

***NITELLA ZAMANII* SP. NOV. (CHAROPHYTA) FROM BANGLADESH**

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Abstract

Nitella zamanii has been described and illustrated as a new species from a rice field at Charchat upazila in Bangladesh. The new species resembles *Nitella furcata* and *N. polycarpa* but differs by presence of accessory branchlets, spiky dactyls and size of oogonium, oospore and antheridium.

Introduction

Nitella Ag. had been described by different researchers (Islam and Sarma, 1976; Aziz and Tanbir, 2003; Islam and Irfanullah, 2005; Aziz, 2009; Naz *et al.*, 2009; Diba and Naz, 2011) from different parts of Bangladesh and morphologically described with their habitats. A new species of *Nitella* is presented in this paper with illustration. This *Nitella* species was collected from a rice field at Rajshahi district in Bangladesh. A total of seventeen taxa of *Nitella* have been so far reported from Bangladesh (Naz *et al.*, 2011).

Specimens were collected from only one location and 10 cm depth of water by hand and preserved in Transeau's solution (Transeau, 1916).

Class: Charophyceae; Order: Charales; Family: Characeae; Genus: *Nitella* Ag.

***Nitella zamanii* Naz, Diba & Schubert, sp. nov.**

(Figs 1-14; Pl. 1).

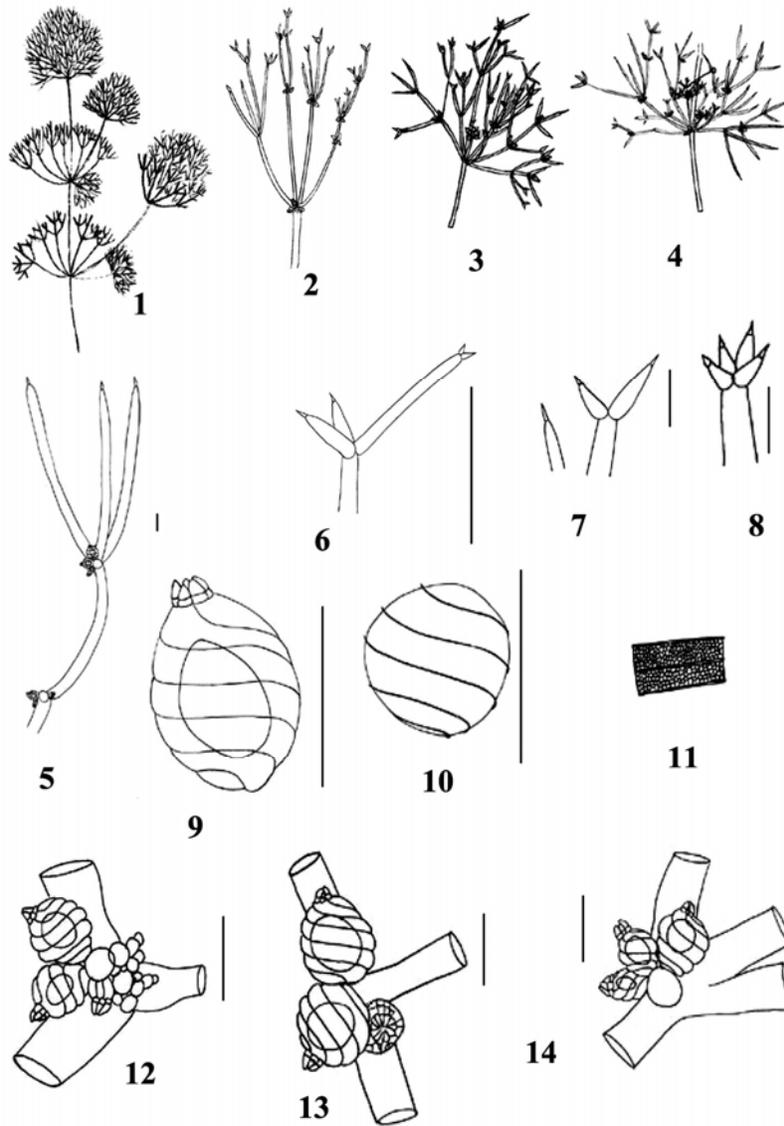
Diagnosis: *Nitella zamanii* is closely related to *N. furcata* and *N. polycarpa* but differs from them by presence of accessory branchlets, spiky dactyls, size and position of gametangia, size of oogonium and oospore, and rare occurrence of antheridium.

Type: Bangladesh, Rajshahi district, Charchat, Chamta beel, rice field, growing on soft mud, 10 cm of water depth, 4 January 2004, Nasrin Jahan Diba N16 (*Holotype*: PLLBDRB).

