PROFILE

NAME: Dr. Sukumar Bhakta

DESIGNATION : Botanical Assistant

YEAR OF BIRTH : 1984

FIELD OF SPECIALIZATION: Taxonomy of microalgae and cyanobacteria

SPECIAL INTEREST : Extremophilic algal taxonomy

PRESENTLY WORKING ON FAMILY / TRIBE / GENUS OR FLORA OF (AREA) : Thermophilic and Psychrophilic cyanobacteria and microalgae from thermal springs and from Antarctica respectively.

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ON GOING OTHER PROJECTS: Ecology and Taxonomy of psychrophilic benthic and lithic algal community from inland Antarctica (Project Code – Ant/2017/BES-07)

Duration: 3 years

COMPLETED PROJECTS:

Biodiversity assessment of microalgae from thermal springs of Maharashtra.

Duration: 3 years (2016-2019).

LIST OF PUBLICATIONS:

A. Research articles/papers:

BHAKTA, S., PRADHAN, J., SAHU, E. AND BASTIA, A. K**.** 2018. Salt stress response of diazotrophic cyanobacteria *Nostoc* sp. for their pigments and macromolecular contents. *"NPI" Int. Res. J. Ind. Env. Biotech.* 01: 119-132 (**ISSN**: 2581-7906).

SAHU, E., GIRI, D., BHAKTA, S., PANDA, S. AND BASTIA, A. K. 2017. Phytochemical screening of a corticolous cyanobacterium *Hassalia byssoidea* Hass. ex Born. et Flah. for

antibacterial and antioxidant activity. *World J. Pharm. Pharm. Sci*. 6 (3): 1161-1172. (ISSN 2278 – 4357; SJIF Impact Factor 6.647).

BHAKTA, S., DAS, S. K. AND ADHIKARY, S. P. 2016. Algal Diversity in hot springs of Odisha. *Nelumbo*, 58:157-173. (ISSN 0976 - 5069)

BHAKTA, S., DUTTA, P., SAHU, E. AND BASTIA, A. K. 2015. Soil crust algae of Similipal Biosphere Reserve (SBR), Odisha, *J. Adv. Microbiol.* 2: 54-63 (ISSN 2349 - 7785).

KUMAR, D., KESHARI, N., DAS, S. K., BHAKTA, S. AND ADHIKARY, S. P. 2014. Algal diversity of different habitats of Santiniketan, West Bengal, *J. Bot. Soc. Bengal*. 68: 47-57 (ISSN 0971 - 2976).

BHAKTA, S. AND ADHIKARY, S. P. 2014. Algal diversity from the streams and waterfalls of eastern and north eastern regions of India, *Nelumbo* 56: 1-47 (ISSN 0976 – 5069; DOI: 10.20324/nelumbo/v56/2014/86674 ISSN 0976-5069).

BHAKTA, S., PATTANAIK, L., DUTTA, P., SAHU, E. AND BASTIA, A. K. 2014. Diversity of corticolous algae from Similipal Biosphere Reserve, Mayurbhanj, Odisha, *Phykos* 44: 9-16 (ISSN 0554 - 1182).

BHAKTA, S. AND ADHIKARY, S. P. 2013. Two new records of *Ecballocystopsis* (Chlorococcales, Chlorophyceae) from lotic habitats of eastern region of India, *Nelumbo* 55: 181-184 (ISSN 0976 – 5069; DOI: 10.20324/nelumbo/v55/2013/73006; ISSN 0976-5069).

BHAKTA, S. AND ADHIKARY, S. P. 2012. Algal diversity in two major rivers of Eastern India and phycological assessment of their pollution. *The Ecoscan* spl. Issue 1: 7-14 (ISSN 0974 - 0376).

PANDA, H. S., NAYAK, M., DAS, B., PARIDA, B. K., JENA, J., BHAKTA, S., PANDA, S., PANDA, P. K. & SUKLA, L. B. 2011. Survey and documentation of brackish water algal diversity from east coast region of Odisha, India. *World Environ.* 1: 20-23 (ISSN 2163 - 1581).

NAYAK, M, JENA, J., BHAKTA, S., RATHA, S., PRADHAN, N., THIRUNAVOUKKARASU, M., MISHRA, S. K., PANDA, P. K., SUKLA, L. B. AND MISHRA, B. K. 2011. Screening of fresh water microalgae from eastern region of India for sustainable biodiesel production.

