Stuckenia Börner 1912 – the correct name for *Coleogeton* (*Potamogetonaceae*)

***Stuckenia* Börner 1912 – správné jméno pro rod *Coleogeton* (*Potamogetonaceae*)**

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Holub J. (1997): *Stuckenia* Börner 1912 – the correct name for *Coleogeton* (*Potamogetonaceae*). – Preslia, Praha, 69 (1996):361–366.

Stuckenia Börner 1912 is the correct generic name for a group of species allied to *Potamogeton pectinatus* L. (= subgen. *Coleogeton*), when the group is excluded from *Potamogeton* as a separate genus. A brief characteristic of the genus including its diagnostic characters is given. Börner's name *Stuckenia* replaces the generic name *Coleogeton* used independently by Dostál (an invalidly published generic name in the 1980s) and by Les et Haynes (a validly published generic name in 1996). After Börner, *Stuckenia* was accepted by Holub in 1984. Until now, *Stuckenia* was used for three species; nine further combinations are proposed in this paper, six for species, three for nothospecies. A list of names of taxonomically unclear, uncertain and insufficiently known taxa, with notes, is added.

Keywords: nomenclature, taxonomy, *Coleogeton*, *Potamogeton*, *Stuckenia*.

History

Potamogeton L. 1753 is a taxonomically relatively diversified group but, in spite of this fact, it has been accepted in various recent classifications either as a compact unit or with exclusion of only one species – *P. densus* L. – from it which is placed in the genus *Groenlandia* J. Gay. Infrageneric classifications of *Potamogeton* by various authors include different subgenera, sections, subsections and series, but in every such scheme an isolated and clear-cut group occurs containing species closely allied to *P. pectinatus* L., classified either as a section (sect. *Coleophylli* W. D. J. Koch) or as a subgenus (subgen. *Coleogeton* Reichenb., or subgen. *Coleogeton* (Reichenb.) Raunkiaer, respectively). The exclusion of this group as a separate genus was first proposed by Börner (1912a, b), but his attempt was neglected by those authors who later studied the taxonomy of *Potamogeton*. Börner (1912b), in his Flora of Germany ("Volksflora"), proposed nomenclatural combinations with *Stuckenia* for only two species of pondweeds from that group occurring in Germany, viz. *P. pectinatus* and *P. filiformis*. In the 1980s the subgenus *Coleogeton* was elevated to the generic level by Dostál (1982, 1984, 1989) – in all cases, however, invalidly. In 1982 Dostál gave the authorship of that generic name as "(Reichenb.) Dostál" and in 1984 he ascribed the generic name *Coleogeton* to Raunkiaer. The present author was unable to locate the publication place of the generic status of that name in Raunkiaer's works. Raunkiaer (1896 and later) always classified the taxon only as a subgenus. In all his three cited publications Dostál did not quote the publication place of the infrageneric taxon *Coleogeton* from Reichenbach (nor that of the combination used by Raunkiaer) and therefore his change of status is nomenclaturally invalid, as are also his newly proposed

combinations *Coleogeton pectinatus* (L.) Dostál 1984 and *C. pectinatus* subsp. *balatonicus* (Gams) Dostál 1984. The nomenclaturally valid publication of the generic name *Coleogeton* was realized only most recently by Les et Haynes (1996), most probably without knowledge of the above mentioned invalid Dostál's attempts to publish this generic name. These authors validly proposed the change of the taxonomic status of *Coleogeton* to the generic level and combinations for four species and two subspecies to be used in the Flora of North America. Previously, the present author (Holub 1984) had focused attention to the existence of an earlier generic name for the group published validly by Börner (1912a, b) and simultaneously proposed a third species combination with *Stuckenia* – *S. vaginata* (Turcz.) Holub 1984. Further combinations with *Stuckenia* were intended to be published by him elsewhere later, however, they have not been proposed till now. They were prepared and included in a paper for Folia Geobotanica et Phytotaxonomica (Holub Ms. 1996), but because of the change in the publication policy of that journal the paper could not be accepted there (see also Holub 1997). The new combinations with *Stuckenia* were therefore excluded from that manuscript and have been prepared for publication separately in this brief communication also therefore, that the acceptance of the genus seems to be supported by other taxonomists.

