAIMCC-C-00295	Pond	Mau, U.P., India 25°95.183' N and 83°55.231' E
29.	<i>Aulosira laxa</i> K57	NAIMCC-C-00296	Pond	Mau, U.P., India 25°95.183' N and 83°55.231' E
30.	<i>Aulosira laxa</i> K58	NAIMCC-C-00297	Pigeon pea field	Kushmaur, U.P., India 25°54.017' N and 83°29.300' E
31.	<i>Aulosira laxa</i> K59	NAIMCC-C-00298	Garden soil	Kushmaur, U.P., India 25°53.815' N and 83°29.303' E
32.	<i>Nostoc</i> sp. K60	NAIMCC-C-00299	Garden soil	Kushmaur, U.P., India 25°53.815' N and 83°29.303' E
33.	<i>Aulosira laxa</i> K61	NAIMCC-C-00300	Pigeon pea field	Kushmaur, U.P., India 25°54.017' N and 83°29.300' E
34.	<i>Hapalosiphon</i> sp. K62	NAIMCC-C-00301	Garden soil	Kushmaur, U.P., India 25°53.815' N and 83°29.303' E
35.	<i>Nostoc</i> sp. K67	NAIMCC-C-00305	Garden soil	Kushmaur, U.P., India 25°53.815' N and 83°29.303' E
36.	<i>Nostoc</i> sp. K68	NAIMCC-C-00306	Garden soil	Kushmaur, U.P., India 25°53.815' N and 83°29.303' E
37.	<i>Halomicronema</i> sp. K70	NAIMCC-C-00308	Paddy field	Alipur, U.P., India 25°90.619' N and 83°47.860' E
38.	<i>Leptolyngbya</i> sp. K72	NAIMCC-C-00310	Paddy field	Alipur, U.P., India 25°90.619' N and 83°47.860' E
39.	<i>Hapalosiphon</i> sp. K76	NAIMCC-C-00313	Garden soil	Kushmaur, U.P., India 25°53.815' N and 83°29.303' E
40.	<i>Toxopsis calypsus</i> K78	NAIMCC-C-00314	Paddy field	Kushmaur, U.P., India 25°53.942' N and 83°29.257' E
41.	<i>Halomicronema</i> sp. K79	NAIMCC-C-00315	Paddy field	Alipur, U.P., India 25°90.619' N and 83°47.860' E
42.	<i>Lyngbya wollei</i> K80	NAIMCC-C-00316	Paddy field	Alipur, U.P., India 25°90.619' N and 83°47.860' E
43.	<i>Lyngbya hieronymusii</i> K81	NAIMCC-C-00317	Paddy field	Alipur, U.P., India 25°90.619' N and 83°47.860' E
44.	<i>Aulosira laxa</i> K94	NAIMCC-C-00329	Paddy field	Alipur, U.P., India 25°90.619' N and 83°47.860' E
45.	<i>Lyngbya hieronymusii</i> K95	NAIMCC-C-00330	Paddy field	Alipur, U.P., India 25°90.619' N and 83°47.860' E
46.	<i>Lyngbya aestuarii</i> K97	NAIMCC-C-00332	Paddy field	Kushmaur, U.P., India 25°53.942' N and 83°29.257' E
47.	<i>Hapalosiphon</i> sp. K99	NAIMCC-C-00334	Paddy field	Kushmaur, U.P., India 25°53.942' N and 83°29.257' E

**On-line Suppl. Tab. 2.** Membership degrees matrix for heterocystous cyanobacteria.

Cyanobacterial strains	Cluster 1	Cluster 2	Cluster 3	Crisp or hard clustering number
K44	0.18	0.10	0.72	3
K58	0.03	0.02	0.95	3
K60	0.10	0.11	0.79	3
K59	0.07	0.06	0.87	3
K49	0.08	0.06	0.85	3
K11	0.07	0.06	0.87	3
K51	0.01	0.01	0.98	3
K61	0.07	0.05	0.88	3
K28	0.23	0.64	0.13	2
K62	0.03	0.96	0.01	2
K23	0.55	0.31	0.15	1
K29	0.03	0.02	0.95	3
K24	0.42	0.14	0.44	3
K34	0.15	0.11	0.73	3
K99	0.11	0.83	0.07	2
K78	0.07	0.07	0.86	3
K39	0.27	0.12	0.61	3
K94	0.05	0.03	0.92	3
K50	0.59	0.16	0.26	1
K68	0.35	0.26	0.39	3
K48	0.12	0.09	0.78	3
K32	0.72	0.22	0.06	1
K46	0.07	0.04	0.88	3
K27	0.19	0.13	0.68	3
K67	0.32	0.55	0.13	2
K76	0.84	0.11	0.05	1
K55	0.02	0.01	0.96	3
K57	0.02	0.01	0.97	3
K53	0.07	0.05	0.89	3
K56	0.01	0.00	0.99	3

**On-line Suppl. Tab. 3.** Membership degrees matrix for non-heterocystous cyanobacteria.

Cyanobacterial strains	Cluster 1	Cluster 2	Cluster 3	Crisp or Hard clustering number
K4	0.950	0.004	0.04	1
K6	0.879	0.008	0.113	1
K5	0.125	0.033	0.842	3
K1	0.026	0.002	0.972	3
K95	0.000	1.000	0.000	2
K70	0.320	0.016	0.665	3
K80	0.713	0.027	0.260	1
K72	0.010	0.001	0.989	3
K20	0.819	0.007	0.174	1
K19	0.006	0.001	0.993	3
K18	0.717	0.009	0.274	1
K81	0.904	0.007	0.089	1
K79	0.037	0.002	0.96	3
K40	0.494	0.009	0.497	3
K30	0.027	0.003	0.970	3
K25	0.971	0.002	0.026	1
K97	0.813	0.016	0.171	1



**On-line Suppl. Fig. 1.** Photomicrograph of selected cyanobacterial isolates procured from NAIMCC at 400× and 1000× magnification. Photomicrograph of *Desertifilum* sp. K4, *Aulosira laxa* K53 and *Nostoc carneum* K56 were captured at 400× magnification whereas photomicrograph of *Phormidium* sp. K30, *Lyngbya aestuarii* K97 and *Hapalosiphon* sp. K32 were captured at 1000× magnification