



## ***Diploneis fenestrata* sp. nov. (Bacillariophyta), a new aerophilic diatom species from Zambia, Africa**

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### **Abstract**

*Diploneis fenestrata*, a new aerophilic diatom is described from Lumangwe falls, Zambia. This novel species occurs as an epiphyte on the roots and stems of trees located within the spray zone of the falls. Its morphology was examined with both light and scanning electron microscopy. *Diploneis fenestrata* is distinguished from other taxa in the genus *Diploneis* by its prominent square openings ranging in number from 4–14 occurring within the area of the longitudinal canal only at the outer cell wall. The occurrence of these characteristic square openings found in the genus *Diploneis* is further discussed.

**Key words:** Diatoms, *Diploneis fenestrata*, cell wall structure, Lumangwe falls

### **Introduction**

African benthic diatoms from lotic ecosystems and especially central and southern African diatoms have received relatively little scientific attention given the scale of these territories. Recently, however, samples were collected from two of the largest and most under-studied catchment basins in Africa: the Zambezi and the Congo basins. The Zambezi catchment basin has received very little attention in terms of the study of rivers and streams, with only three studies in the last 60 years (Cholnoky 1954, Cholnoky 1970, Compère & Delmotte 1988, the latter authors also highlighted the scarcity of diatom records from Zambia). A countrywide survey of the diatoms of Zambia was recently undertaken and included both the Zambezi and Congo River drainage basins. The main focus of the EU ACP funded Southern Africa River Assessment Scheme (SAFRASS) project ([www.safrass.com/](http://www.safrass.com/)), together with the BELSPO funded Congo Zambezi Diatom Monitoring (COZADIMO) project, is sampling rivers and streams with the aim of developing a diatom-based monitoring protocol for the inference of water quality (Cocquyt *et al.* 2014). However, samples were also collected from other moist or periodically wet habitats such as waterfalls, their associated spray zones and stream edges. It was in one such sample, collected from the spray zone of a waterfall located in northern Zambia, that an unidentified species of *Diploneis* (Ehrenberg) Cleve (1894: 76; basionym: *Pinnularia didyma* Ehrenberg 1845: 144) was discovered, its chief distinguishing character was the square openings in the outer cell wall in the longitudinal canal adjacent to the raphe. Only a few taxa from *Diploneis* have been recorded from the (sub-) tropics and, furthermore, most have probably been identified using concepts based on European taxa such as *D. elliptica* (Kützing) Cleve (1894: 92; basionym: *Navicula elliptica* Kützing 1844: 98), *D. oblongella* (Nägeli ex Kützing) Cleve-Euler in Cleve-Euler & Osvald 1922: 57; basionym: *Navicula oblongella* Nägeli ex Kützing 1849: 890), *D. ovalis* (Hilse) Cleve (1891: 44; basionym: *Pinnularia ovalis* Hilse 1860: 82) (Gasse 1986, Cocquyt 1998; for a recent example of misidentified species of *Diploneis* from Lake Ohrid see Jovanovska *et al.* 2013).

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