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On changes in the nomenclature of some taxa of *Zygnemaceae*

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Abstract

The names of three species have been changed in the *Zygnemaceae* family because of their incompatibility with the principles of classification of the International Code of Botanical Nomenclature. The names and ranks of 18 taxa were also changed since they did not comply with the classification accepted for this family. The names of the taxa listed in this paper are introduced in the 16th volume of *Conjugatophyceae* I. *Zygnemales*, in the collective work "Die Süsswasserflora von Mitteleuropa" (Kadłubowska 1984).

Key words: nomenclature, Zygnemales nom. nov., stat. nov., comb. nov.

In the course of taxonomical investigations concerning the family *Zygnemaceae* it appeared that some taxa are incorrectly named, not in keeping with the principles of the International Code of Botanical Nomenclature or the principles of classification accepted for this family. In studies concerning the family *Zygnemaceae* the species was adopted as the lowest taxonomic unit (Czurda 1932, Kolkwitz and Krieger 1941, 1944, Transeau 1951, Randhawa 1959, Kadłubowska 1972). Departure from this rule would cause a change in diagnosis for hundreds of species. The following features are essential for identification of species:

a) diametre of vegetative cells,
b) character of the septa,
c) shape of sterile cells,
d) type of conjugation,
e) shape of female gametangium,
f) shape of zygospores, their pigmentation and sculpturing.

For the above named reasons the following changes have been introduced in the nomenclature of taxa of the *Zygnemaceae* family.

1. *Zygnema subcalosporum* Kadłubowska nom. nov. (= *Zygnema subtenue* Prasad et Godward 1966, Phykos 5 (1, 2) pp. 191-193, Figs. 2, 7; non *Zygnema subtenue* Gauthier-Lièvre 1965).
2. *Spirogyra bii* Kadłubowska nom. nov. (= *Spirogyra crassiuscula* Bi 1979, Oceanol. Limnol. Sinica 10, (4), p. 355. Pl. I, Fig. 3A, B, non *Spirogyra crassiuscula* (Wittr. et Nordst.) Transeau 1934).
3. *Spirogyra Gauthier-lièvreae* Kadłubowska nom. nov. (= *Spirogyra pseudoneglecta* Gauthier-Lièvre 1965, Beih. Nova Hedwigia, 20, p. 146, Pl. LI, Fig. A a, non *Spirogyra pseudoneglecta* Czurda 1932).

The names suggested by the authors of these three species do not agree with par. 64 of the International Code of Botanical Nomenclature since they are homonyms.

4. *Mougeotia nayarhatensis* (Islam) Kadłubowska stat. nov. (= *Mougeotia longiarticulata* f. *nayarhatense* Islam 1972, Nova Hedwigia 23, (4), pp. 657-658, Pl. VI, Fig. 49).

The cause of the change of rank of this taxon is the difference in the median spore wall which in *M. longiarticulata* is smooth, while in *M. longiarticulata* f. *nayarhatense* it is scrobiculate.

5. *Zygnema kazachstanicum* (Rund.) Kadłubowska stat. nov. (= *Zygnema insigne* (Hass.) Kütz. 1849 f. *kazachstnicum* Rund. 1977, Novosti Sistem. Nizshikh Rast. 14, p. 42, Fig. 1).

The diagnostic features of *Zygnema insigne* and *Z. insigne* f. *kazachstanicum* show significant differences. In the species conjugation is scalariform and lateral, the zygospores are ellipsoid or spherical, the vegetative cell diametre is 26-32 μm, whereas in the form conjugation is only scalariform, the zygospores are spherical and the vegetative cell diametre is 35-37 μm.

6. *Zygnema scrobiculatum* (Gauthier-Lièvre) Kadłubowska stat. nov. (= *Zygnema saharae* Gauthier-Lièvre var. *scrobiculata* Gauthier-Lièvre 1941, Bull. Soc. Hist. Nat. Afr. du Nord 32, p. 106, Fig. 7E).

The cause of the change in taxonomic rank is the difference in the median spore wall structure which in *Z. saharae* is smooth and in the variety *Z. saharae* var. *scrobiculata* scrobiculate.