International journal of green energy, 8: 669-683. doi.org/10.1080/15435075.2011.588764 (ISSN 1543-5075).

BHAKTA, S., NAYAK, M., JENA, J., PANDA, P. K. & SUKLA, L. B. 2011. Phyco-diversity assessment of Bahuda river mouth areas of Odisha. *Recent Research in Science and Technology*, 3: 80-89 (ISSN 2076 - 5061).

DAS, S.K., BHAKTA, S. AND ADHIKARY, S. P. 2010. Algae of Tripura. *J. Indian Bot. Soc.* 89: 434-457 (ISSN 0019 – 4469; SJIF-6.8).

BHAKTA, S., DAS, S. K. AND ADHIKARY, S. P. 2010. Freshwater algae of Sikkim. *J. Indian Bot. Soc.* 89: 169-184 (ISSN 0019 – 4469; SJIF-6.8).

B. Books:

NIl

C. Book chapters:

DUTTA, P., BHAKTA, S., SAHU, E., BHUYAN, P. AND BASTIA, A. K. 2019. Analysis of growth and biochemical contents of microalgae grown with waste water effluent of Paper Mill, Balasore. In - *The Role of Microalgae in Wastewater Treatment*, Sukla, L. B., Subudhi, E. and Pradhan, D. (eds), Spinger nature, Singapore Pte Ltd. 155-170. doi.org/10.1007/978-981-13-1586-2 (ISBN 978-981-13-1585-5).

BHAKTA, S., SIPRA, B. S. AND BASTIA, A. K. 2016. Secondary metabolite and perspectives of microalgae, In: Recent Advances in Natural Products, Studium Press, New Delhi, Pp 340-365. (ISBN 10: 1-62699-060-3)

BHAKTA, S., SAHU, E. AND BASITA, A. K. 2013. Cyanobacteria and Micro algae: A potential source of bioactive metabolites, In *Natural Products – Drug Development*, 21-39pp. (ISBN 13: 978-93-80012-65-0).

BHAKTA, S., DEY, H. AND BASTIA, A. K. 2008. Study of algal diversity from rice fields of Baripada, Mayurbhanj, Orissa. In: M.K. Das, (Ed.), *Environmental Biotechnology and Biodiversity Conservation*, Daya Publishing House, New Delhi, India. Pp.154-163 (ISBN 978–81–7035–529-8).

D. Hindi articles: *Nil*

E. Popular articles:

1. Article entitled "Indian Scientist discovers rock eating algae", *The Times of India*, Pune edition entitled dated 28.09.2019.

2. Article entitled "Scientists find algae from warm regions growing in Antarctica", *The Times of India*, Pune edition entitled dated 27.05.2019.

3. Article entitled "Maha hotsprings facing extinction", *The Times of India*, Pune edition entitled dated 18.05.2019.

SIGNIFICANT CONTRIBUTIONS:

A. New taxa described:

1. *Ecballocystopsis himalayansis* Bhakta &Adhikary 2013

2. *Ecballocystopsis dichotomus* Zheng-YuetLie-Jue var. *minuta* Bhakta & Adhikary 2013

B. New distributional records to India and region:

First record to India – **100**

First record to Eastern regions of India (including Odisha, West Bengal and Northeast states) – **90**

Table- 1: New distributional record of algal taxa from the lotic water bodies (including hot springs) for India and for the eastern regions of India (ERI) including Odisha, West Bengal.

Sl. No	Algal taxa first record to India and to Eastern regions of India	India	ERI
1	**Cyanophyta (Cyanoprokaryota/ Cyanobacteria)** *Aphanocapsa conferta* (W. *et* G.S. West) Komárková – Legnerová *et* Cornberg	+	-
2	*Aphanocapsa parietina* Nägeli	+	-
3	*Woronichinia fremyi* (Komárek) Komárek et Hindák	+	-
4	*Microcystis smithi* Komárek et Anagnostidis	+	-
5	*Gloeocapsa crepidinum* Thuret	-	+
6	*Gomphosphaeria aponina* Kützing	-	+
7	*Chroococcus dispersus* (Keissler) Lemmermann	-	+
8	*Chroococcus prescottii* Drouet et Daily	+	-
9	*Cyanosarcina fontana* Kovácik	+	-
10	*Geitleribactron periphyticum* Komárek	+	-
11	*Chamaesiphon confervicola* var. *elongatus* (Nordstedt) Kann	+	-
12	*Chroococcidiopsis fissurarum* (Ercegović)Komárek et	+	-

