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Cover: Orange Oakleaf *Kallima inachus* with colour pencils and watercolor wash by Elakshi Mahika Molur adapted from a workshop by Lenin Raj.



Rare desmid genus *Bourrellyodesmus* Compère (Chlorophyceae: Desmidiales: Desmidiaceae) in India with description of a new species (*Bourrellyodesmus indicus* Das & Keshri sp. nov.) from eastern Himalaya, India

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According to Algaebase (2022) *Bourrellyodesmus* Compère is represented by nine species. The genus was established by Compère (1976) to accommodate certain species of *Arthrodesmus* Ralfs. Compère (1976) however reconstructed just one species of *Arthrodesmus* Ralfs (*A. heimii* Bourrelley) to *Bourrellyodesmus heimii* (Bourrelley) Compère on the basis of the presence of thickened membrane in the middle of the semicells, covered with warts or scrobiculations and having unispinous angles put as diagnostic character of the genus (Compère 1976). Later on Bicudo & Compère (1978) proposed four more combinations, viz., *B. excrescens* (Scott & Grönblad) C.Bicudo & Compère, *B. jolyanus* (C. Bicudo & Azevedo) C.Bicudo & Compère, *B. spechtii* (Scott & Prescott) C.Bicudo & Compère, and *B. sumatranus* C.Bicudo & Compère as good species under this genus. Faustino & Bicudo (2004) added another species to this list, namely, *B. guarrerae* Faustino & C.Bicudo from São Paulo, Brazil. Ramos et al. (2022) redesignated two taxa of *Xanthidium* Ehrenberg ex Ralfs viz. *X. tenuissimum* Kurt Förster var. *amazonense* Kurt Förster and *Xanthidium tenuissimum* Kurt Förster

var. *constrictum* Kurt Förster to *B. amazonensis* (Kurt Förster) G. Ramos, C.Bicudo & Moura and *B. constrictus* (Kurt Förster) G. Ramos, C. Bicudo & Moura, respectively on the basis of their observations about the taxa. The characters of the taxa actually tallies with the genus *Bourrellyodesmus*. This year Santos et al. (2022) described a new species namely as *B. comperei* Santos & Moura from Caatinga domain, northeastern Brazil.

During our extensive investigations to the desmid flora of Sikkim Himalaya (Das & Keshri 2016), we had observed this curious genus. Although this taxon although resembles *Bourrellyodesmus*, it does not tally with any described species of the genus. It is also interesting that this genus is being recorded for the first time from the Indian subcontinent.

To the native people of Sikkim mountain lakes are of enormous value for their existence. They worship these water bodies and so the live forms inhabit therein. Among several lakes present in this state, 'Betangcho' or 'Elephanta lake' is unique with respect to its water microflora. Above 150 taxa of phytoplanktons were identified from a single lake (Das & Keshri 2012,

Editor: Anonymity requested.

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2016). This high altitude lake is situated in East Sikkim District with an altitude about 4,150 m from sea level and between 27.3337–27.3261 E & 88.8439–88.8487 N. Being situated in such high altitude the area nearby the lake is almost bare. Only a few small herbs and grasses grow here and there. A few algal masses grow in benthic or semi-benthic conditions. Phytoplankton frequently found along with these aquatic or semi-aquatic weeds. In the winter season the lake is completely covered with ice.

Samples were collected simply by hand from different accessible spots of the lake. Totally, nine collections were made. Several samples, i.e., visible algal mat or lumps floating on the surface of the water and also in association with aquatic herbs were collected and immediately fixed on the spot by 5% formalin aqueous solution. In another bottle water sample was preserved with 1% Lugols' iodine to study the microscopic phytoplanktons. Detailed ecological observation recorded in field notebook with water temperature and pH of the water measured by standard thermometer and standard universal pH indicator of Merck (Das &

Keshri 2016). Observations were made in the laboratory under Olympus GB compound microscope with GWF as mountant medium (Bando 1988). Photomicrographs were also taken using Zeiss Axiostar plus research microscope with Nikon SLR camera attachment system.