7. *Zygogonium cyanosphaeroidicum* (O. Bock et W. Bock) Kadłubowska comb. nov. (= *Zygnema cyanosphaeroidica* O. Bock et W. Bock 1956, Arch. Hydrobiol. 52, (3), p. 441, Fig. 2c, d, e).

Zygnema cyanosphaeroidica exhibits a feature characteristic for the genus *Zygogonium*, namely, zygospore formation in the sporangium which is separated by a septum from the gametangia, whereas

in the genus *Zygnema* the zygospores arise in the conjugation canal or in the female gametangium.

8. *Zygogonium reniforme* (Hu) Kadłubowska stat. nov. (= *Zygogonium orientale* Wei 1979 var. *reniforme* Hu 1979, Oceanol. Limnol. Sinica 10, (2), p. 177 Pl. I, Figs. 5-7).

The cause of the change of the taxonomic rank is in the first place the difference in the conjugation type which in *Z. orientale* is scalariform, and in *Z. orientale* var. *reniforme* lateral. These taxons also differ by the shape of their zygospores which in *Z. orientale* are lenticular, and in *Z. orientale* var. *reniforme* kidney-shaped.

9. *Zygogonium stictosporum* (Skuja) Kadłubowska stat. nov. (= *Zygogonium africanum* Bourrelly 1961 var. *stictosporum* Skuja 1976, Nova Acta Reg. Soc. Sci. Upsal. 5, (2), pp. 35, 36, Pl. IV, Figs. 1-5).

The taxonomic rank has been changed on account of the differences in the sculpturing of the median spore wall which in *Z. africanum* is lamellate and in *Z. africanum* var. *stictosporum* scrobiculate.

10. *Spirogyra henanensis* (Bi) Kadłubowska stat. nov. (= *Spirogyra shanxiensis* Zheng et Ling 1979 var. *henanensis* Bi 1979, Oceanol. Limnol. Sinica 10, (4), p. 359, Pl. 3, Fig. 2).

The taxonomic rank is changed above all because of the differences in the shape of the female gametangium during conjugation. This organ in *S. shanxiensis* is inflated on the side facing the conjugation canal, exclusively, and in *S. shanxiensis* var. *henanensis* it is inflated on all sides.

11. *Spirogyra lucknowense* (Prasad et Dutta) Kadłubowska stat. nov. (= *Spirogyra chakiaense* (Rao) Krieger 1944 var. *lucknowense* Prasad and Dutta 1970, Hydrobiologia 36 (1), pp. 29, 30, Figs. 4, 5).

The diagnostic features in *S. chakiaense* and *S. chakiaense* var. *lucknowense* are different. In the species the chromatophore number ranges from 4 to 8, the vegetative cell diametre varies from 90 to 105 μm, and zygospore dimensions are: 50-70 $\times$ 73-122 μm. In the variety there are four chromatophores, the vegetative cell diametre varies from 88 to 90 μm and the zygospore dimensions are 68-88 $\times$ $\times$ 88-118 μm.

12. *Zygnema hui* Kadłubowska nom. nov. et. stat. nov. (= *Zygnema khannae* Skuja f. *minor* Jao et Hu 1978, Oceanol. Limnol. Sinica 9, (2), pp. 197-198, Pl. II, Figs. 3, 4).

The taxonomic rank is changed because of the differences in the sculpturing of the outer spore wall which in *Z. khannae* is punctate, and in *Z. khannae* f. *minor* corrugated.

13. *Spirogyra borgei* Kadłubowska nom. nov. et stat. nov. (= *Spirogyra borgeana* Trans. 1915 var. *intermedia* Zheng et Ling 1979, Oceanol. Limnol. Sinica 10, (3), pp. 288, 289, Pl. II, Fig. 1).

S. borgeana differs from *S. borgeana* var. *intermedia* by its uninflated sterile cells. In the variety the diametre of these cells increases by almost 100 per cent.

14. *Spirogyra iyengarii* Kadłubowska nom. nov. et stat. nov. (= *Spirogyra jogensis* Iyengar 1958 var. *minor* Iyengar 1958, J. Indian Bot. Soc. 37, (3), p. 391, Figs. 13-21).