Characteristics of *Stuckenia*

A brief description of the characters and features of the genus *Stuckenia* is given here, although the data given by Les et Haynes (1996) might adequately provide reasons for the acceptance of this genus. Important facts on this problem are given in the following papers: Börner (1912a), Cvelev (1996), Les, Cleland et Philbrick (1995), Les et Haynes (1996), Preston (1995), and Sorsa (1988); an opposite opinion is defended by Terjochin et Čubarov (1996). *Stuckenia* differs from *Potamogeton* (and *Groenlandia*) by a series of morphological and anatomical characters. The main diagnostic characters of *Stuckenia* are as follows: long stipular sheaths, tubular leaves with air channels bordering the midrib, flexuous peduncles, hydrophilous pollination and a hexaploid chromosome number (2n = 78 = 6x). Stipules are adnate to the basal part of the leaf and form a sheath with a ligula above; they are adnate at least to 2/3 of their length. A somewhat similar sheath is known only rarely among the representatives of *Potamogeton* s. s.; especially two species are mentioned in this connection, viz. *P. robbinsii* Oakes and *P. serrulatus* Regel et Maack (= *P. maackianus* A. Benn.), where the fusion of stipules to the basal part of the leaf is usually at most 1/2 of their length. For submerged leaves of *Stuckenia* the grooves or canals are characteristic, they are opaque and somewhat turgid. In *Potamogeton* (and *Groenlandia*) they are without grooves or canals and usually translucent and flat. Sterile plants of *Stuckenia* taxa may be easily determined as representatives of the genus by that structure of the leaves. Peduncles (with regard to their anatomical structure they differ from that in *Potamogeton* species) are long, slender, flaccid and flexuose, after emerging from the water bent to the water level or below it. Hydrophily (connected only partly with anemophily) follows consequently from this position of the inflorescence; anemophily generally occurs in representatives of *Potamogeton* s. s. A difference was also noted in the pollen grains (Sorsa 1988); the difference between the pollen morphology of *Stuckenia* and that of *Potamogeton* is greater than the difference between that of *Potamogeton* and *Groenlandia*. For all representatives of *Stuckenia* studied karyologically till now, the

chromosome number has been found to be 2n = 78 (in *S. pectinata* a series of aneuploid numbers is also known), which in *Potamogeton* s.l. is characteristic only for this group. In *Potamogeton* s.s. the normally occurring chromosome numbers are 2n = 26 and 2n = 52. Some different trends in expression of certain morphological characters may be also mentioned here. The leaves of *Stuckenia* are always sessile: in *Potamogeton* petiolate leaves also occur in many species. The inflorescences in *Stuckenia* are often interrupted: in *Potamogeton* they are usually compact. A further supporting feature for the exclusion of *Stuckenia* from *Potamogeton* is the fact that in both groups many hybrids exist within the representatives of the respective groups, but none is known between the representatives of these two groups; a situation rather similar to that e.g. between *Epilobium* and *Chamerion* (Holub 1972). In addition, studies of micromolecular differences carried out by Les, Cleland et Philbrick (1995) show the exclusion of the *Coleogeton* group as a separate genus to be justified. Acceptance of *Stuckenia* as a separate genus is positively evaluated also by Cvelev (1996).