***Bourrellyodesmus indicus* Das & Keshri sp. nov.**
(Image 1 A–C)

Material examined

Holotype: No. DD-380(c), 06 November 2009, India, Sikkim, East Sikkim, Betangcho Lake, (27.3337–27.3261 N & 88.84397–88.8487 E), deposited in the Herbarium of Phycology Section, CAS in Botany, The University of Burdwan, West Bengal (BURD), coll. D. Das & J.P. Keshri.

Cells 1.1–1.3 times broader than long, semicells elliptical, apical margin rounded, curved downward continued to the spines, basal margin convex, angles with 1 solid convergent, short spine; sinus deep, open, V-shaped; cells elliptical in apical view, cell wall minutely punctate, each semicell with a lump of small facial granules in the centre; chloroplast and pyrenoid not

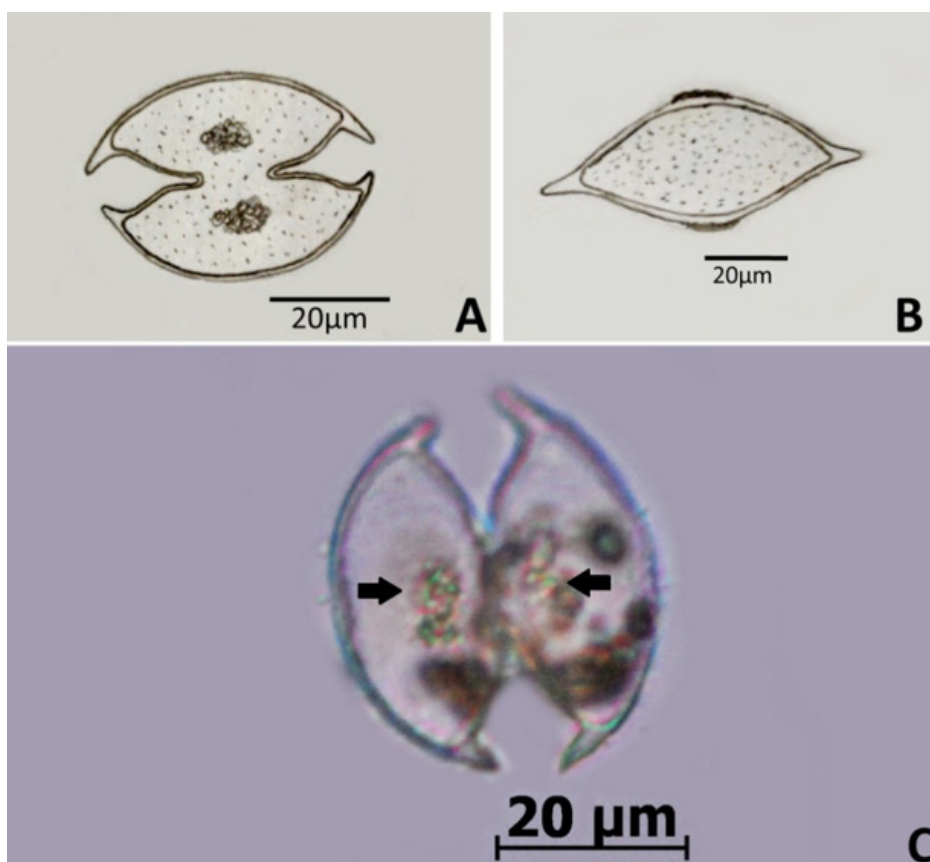


Image 1. A & B—Free hand drawing of *Bourrellyodesmus indicus* sp. nov. (A—front view | B—top view) | C—Photograph of *Bourrellyodesmus indicus* sp. nov. © A&B—Debjyoti Das, C—Jai Prakash Keshri.

Table 1. Comparison between existing species of *Bourrellyodesmus* with the proposed species.

