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Cover: Pseudo-flying animals and wind-dependent seed & spore dispersers – made with digital painting in Krita. © Melito Prinson Pinto

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NOTE

On the occurrence of two species of rare cyanobacterial genus *Petalonema* M.J.Berkeley ex Wolle, 1887 (Cyanophyceae: Nostocales: Scytonemataceae) from eastern Himalaya, India

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Petalonema M.J.Berkeley ex Wolle is a rare genus of Scytonemaceae known for its unique features. It is a filamentous genus growing mostly in subaerophytic situations forming mats. The genus could be easily identified due to its lamellated funnel shaped sheath divergent at ends, although not clear in all species (Geitler 1932; Desikachary 1959; Komárek 2013). The sheath is mostly coloured and very distinct. The trichome is uniseriate having barrel shaped cells sometimes constricted at junction points. Heterocysts are solitary and oval to spherical in shape and located variously, mostly at the base of the branches. Akinetes have not been recorded but reproduction by hormogonia formation and distintegration is well known (Komárek 2013; Guiry & Guiry 2022).

The systematic position of the genus was in matter of debate for sometime (Komárek & Anagnostidis 1989; Taton et al. 2006; Kukk et al. 2001; Uher 2010; Komárek 2013; Mares et al. 2015; Maree et al. 2018) but it is now almost settled. Komárek & Anagnostidis (1989) placed it under Microchaetaceae due to its heteropolar growth but Kukk et al. (2001) on the basis their observations on bipolar growth of hormogonia confirmed its closeness to *Scytonema*, that was further confirmed on the basis of molecular studies (Mares et al. 2015). Now its placement in Scytonemataceae is established.

During the systematic investigation on the algal diversity of eastern Himalaya and its foothills, the authors recorded two unique species of *Petalonema*: *Petalonema alatum* (Borzì ex Bornet & Flahault) Wolle & *Petalonema velutinum* Migula.

The samples were collected from the habitat by scrapping the mats with help of scalpel, preserved in 4% formalin solution and stored in amber colour bottles. Geographical location were recorded at the time of collection by a GPS device (GPS MAP 78S, GARMIN). Standard procedure was followed for permanent slide preparation. The samples were studied under Olympus GB compound microscope and images of the samples were taken using Zeiss Axioscope A1 microscope with Axiocam 504 model digital camera. The specimens are deposited in the Algae Herbarium of Department of Botany, the University of Burdwan (BURD).

Petalonema alatum (Borzì ex Bornet & Flahault) Wolle

Komárek, Süβwasserflora von Mitteleuropa. Cyanoprokaryota: 3rd part: Heterocystous genera. 19: p.

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Image 1. *Petalonema alatum*: 1–2—showing the habitat | 3—showing the filament | 4–6—showing the heterocysts (arrows indicate the heterocyst). © Jai Prakash Keshri.

146, f. 139. 2013]. (Image 1)

Thallus forming thick calcareous mats (up to 1 cm thick) under dripping wet rocks; filaments slightly erected, sheath distinctly lamellated with divergent lamellations ending in funnels, colourless, yellowish-brown, golden yellow, distinctly brown to dark tan coloured adjoin the main trichome where a clear layer of dark brown sheath is noticed; trichome cylindrical constricted at cross walls 12.60–16.34 µm broad; heterocysts always intercalary globose to barrel shaped always singh 13.59–16.66 µm broad and 7.13–13.15 µm long.

Ecological notes: Rajabhat khawa, Alipurduar, India;

26.5829^{0}N, 89.4604^{0}E; growing on wet rocks; collection no. MoEF/JPK/243; 25 September 2019.

Distribution in India: Tamil Nadu. This is the first report of the species from eastern Himalaya.

Petalonema velutinum Migula

Komárek, Süβwasserflora von Mitteleuropa. Cyanoprokaryota: 3rd part: Heterocystous genera. 19: p. 148, f. 142. 2013. (Image 2)

Thallus mat forming growing on wet rocks among *Trentepohlia* mats, deep brown in colouration; filaments coalescing, branches mostly in pairs; sheath gelatinous yellowish to reddish-brown in colouration, distinctly lamellated, lamellation divergent but not always distinctly demarcated as in *P. alatum*; trichome 5.57–10.37 µm in diameter, distinctly constricted at cross walls; cells 5.57–10.37 µm wide, and 5.95–8.14 µm long, spherical to slightly elongate, ovate in shape; heterocysts intercalary always, solitary, 10.37 µm wide and 4.84 µm long more or less rectangular and broader than long.

Ecological notes: On the rocks near Relli River, Kalimpong, West Bengal, India; 27.0864^{0}N, 88.8211^{0}E; collection no. MoEF/JPK/224; 23 September 2019.