	Anagnostidis		
13	*Pleurocapsa concharum* Hansgirg	+	-
14	*Coelosphaerium goetzei* Schmidle	-	+
15	*Pseudanabaena batrachospermorum* (Skuja) Anagnostidis et Komárek	+	-
16	*Pseudanabaena contorta* Kling et Watson	+	-
17	*Pseudanabaena lonchoides* Anagnostidis	+	-
18	*Pseudanabaena thermalis* Anagnostidis	-	+
19	*Geitlerinema acutissimum* (Kufferath) Anagnostidis	-	+
20	*Geitlerinema lemmermanii* (Woloszyńska) Anagnostidis	+	-
21	*Geitlerinema splendidum* (Greville ex Gomont) Anagnostidis	+	-
22	*Geitlerinema thermale* Anagnostidis	+	-
23	*Limnothrix guttulata* (Van Goor) Umezaki et M. Watanabe	+	-
24	*Limnothrix planktonica* (Woloszyńska) Meffert	+	-
25	*Limnothrix redekei* (Van Goor) Meffert	+	-
26	*Planktolyngbya circumcreta* (G.S. West) Anagnostidis et Komárek	+	-
27	*Leibleinia calotrichicola* (Copeland) Anagnostidis et Komárek	+	-
28	*Leptolyngbya terebrans* (Bornaet et Flahault ex Gomont) Anagnostidis et Komárek	+	-
29	*Leptolyngbya copelandii* Anagnostidis	+	-
30	*Leptolyngbya subuliformis* (Gomont) Anagnostidis	+	-
31	*Spirulina flavovirens* Wislouch	+	-
32	*Spirulina laxa* G.M. Smith	+	-
33	*Arthrospira santannae* Komárek et Komarkova-Legnerova	+	-
34	*Hormothece banyolensis* (Margalef) Komárek et Anagnostidis	+	-
35	*Homoeothrix janthiana* (Bornet *et* Flahault) Starmach	+	-
36	*Homoeothrix poljanskii* Muzafarov	+	-
37	*Homoeothrix varians* Geitler	+	-
38	*Schizothrix friesii* (Ag.) Gomont	-	+
39	*Komvophoron constrictum* (Szafer) Anagnostidis *et* Komárek	+	-
40	*Planktothrix planktonica* (Elenkin) Anagnostidis *et* Komárek	+	-
41	*Phormidium crassior* (Behre) Anagnostidis	+	-
42	*Phormidium koprophilum* (Skuja) Anagnostidis	+	-
43	*Phormidium minnesotense* (Tilden) Drouet	+	-
44	*Phormidium numidicum* (Gomont sensu Welsh) Angnostidis	+	-
45	*Phormidium puteale* (Montagne ex Gomont) Anagnostidis et Komárek	+	-
46	*Phormidium terebriforme* (Agardh ex Gomont) Anagnostidis et Komárek	+	-
47	*Oscillatoria brevis* sensu Claus	-	+
48	*Oscillatoria fulgens* Böcher	+	-
49	*Oscillatoria jenensis* Schmidle	-	+
50	*Lyngbya holdenii* Forti	-	+
51	*Lyngbya latissima* Prescott	+	-
52	*Lyngbya splendens* Gardner	+	-
53	*Scytonema pseudohofmanni* Bharadwaja	-	+