	Shape of the semicells	Ornamentation on the upper lateral angles	Sinus	Lateral spine	Ornamentation on the face of the semicell
<i>B. amazonensis</i> (Kurt Förster) G.J.P. Ramos, C.E.M. Bicudo & C.W.N. Moura	Hexagonal	No ornamentation	Open, shallow	Short, blunt, parallel	Small rounded granule, single
<i>B. constrictus</i> (Kurt Förster) G.J.P. Ramos, C.E.M. Bicudo & C.W.N. Moura	Trapiziform	No ornamentation	Open, V-shaped	Short, blunt, parallel	Small rounded granule, single
<i>B. comperei</i> M.A. Santos & C.W.N. Moura	Trapiziform	1 tiny granules in each side of the semicell	Closed, deep	Short, blunt, downward	Small intumescence, single
<i>B. spechtii</i> (A.M.Scott & Prescott) C.E.M.Bicudo & Compère	Subrectan-gular	No ornamentation	Closed	Long, vertical	Small intumescence, single
<i>B. sumatranus</i> C.E.M.Bicudo & Compère	Pyramidal with convex apex	No ornamentation	Closed	Short, acute, parallel to slightly convergent	Rounded median protuberance, single
<i>B. excrescens</i> (Scott & Grönblad) C.E.M.Bicudo & Compère	Elliptic	No ornamentation	Open, V-shaped	Short, acute, parallel to slightly divergent	Rounded tubercle, single
<i>B. heimii</i> (Bourrelley) Compère	Elliptic	No ornamentation	Open, V-shaped	Blunt, convergent	Large granules with triangular scrobiculation, several in number
<i>B. guarrerae</i> Faustino & C.E.M.Bicudo	Elliptic to sub-circular	No ornamentation	Open, acute angled	Acute, subparallel	Small rounded granules, single
<i>B. jolyanus</i> (C.E.M.Bicudo & Azevedo) C.E.M.Bicudo & Compère	Elliptic	2 rounded granules in each side of the semicell	Open, V-shaped	Acute, long, convergent	Small median swelling, single
<i>B. indicus</i> sp. nov.	Elliptic	No ornamentation	Open, V-shaped	Blunt, convergent	Lump of small facial granules

observed; zygospore was also not found. Cell dimension: length 34–36 µm, width without spines 30–32 µm, with spines 39–41 µm. isthmus 11–12 µm. spines length 4–6 µm.

Habitat: New taxa rarely found in the study area, in association with other filamentous algae *Spirogyra* attached to the surface of the submerged aquatic plants. pH: 6, water temperature 10°C at the time of collection.

Differential diagnosis: In respect to shape of the semicell present taxa resembles *B. excrescens* (Scott & Grönblad) C.Bicudo & Compère and *B. heimii* (Bourrelley) Compère as these species possess elliptical semicells with rounded or convex apex. Although *B. guarrerae* Faustino & C.Bicudo possess elliptic or circular semicells but lateral spines are subparallel here and also cell dimension is smaller. *B. jolyanus* (C.Bicudo & Azevedo) C.Bicudo & Compère despite having elliptical semicells but also possess rounded granules at the upper lateral

margins which are absent in *B. indicus*.

Our taxa differs from *B. excrescens* (Scott & Grönblad) C.Bicudo & Compère in having a large emarginate tubercle on the faces of both sides of the semicells and downwardly curved spines.

B. heimii shows close resemblance to the present taxa having similar semicell shape and nature of the spines. Main dissimilarities of *B. heimii* have been noticed is the presence of just a lump of small facial granules on each side of semicell in place of several large granules alternating with triangular scrobiculations. *B. indicus* is also smaller.

A comparative account of the taxa is appended in Table 1.

Genus *Bourrellyodesmus* is being reported for the first time from India as well as eastern Himalayan alpine region. As this region is among the major hotspots of the world, further and more detail observations my reveal

more such plant sciences.

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