



Reinstatement of the genus *Willea* Schmidle 1900 for *Crucigeniella* Lemmermann 1900 *nom. illeg.* (Chlorellales, Trebouxiophyceae, Chlorophyta)

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The genus *Willea* Schmidle (1900a: 157) was created based on *Crucigenia irregularis* Wille (1898: 317), a species described as having no pyrenoid but later discovered to be present, although often indistinct (Komárek 1974). The same year Lemmermann (1900b) described the new genus *Crucigeniella* Lemmermann (1900b: 307, 308), based on differences in cell arrangement and morphology and presence or absence of cellular spaces, with *Crucigeniella lunaris* Lemmermann (1900b: 308) as the type species. Later, Lemmermann (1904, p. 22) transferred *Willea irregularis* (Wille) Schmidle (1900a: 157) to the genus *Cohniella* Schröder (1897: 373) despite having placed it earlier (Lemmermann, 1900a, p. 95) in *Tetrastrum* Chodat (1895: 114), a genus, in which the cells usually have distinctive marginal spines. His decision to recognize *Cohniella irregularis* (Wille) Lemmermann (1904: 22) and create two sections/subgenera distinguished by the presence or absence of margins spines has not been accepted. *Cohniella irregularis* was placed in the synonymy of *Willea irregularis* by Komárek (1974, p. 41), who discounted pyrenoids as a generic character (p. 11) and emphasized the taxonomic importance of the arrangement and orientation of daughter cells within the mother coenobium. He separated *Willea* from *Crucigeniella* on the basis that the long axes of the daughter cells of the latter were not always aligned to that of the mother coenobium and occasionally were at an angle of 90° to it. In addition to the type of *Willea* (*W. irregularis*), a second species was recognized when Komárek (1974, p. 42) transferred *Dispora wilhelmii* Fott (1933: 168) to the genus *Willea*.

The generic name *Crucigeniella* is illegitimate because it is a later homonym of a name validated earlier by Gaillon (1833, p. 34, Table C). The type species of Gaillon's *Crucigeniella* was *Crucigenia quadrata* Morren (1830: 426), but remains the type of the genus *Crucigenia* Morren (1830: 426, pl. XV, figs 1-5). Schmidle (1901) proposed *Staurogeniella* Schmidle (1901: 16) as a substitute name for *Crucigeniella*, stating (note, p. 16) "Eine genaue Anwendung der Nomenklaturregeln macht auch die Gattung *Crucigeniella* (Lemmerm.) unmöglich, welche in *Staurogeniella* (Lemmerm.) umzuwandeln ist, mit der Art *Staurog. lunaris* (Lemmerm.)" and does not mention Gaillon's earlier use of the name *Crucigeniella*. Wille (1911, p. 66) transferred the type of Lemmermann's *Crucigeniella* to *Crucigenia*, but later Komárek (1974) reinstated *Crucigeniella lunaris*. John & Tsarenko (2002, p. 344) believed the occasional 90° alignment of daughter cells to the long axis of the mother coenobium to be insufficient justification for separating *Willea* from *Crucigeniella*. Consequently they transferred the two extant species of *Willea* to *Crucigeniella*, namely, *C. irregularis* (Wille) P. Tsarenko & D.M. John in John & Tsarenko (2002: 345) and *C. wilhelmii* (Fott) D.M. John & P. Tsarenko in Tsarenko & John (2011: 479).

Because *Crucigeniella* is illegitimate, *Willea* is available as a substitute name hence the following transfers.

Willea africana (J. Wołoszyńska) D.M. John, M.J. Wynne & P. Tsarenko, *comb. nov.*

Basionym: *Crucigenia apiculata* var. *africana* J. Wołoszyńska 1914. *Hedwigia* 55: 200, VII; fig. 13.

Nomenclatural synonym: *Crucigeniella africana* (J. Wołoszyńska) Fott (1981: 1).

Willea apiculata (Lemmermann) D.M. John, M.J. Wynne & P. Tsarenko, *comb. nov.*

Basionym: *Staurogenia apiculata* Lemmermann 1898. *Botanisches Centralblatt* 76(4): 151, pl. 1: 14.

Nomenclatural synonyms: *Crucigeniella apiculata* (Lemmermann) Komárek (1974: 38); *Crucigenia apiculata* (Lemmermann) Schmidle (1900b: 234).

Taxonomic synonyms: *Crucigeniella pulchra* (W. West & G.S. West) Komárek (1974: 39); *Crucigenia pulchra* W. West & G.S. West (1902: 63).

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