Stuckenia (*Coleogeton*) is a monophyletic group and occupies an isolated position in *Potamogeton* s.l. It is not clear whether it is close to an ancestral type or whether it belongs to evolutionary derived groups. Some features are rather close to a primitive state (e.g. pollen, Sorsa 1988), but others are evolutionary derived (adnate stipules, fruits without a keel, chromosome number etc.). According to Cvelev (1996) single features (such as leaves) are similar to those of the derived genus in the group – *Ruppia*. Probably a heterobathmic syndrome (mixture of evolutionary derived features with the primitive ones) exists here. It is difficult to determine the phylogenetic position of such taxa. The cladistic approach used by Les et Sheridan (1990) seems to indicate that the studied group is a derived one close to the group *Pusilli* in *Potamogeton*. Their opinion (Les et Sheridan 1990: 49) is: "Cladistically, *Coleogeton* represents a highly specialized group of homophyllous linear-leaved species, rather than an ancestral lineage in *Potamogeton*". These authors accept the main dividing line within *Potamogeton* s.l. to be between heterophyllous and homophyllous types. Later, however, Les et Haynes (1996) do not mention this previous opinion again. On the basis of Les and Sheridan's cladograms, as well as on the results of their own studies of generative structures (e.g. the presence of the same type of stigma etc.), Terjochin et Čubarov (1996), as well as Preston (1995), did not accept *Stuckenia* as a separate genus. In my opinion, the above given characteristics of that group makes it possible to accept it as a taxon at generic rank. Some relationships to *Zannichellia* also seem to exist (Les, Cleland et Philbrick 1996). The distribution of the genus is cosmopolitan, what follows from the nearly cosmopolitan distribution of *Stuckenia pectinata*.

List of *Stuckenia* taxa

The following list of names of species and subspecies referring to *Stuckenia* is divided into four groups: 1. species with names already including the generic name *Stuckenia*; 2. proposals of new combinations of species names with that generic name; 3. analogical proposals for nothospecies. As the genus contains a series of unclear taxa, a fourth group is added – 4. list of taxa (species and subspecies) with uncertain, unclear or questionable taxonomic values or taxa newly described, at present not well or not sufficiently known (especially to the present author), requiring further studies and evaluation by specialists.

As the name *Stuckenia* Börner was published in two of Börner's publications published at the same time (cf. Stafleu et Mennega 1993), the correct publication place of *Stuckenia* should therefore be given as follows: *Stuckenia* Börner, Abhandl. Naturwiss. Ver. Bremen 21: 258, 1912 (V.–VIII.); Fl. Deutsch. Volk, 49, 1912 (VI.–VII.). Index nominum genericorum (FARR et al., 1979) gives only the first citation with the publication date IV. 1912, differing from that given later by Stafleu et Mennega (Stafleau being the co-author of both publications).

I. Previously published names of accepted species in *Stuckenia*:

1. *Stuckenia filiformis* (Pers.) Börner Fl. Deutsch. Volk, 713, 1912.
2. *Stuckenia pectinata* (L.) Börner Fl. Deutsch. Volk, 713, 1912.
3. *Stuckenia vaginata* (Turcz.) Holub, Folia Geobot. Phytotax. 19: 215, 1984.

II. Proposals of new nomenclatural combinations for accepted species in *Stuckenia*:

1. ***Stuckenia amblyphylla* (C. A. Meyer) Holub, comb. nova**. – Bas.: *Potamogeton amblyphyllus* C. A. Meyer, Beitr. Pflanzenkunde Russ. Reiches 6: 10, Sankt Peterburg 1849 [ut "*amblyophyllus*"].

2. ***Stuckenia borealis* (Rafin.) Holub, comb. nova**. – Bas.: *Potamogeton borealis* Rafinesque, Med. Repos., Hexade 2/5: 354, New York 1808.

3. ***Stuckenia* /×?/ *helvetica* (Fischer) Holub, comb. nova**. – Bas.: *Potamogeton vaginatus* Turcz. var. (vel subsp. ?) *helveticus* Fischer in Baumann Die Vegetation des Untersees (Bodensee), p. 111–114 et 142–149, Stuttgart 1911 /n.v./; *P. helveticus* (Fischer) W. Koch, Mitteil. Naturf. Ges. Schaffhausen 1923–24/3: 38, 1924 /n.v./; E. Baumann, Veröff. Geobot. Inst. Rübel Zürich 3: 594–595, 1925. [An *Stuckenia filiformis* (Pers.) Börner × *S. vaginata* (Turcz.) Holub ?].

4. ***Stuckenia interior* (Rydb.) Holub, comb. nova**. – Bas.: *Potamogeton interior* Rydberg, Fl. Colorado, p. 13, Fort Collins 1906.

5. ***Stuckenia striata* (Ruíz et Pavon) Holub, comb. nova.** – Bas.: *Potamogeton striatus* Ruíz et Pavon Fl. Peruv. 1: 70, [Madrid] 1798.