Distribution in India: First report from India (Eastern Himalaya, West Bengal).

So far *Petalonema alatum* Berkeley ex Kirchner 1898 has been reported from Tamil Nadu (Desikachary 1959). *Petalonema densum* A. Braun ex Migula was recorded from Karnataka (Desikachary 1959), Madhya Pradesh, and Maharashtra (Gupta 2012). R.K. Gupta (2001) has described a new species *P. striato-theca* from Tiuni, Dehradun (Uttrakhand). So far no species of this genus has been reported from eastern Himalaya. Occurrence of these two species from eastern Himalaya is therefore new record for both the species including new record for *Petalonema velutinum* Migula from the Indian subcontinent.

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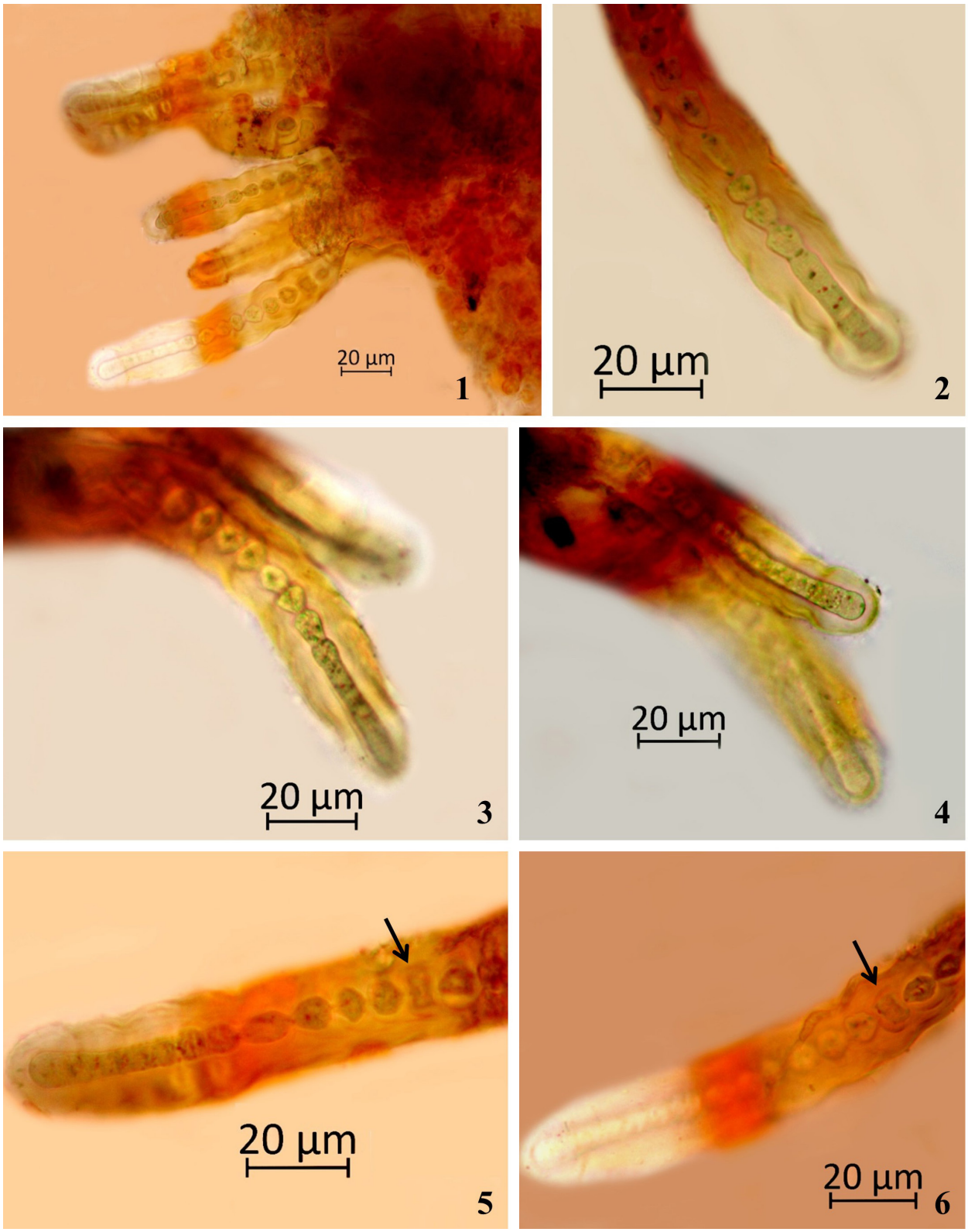

Image 2. ***Petalonema velutinu:*** **1—showing the cluster of filaments | 2–4—showing the filaments | 5–6—showing the heterocysts (arrows indicate the heterocyst). © Jai Prakash Keshri.**

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