
Nomenclatural and taxonomic notes on Brazilian desmids III: *Cosmarium*, *Euastrum* and *Staurastrum* (Desmidiaceae, Zygnematophyceae)

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The present paper is the third of a series dealing with nomenclatural updates for Brazilian desmids. The previous two publications updated the following genera: *Bambusina*, *Groenbladia*, *Hyalotheca*, *Sphaerosoma* (Ramos & Moura 2019a), and *Closterium*, *Haplotaenium*, *Planotaenium*, *Xanthidium* (Ramos & Moura 2019b). Here we propose to update the names of taxa ascribed to the genera *Cosmarium*, *Euastrum*, and *Staurastrum*.

According to Compère (1976) the name *Cosmarium circulare* Reinsch, *nom. illeg.* (Reinsch 1867: 113) should be replaced by *Cosmarium candianum* Delponte (Delponte 1877: 113), because of the earlier homonym, *Cosmarium circulare* (Hassall ex Ralfs) Kützing (Kützing 1849: 174), based on a different type and founded on *Euastrum circulare* Hassall ex Ralfs (Ralfs 1848: 85). We therefore update the following infraspecific taxon:

Cosmarium candianum* var. *minutissimum (Kurt Förster & Eckert) G.J.P.Ramos & C.W.N.Moura, *comb. nov.*

Basionym: *Cosmarium circulare* var. *minutissimum* Kurt Förster & Eckert in Förster, *Revue Algologique N.S.* 7: 68, pl. 5: fig. 10, 1963.

Cosmarium depressum (Nägeli) P.Lundell, *nom. illeg.* (Lundell 1871: 38) is a later homonym (ICN Art. 53.1, Turland et al. 2018) of *C. depressum* Kützing (Kützing 1849: 176), *non C. depressum* Bailey (Bailey 1851: 36), currently known as *Cosmarium baileyi* Wolle 1884: 64), therefore requiring a new name.

Cosmarium neodepressum G.J.P.Ramos & C.W.N.Moura, *nom. nov.*

Replaced synonym: *Euastrum depressum* Nägeli, *Neue Denkschriften der Allg. Schweizerischen Gesellschaft für die Gesamten Naturwissenschaften* 10(7): 114, pl. 7: fig. 2, 1849.

Synonym: *Cosmarium depressum* (Nägeli) P.Lundell 1871: 38, *nom. illeg.*, *Nova Acta Regiae Societatis Scientiarum Upsaliensis, ser. 3*, 8(2): 38, 1871.

The following infraspecific taxa occurring in Brazil (Borge 1918, Grönblad 1945, Förster 1969, 1974, Huszar *et al.* 1987, 1988, Oliveira *et al.* 2010, 2016) are updated here, as follows:

Cosmarium neodepressum* var. *achondrum (Boldt) G.J.P.Ramos & C.W.N.Moura, *comb. nov.*

Basionym: *Cosmarium phaseolus* var. *achondrum* Boldt, *Öfversigt af Kongliga Vetenskaps-Akademiens Förhandlingar* 42(2): 103, pl. V [5], fig.7, 1885.

Synonym: *Cosmarium depressum* var. *achondrum* (Boldt) West & G.S.West, *A monograph of the British Desmidiaceae. II.* 177, pl. LXII [62]: figs. 6-9, 1905.

Cosmarium neodepressum* var. *elevatum (Borge) G.J.P.Ramos & C.W.N.Moura, *comb. nov.*

Basionym: *Cosmarium depressum* var. *elevatum* Borge, *Arkiv för Botanik* 15(13): 34, pl. 3, fig. 6, 1918.

Cosmarium neodepressum* var. *minutum (Heimerl) G.J.P.Ramos & C.W.N.Moura, *comb. nov. et stat. nov.*

Basionym: *Cosmarium depressum* f. *minutum* Heimerl, *Verhandlungen der zoologisch-botanischen Gesellschaft in Wien* 41: 598, pl. 5: fig 10, 1891.

Cosmarium neodepressum* var. *planctonicum (Reverdin) G.J.P.Ramos & C.W.N.Moura, *comb. nov.*

Basionym: *Cosmarium depressum* var. *planctonicum* Reverdin, *Archives des Sciences Physiques et Naturelles, Série 5* 1: 450, figs. 94-104, 1919.

Cosmarium neodepressum* var. *reniforme (West & G.S.West) G.J.P.Ramos & C.W.N.Moura *comb. nov.*

Basionym: *Cosmarium depressum* var. *reniforme* West & G.S.West, *Monogr. A monograph of the British Desmidiaceae. II*: 178, pl. LXII [62]: fig. 10, 1905.

Cosmarium sublobatum (Ralfs) W.Archer (in Pritchard 1861: 731) is a homotypic synonym of *Euastrum sublobatum* Brébisson ex Ralfs (Ralfs 1848: 91). Here we update the following infraspecific taxon:

Euastrum sublobatum* var. *brasiliense (Borge) G.J.P.Ramos & C.W.N.Moura *comb. nov.*

Basionym: *Cosmarium sublobatum* var. *brasiliense* Borge, *Arkiv für Botanik* 1:101, pl. 3: fig. 34. 1903.

The name “*Staurastrum stelliferum* var. *corpulentum*” proposed by Förster (1969:95, pl. 42: figs. 8-10; pl. 43: figs. 1, 2) as a new combination based on the designation “*Staurastrum leptopus* f. *corpulentum*” introduced by Thomasson (1960: 30, pl. 9: fig. 32, pl. 11: fig. 1) is invalid because Thomasson did not provide a Latin diagnosis or description nor did he indicate a holotype (ICN Art. 40.1, Turland *et al.* 2018). We here validate the taxon as a new variety providing the diagnosis and type designation based on specimens studied by Kuno Thomasson and Kurt Förster.

Staurastrum stelliferum* var. *thomassonii G.J.P.Ramos & C.W.N.Moura, *var. nov.*

Description: Cells longer than broad, slightly constricted; sinus slightly open; semicells cup-shaped, the apical angles with long, stout, diverging processes with 3-4 stout terminal spines; semicell body at the base of each process as well as on corresponding places at the base of the semicell ornamented with small groups of acute granules or spines; semicells in apical view 3-4-radiate with about straight sides, the angles produced to form long processes. Cell length without processes 28-35 µm, with processes 61-85 µm. Cell breadth without processes 15-23 µm, with processes 60-85 µm. Breadth of isthmus 11-14 µm.

Holotype: Thomasson 1960, pl. 9: fig. 32, pl. 11: fig. 1 (as “*Staurastrum leptopus* f. *corpulentum*”; iconotype; ICN Art. 40.5, Turland *et al.* 2018).

Type locality: Lake Bangweulu, Zambia, Africa.

Etymology: Named to honour the desmidologist Kuno Thomasson (1923-2007).

Occurrence: In Brazil, this taxon occurs in the Amazon region (as “*Staurastrum leptopus* f. *corpulentum* Thomasson” *nom. inval.* in Scott *et al.* 1965; as “*Staurastrum stelliferum* var. *corpulentum* (Thomasson) Kurt Förster,” *nom. inval.* in Förster 1969).

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