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. amazoneense 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,
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.  
(Images 1 A–C)

**Material examined**


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

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![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.](image-url)
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 10ºC 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 form 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

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

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

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