The diagnostic features of *S. jogensis* and var. *minor* differ widely. In the species there are six chromatophores, the vegetative cell diametre ranges from 70 to 80 μm and the zygospore dimensions are 70-76 $\times$ 90-122 μm, whereas in the variety there are three chromatophores, the vegetative cell diametre varies from 38 to 48 μm and the zygospore dimensions are 42-52 $\times$ 68-88 μm.

15. *Spirogyra kamatii* Kadłubowska nom. nov. et stat. nov. (= *Spirogyra azygospora* Singh 1938 var. *inflata* Kamat 1962, Hydrobiologia 20, (3), p. 267, Fig. 11).

S. azygospora differs from *S. azygospora* var. *inflata* above all by the number of chromatophores and the diametre of vegetative cells. In the species there are 5 chromatophores and the vegetative cell diametre ranges from 75 to 90 μm, whereas in the variety there are three to five chromatophores and the cell diametre is 60-77 μm. Moreover, cells with aplanospores are inflated in this variety.

16. *Spirogyra multiformis* Kadłubowska nom. nov. et stat. nov. (= *Spirogyra siamensis* Transeau 1951, var. *polymorphis* Rattan 1971, Phykos 10, (1-2), p. 139, Figs. 4-8).

The change in the taxonomic rank is introduced on account of the difference in zygospore shape which in *S. siamensis* is ellipsoid and in *S. siamensis* var. *polymorphis* spherical, ovoid or ellipsoid.

17. *Spirogyra poljanskii* Kadłubowska nom. nov. et stat. nov. (= *Spirogyra bullata* Jao 1935 f. *maior* Poljanskij 1959, Bot. Mat. Otd. Spor. Rast. 12, p. 141, Fig. 5).

The taxonomic rank is changed because of the differences in the vegetative cell diametre. In *S. bullata* it amounts from 19 to 22 μm and in *S. bullata* f. *maior* from 26 to 27 μm.

17. *Spirogyra poljanskii* Kadłubowska nom. nov. et stat. nov. (= *Spirobuchetii* Petit 1913 var. *bullata* Rattan 1971, Phykos 10, (1, 2), p. 137, Figs. 1-3).

The diagnostic features of *S. buchetti* and *S. buchetii* var. *bullata* are different. In the species there are two, three or four chromatophores in the cells. The female gametangia and sterile cells are cylindrical, whereas in the variety there are two chromatophores in the cell and the female gametangia and sterile cells are inflated.

19. *Spirogyra subbullata* Kadłubowska nom. nov. et stat. nov. (= *Spirogyra juergensii* Kützing 1845 f. *inflata* Bi 1979, Oceanol. Limnol. Sinica 10, (4), p. 359, Pl. II, Fig. 4).

The taxonomic rank is changed because of the shape of the sterile cells which in *S. jürgensii* behave cylindrical shape whereas in *S. jürgensii* f. *inflata* are inflated.

20. *Spirogyra subsalso-punctulata* Kadłubowska nom. nov. et stat. nov. (= *Spirogyra subsalsa* Kütz. 1845 f. *punctulata* Krasnoperova 1966, Novosti Sistem. Nizshikh Rast. p. 95, Fig. 1).

The rank of the taxon is changed on account of differences in the structure of the median spore wall which in *S. subsalsa* is smooth and in the form *S. subsalsa* f. *punctulata* is punctuated.

21. *Sirogonium kamatii* Kadłubowska nom. nov. et stat. nov. (=*Sirogonium hui* (Li) Transeau 1944 f. minor Kamat 1962, Hydrobiologia 20, (3), p. 270, Fig. 14).

The diagnostic features of both these taxons differ widely. In *S. hui* there are nine chromatophores in the cell, the outer layer of the median spore wall is wrinkled and the inner verrucose, the vegetative cell diametre varies from 82 to 108 μm. In *S. hui* f. *minor* there are four chromatophores in the cell, the outer layer of the median spore wall is punctuate and the inner one wrinkled, the vegetative cell diametre ranges from 65 to 70 μm.

The above listed changes in the nomenclature have been introduced into the 16th volume of the 24-volume work "Die Süsswasserflora von Mitteleuropa", comprising *Conjugatophyceae* I. *Zygnemales* (Kadłubowska 1984).

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Zmiany nomenklatoryczne niektórych taksonów rodziny Zygnemaceae

Streszczenie

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