54	*Scytonema saleyeriense* var. *indica* Bharadwaja	-	+
55	*Calothrix fusca* (Kütz.) Bornet et Flahault.	-	+
56	*Dichothrix fusca* Fritsch	-	+
57	*Dichothrix ledereri* Skacelova	+	-
58	*Dichothrix orsiniana* (Kützing) Bornet et Flahault	-	+
59	*Dichothrix spiralis* Fritsch	+	-
60	*Rivularia mesenterica* Thuret	+	-
61	*Anabaena variabilis* Küetz. Ex Born et Flah. var. *kashiensis* (Bharadwaja) Fritsch	-	+
62	**Phylum – Rhodophyta** *Audouinella eugenea* (Skuja) Jao	 +	 -
63	**Phylum – Chlorophyta** *Mougeotia bangalorensis* Iyengar	-	+
64	*Spirogyra affinis* (Hassall) Petit	-	+
65	*Spirogyra oblata* Jao	-	+
66	*Spirogyra parvula* (Transeau) Czurda	-	+
67	*Spirogyra pseudoreticulata* Krieger	+	-
68	*Spirogyra rhizoids* Randhawa	-	+
69	*Spirogonium sticticum* (Engl. Bot.) Kützing	-	+
70	*Cylindrocystis obesa* West & G. S. West	-	+
71	*Cylindrocystis ovalis* Turner	-	+
72	*Penium cucurbitinum* var. *subpolymorphum* Nordst	+	-
73	*Penium margaritaceum* Ralfs	-	+
74	*Penium navicula* Bréb.	+	-
75	*Staurastrum bieneanum* Rabenhorst var. *ellipticum* Wille fa. Skuja	-	+
76	*Staurastrum donardense* W. & G. S. West	+	-
77	*Staurastrum manfeldtii* Delp.	-	+
78	*Staurastrum striolatum* (Näg.) Arch.	-	+
79	*Cosmarium angulatum* (Perty) Rabenhorst	-	+
80	*Cosmarium dentiferum* Corda	+	-
81	*Cosmarium eductum* Roy & Biss	+	-
82	*Cosmarium granulatum* Brebission in Ralfs var. *ocellatum* W. et G.S. West	+	-
83	*Cosmarium maculiforme* Schmidle	-	+
84	*Cosmarium occidentale var. ornatum* Turner	+	-
85	*Cosmarium praecisum* Borge	-	+
86	*Cosmarium quadrifarium* var. *oblonga* Kant and Gupta	-	+
87	*Cosmarium quadrum* Lund var. *andamanicum* Prasad et Mishra	-	+
88	*Cosmarium radiosum* Wolle	-	+
89	*Cosmarium reniforme* (Ralfs) Arch. var. *elevatum* W. Et G. S. West	-	+
90	*Cosmarium turgidum* (Breb.) Ralf var. *subrotundatum* West & West	-	+
91	*Actinotaenium cucurbita* (Brebission) Teiling	+	-
92	*Radiofilum transversalis* (Brébisson) Ramanathan	-	+
93	*Cladophora bombayensis* Boergesen	-	+
94	*Pediastrum simplex var. biwanse* Fukusima	+	-

95	*Pediastrum tetras* var. *tetraodon* (Corda) Hansgirg	-	+
96	*Ecballocystopsis dichotomus* Hu Zheng-Yu	+	-
97	*Pseudodictyosphaerium lacunare* Hindák	+	-
98	*Pseudodictyosphaerium minusculum* Hindák	+	-
99	*Scenedesmus brasiliensis* Bohl. *var. brasiliensis*	-	+
100	*Scenedesmus ecornis* var. *ecornis* Chodat	+	-
101	*Scenedesmus ellipticus* Corda	-	+
102	*Scenedesmus magnus* Meyen	+	-
103	*Scenedesmus hunanensis* Jao	+	-
104	*Neodesmus danubialis* Hindák	+	-
105	*Monoraphidium fontinale* Hindák	+	-
106	*Microspora wittrockii* (Wille) Lagerheim	-	+
107	*Leptosira mediciana* Kant and Gupta	-	+
108	*Oedogonium chaetophorum* var. *chaetophorum* Hoffman	+	-
109	*Oedogonium crispum* (Hassall) Wittrock var. *gracilescens* Wittrocks	-	+
110	*Oedogonium pisanum* (Wittrock) Hirn	-	+
111	*Oedogonium tiffanyi* Ack.	-	+
112	*Oedogonium wyliei* Tiffany	-	+
113	*Phycopeltis epiphyton* Millard	-	+
114	**Phylum – Euglenophyta** *Euglena caudata* var. *minor* Deflandre	-	+
115	*Euglena grisoli* Deflandre	-	+
116	*Euglena navicula* Zakryś	+	-
117	*Trachelomonas bacilifera* Playfair var. *minima* f. *minima* Playfair	-	+
118	*Trachelomonas erecta* Skvortzow	+	-
119	*Trachelomonas rolli* DEFL. Nach Roll.	-	+
120	*Trachelomonas volvocinopsis* Swirenko	-	+
121	**Phylum – Heterokontophyta (Bacillariophyceae)** *Melosira binderana* Kützing	+	-
122	*Melosira decussata* Kützing	-	+
123	*Melosira granulata* (Ehrenberg) Ralfs var. *muzzanensis* Meister	-	+
124	*Melosira varians* var. *aequalis* Kützing	-	+
125	*Cyclotella operculata* Kützing	-	+
126	*Coscinodiscus jonesianus* (Grev.) Ostenf. Nancowry	-	+
127	*Coscinodiscus subtilis* Ehr.	-	+
128	*Cocconeis striata* Ehrenberg	+	-
129	*Fragilaria intermedia* (Grünow) var. *robusta* Venkataraman	-	+
130	*Synedra dorsiventrlis* Otto Müller	-	+
131	*Synedra gallionii* Kützing	+	-
132	*Synedra parvula* Kützing	+	-
133	*Synedra voucheriae* (Kützing) Kützing	+	-
134	*Micromega tenellum* Kützing	+	-
135	*Diatoma pectinale* Kützing	+	-
136	*Achnanthes coarctata* var. *parallela* Venkataraman	-	+
137	*Achnanthes lanceolata* (Brébisson) Grunow var. *rostrata*	-	+