Plant monoecious, height 5-6 cm, spiky in appearance, mucus absent, slightly encrusted; lower whorls slightly spreading, stem 250 µm in diameter; internodes 1-2 cm, branchlets 5-8, 172 µm in diameter, height 1-2 cm; furcation irregular; branchlet two types: short accessory branchlet and long branchlets; accessory branchlet few, sometimes curved, primaries 3, of which one is not furcate, two rays again forked into 1 or 2, secondaries two, unequal; dactyls 2-celled, acute; a long unbranched branchlet arise from the base of a whorl and primaries 2-celled, dactyls 2 or 3, unequal, short, acute; long branchlet 1-3 times furcate, primaries 1/3 of the total branchlet, 4-6 in number, forked into 3, 4, 6 secondaries, few are again forked into 3 or 4 tertiaries; dactyls 1-4, different types, abbreviated, spine like, spreading, tapering, 1 or 2 celled, penultimate cell tapering distally to base of end cell, sometimes acuminate, ultimate cell acute; gametangia conjoined;

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Figs 1-14. *Nitella zamanii* Naz, Diba & Schubert, **sp. nov.** 1. Habit; 2. Upper portion of a plant; 3-4. A whorl; 5. Upper portion of a branchlet; 6-8. Dactyls; 9. Oogonium; 10. Oospore; 11. Oospore membrane; 12-14. Branchlet node with aggregated gametangia. (Scales: 1-4 & 11 = freehand drawing; rest = 0.2 mm)

oogonium usually aggregated in all branchlet nodes and at the base of whorl; lateral, short whorl arise from all stem nodes, oogonium 63-287 μm long, 35-208 μm wide, convolutions 6-9; corona two tiers, 39-40 μm long, 40-63 μm wide at the base, upper cell elongated, acute, sometimes unequal; oospore globose, 29-198 μm long, 22-165 μm wide, with 5 prominent ridges; membrane reticulate, antheridia rare, 185 μm in diameter.

Habitat: *Nitella zamanii* was collected from a shallow water habitat. This low land was cultivated with different crops, e.g. rice, wheat and sugarcane, in different seasons. After rainy season, charophytes densely grow in this location. Water depth ranged 5-15 cm. *Nitella zamanii* was found associated with *Nitella furcata* subsp. *furcata* f. *sieberi* (A. Br.) R.D.W.

Distribution: Only known from Chamta beel, Charghat Upazila, Rajshahi, Bangladesh