	Hustedt		
138	*Achnanthes linearis* (W. Smith) Grunow	-	+
139	*Achnanthes minutissima* Kützing	-	+
140	*Achnanthes subsessilis* Kützing	-	+
141	*Diploneis elliptica* (Kützing) Cleve	-	+
142	*Diploneis puella* Schumann	-	+
143	*Diploneis subovalis* Cleve	-	+
144	*Stauroneis birostris* Ehrenberg	+	-
145	*Caloneis bacillum* (Grunow) Cleve	-	+
146	*Pinnularia acrosphaeria* (Brebission) W. Smith f. *undulata* Cleve	-	+
147	*Pinnularia microstauron* (Ehernberg) Cleve	-	+
148	*Pinnularia peruviana* Ehrenberg	+	-
149	*Pleurosigma speciosum* Wm. Smith	-	+
150	*Navicula acrosphaeria* Kützing	+	-
151	*Navicula anglica* Ralfs	+	-
152	*Navicula aponina* Kützing	+	-
153	*Navicula brebissonii* Kützing	+	-
154	*Navicula cryptocephala* Kützing	-	+
155	*Navicula exigua* (Gregory) Grunow in Van Heurck	-	+
156	*Navicula exilis* Kützing	+	-
157	*Navicula gonzalvensiana* Gandhi	-	+
158	*Navicula lunata* Kütz.	+	-
159	*Navicula rhomboides* Kützing	+	-
160	*Navicula rostellata* Kützing	+	-
161	*Navicula scalprum* Kütz.	+	-
162	*Navicula spicula* (Dickie) Cleve var. *pulneyensis* Krishnamurthy	-	+
163	*Navicula truncata* Küetz.	+	-
164	*Navicula vanhaeffeniformis* Gandhi	-	+
165	*Gomphonema exiguum* Kützing	-	+
166	*Gomphonema intricatum* Kützing	-	+
167	*Gomphonema lanceolatum* Her f. *turris* (Ehr.) Hustedt	-	+
168	*Gomphonema micropus* Kützing	-	+
169	*Gomphonema minutissimum* Grevilei	+	-
170	*Gomphonema telegraphicum* Kützing	+	-
171	*Cymbella aspera* (Ehr.) Cl.	+	-
172	*Bacillaria paradoxa* Kützing	-	+
173	*Nitzschia closterium* (Ehrenberg) W. Smith	-	+
174	*Nitzschia constricta* (Gregory) Grunow	+	-
175	*Nitzschia filiformis* (W. Smith.) Hust.	-	+
176	*Nitzschia frustulum* (Kuetz.) Grun.	+	-
177	*Nitzschia incurva var. lorenziana* (Grun.) Ross	+	-
178	*Nitzschia intermedia* Hantzsch	-	+
179	*Nitzschia kützinghiana* Hilse	+	-
180	*Nitzschia vasnii* Gandhi	+	-
181	*Sphenella angustata* Kützing	+	-
182	*Sphenella rostellata* Kützing	+	-

183	*Epithemia gibberula* Kütz.	-	+
184	*Epithemia gibberula* var. *producta* Grunow	+	-
185	*Epithemia turgida* Kützing	-	+
186	*Surirella euglepta* Ehrenberg	+	-
187	*Surirella robusta f. minor* Gandhi	-	-
188	*Surirella splendida* Kützing	+	-
189	*Rhopalodia gibberula* (Ehrenberg) Müller	+	-
190	**Class – Xanthophyceae** *Tribonema vulgare* Pascher	+	-

C. Any other novelties: Nil