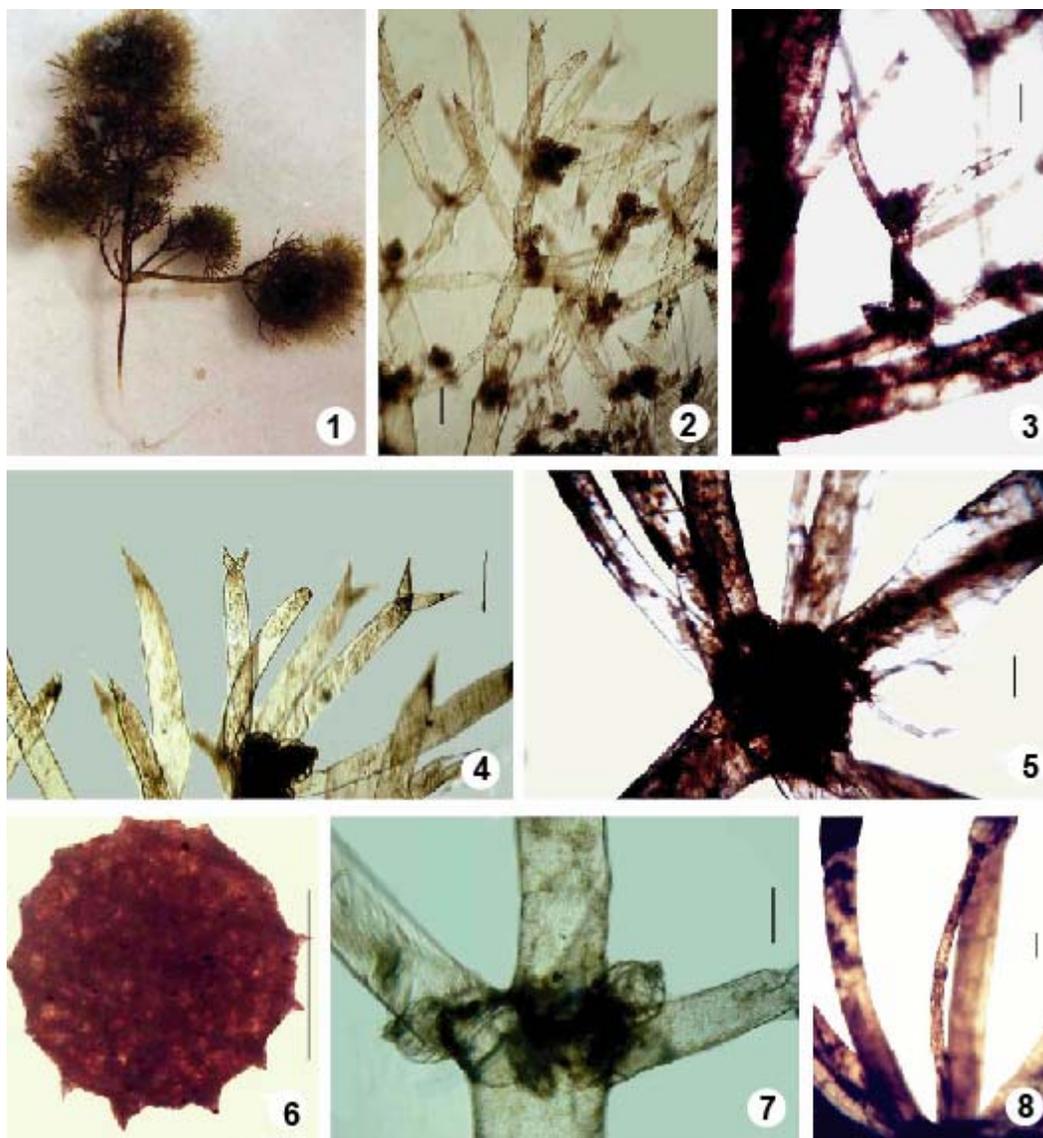


Plate 1. *Nitella zamanii* Naz, Diba & Schubert **sp. nov.** 1. Habit; 2. Fertile branchlet; 3. Tiny, short accessory branchlet; 4. Dactyls; 5. Short curved accessory branchlet; 6. Oospore; 7. Stem node and oogonium; 8. A long and unbranched branchlet. (Scales = 0.2 mm).

Etymology: *Nitella zamanii* has been named in honour of Professor M. Zaman, Department of Botany, University of Rajshahi, Bangladesh for his lifelong contribution to Phycology.

Notes: The new species *Nitella zamanii* has unique characteristics (Table 1). The whole plant is spike like. Accessory branchlets arise from the base of whorl and 1st furcation at a branchlet; accessory branchlets are of different types, elongated, short and sometimes curved. Dactyls are spine like. Fertile specimens of *N. zamanii* can easily be distinguished from *Nitella furcata*. The gametangia of *Nitella furcata* are restricted to the branchlet nodes (Zaneveld, 1940; Wood and Imahori, 1965), whereas oogonia of *Nitella zamanii* are aggregated at the base of whorl and each branchlet nodes. *Nitella zamanii* is similar to *Nitella polycarpa* which has oogonia at the base of whorls. But it differs from *Nitella polycarpa* (Pal *et al.*, 1962; Naz *et al.*, 2009) by the presence of accessory branchlets and the whorls of *N. polycarpa* are diffuse but the whorls of *N. zamanii* are compact. It is morphologically closely related to another *Nitella*, i.e. *Nitella furcata* subsp. *megacarpa* f. *megacarpa* (Wood and Imahori, 1965). But it differs by the position of gametangia and oospore membrane, the gametangia of *Nitella furcata* subsp. *megacarpa* f. *megacarpa* are restricted to the branchlet nodes and oospore membrane is finely to coarsely papillate, appearing incompletely reticulate at lower focus (Wood and Imahori, 1965). Oospore membrane of *Nitella zamanii* is finely reticulate.

Table 1. Comparison of morphological features of *Nitella zamanii* with closely related taxa of *Nitella*.

Morphological features	<i>Nitella zamanii</i>	<i>N. furcata</i> (Zaneveld, 1940)	<i>N. polycarpa</i> (Pal <i>et al.</i> , 1962)	<i>N. furcata</i> subsp. <i>megacarpa</i> f. <i>megacarpa</i> (Wood and Imahori, 1965)
Accessory branchlets	Present	Absent	Absent	Absent
Oogonium	63-287 µm long, 35-208 µm wide	240-450 µm long, 220-320 µm wide	480 µm long, 370 µm wide	300-700 µm long, 260-510 µm wide
Antheridium	185 µm	240-350 µm	275 µm	220-300 (-445) µm
Oospore	29-198 µm long, 22-165 µm wide	190-300 µm long, 180-270 µm wide	260 µm long, 250 µm wide	280-420 µm long, 245-380 µm wide

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