6. ***Stuckenia subretusa* (Hagstr.) Holub, comb. nova**. – Bas.: *Potamogeton subretusus* Hagström, Kungl. Svensk Vetenskapsakad. Handl. 55/5: 30, Stockholm 1916.

III. Proposals of new nomenclatural combinations for nothospecies in *Stuckenia*:

1. ***Stuckenia* ×*bottnica* (Hagstr.) Holub, comb. nova**. – Bas.: *Potamogeton bottnicus* Hagström, Kungl. Svensk Vetenskapsakad. Handl. 55/5: 53, Stockholm 1916. [= *Stuckenia pectinata* (L.) Börner × *S. vaginata* (Turcz.) Holub].

2. ***Stuckenia* ×*fennica* (Hagstr.) Holub, comb. nova**. – Bas.: *Potamogeton fennicus* Hagström, Kungl. Svensk Vetenskapsakad. Handl. 55/5: 24, Stockholm 1916. [= *Stuckenia filiformis* (Pers.) Börner × *S. vaginata* (Turcz.) Holub].

3. ***Stuckenia* ×*suecica* (K. Richter) Holub, comb. nova**. – Bas.: *Potamogeton* ×*suecicus* K. Richter Plant. Europ. 1: 15, Leipzig 1890. [*Stuckenia filiformis* (Pers.) Börner × *S. pectinata* (L.) Börner].

IV. Unclear and new taxa not sufficiently known to the present author:

(The taxa are listed by their highest taxonomic rank.)

1. *Potamogeton austro-sibiricus* Kašina 1986
[Newly described species].

2. Potamogeton balatonicus (Gams) Soó 1930
[Normally accepted as a subspecies of *Potamogeton pectinatus*; taxonomically unclear plants, possibly somewhat similar to *P. helveticus*].

3. *Potamogeton chakassiensis* (Kašina) Volobaev 1991
[Newly described taxon, originally classified as a subspecies, with some relations to *P. intramongolicus* Ma or identical with it].

4. *Potamogeton interruptus* Kit. in Schult. 1816.
[Normally accepted as identical with *P. pectinatus* or as its variety; see, however, the opinion by Cvelev (1996)].

5. *Potamogeton intramongolicus* Ma 1983
[Newly described species unknown to the present author].

6. *Potamogeton juncifolius* Kerner ex Fritsch 1896
[Unknown taxon; its name is absent in Index Kewensis – its publication place is Verh. Zool.–Bot. Ges. Wien 45/1895: 366, 1896].

7. *Potamogeton latior* Holub 1983
[Based on *P. latifolius* (Robbins) Morong 1893, non Sloboda 1852; Les et Haynes (1996) identified this North American species as the South American *Potamogeton striatus* Ruíz et Pavon].

8. *Potamogeton macrocarpus* Dobrochotova (1951)
[Allied to *Potamogeton pectinatus* L.].

9. *Potamogeton marinus* L. 1753
[According to many authors identical with *P. pectinatus* L. 1753; this should also be according to the selected lectotype – Haynes 1986; but see the opinion of Cvelev (1996), who distinguishes *P. marinus* and *P. pectinatus* as two separate species; in this case their nomenclature is unclear].

10. *Potamogeton recurvatus* Hagstr. 1916
[This may be a separate taxon].

11. *Potamogeton rostratus* Hagstr. 1916
[Probably a separate taxon].

12. *Potamogeton strictus* Phillippi 1860
[For me an uncertain taxon described from South America].

13. *Potamogeton zosteraceus* Fries 1828
[Cvelev (1996) accepts this taxon as a species occurring in littoral areas of the Baltic Sea].

14. *Potamogeton pectinatus* L. subsp. *mongolicus* (A. Benn.) Volobaev 1991
[Taxonomically unclear taxon].

Note. A further nomenclatural problem may be connected with the uniting *P. marinus* L. 1753 with *P. pectinatus* L. 1753 into one species, i.e. we do not know under which of these names such a merging was first made; this problem may be resolved during the study of older botanical works, especially those of Swedish authors.

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Souhrn

V rodu *Potamogeton* L. s.l. existuje vedle monotypické skupiny odpovídající rodu *Groenlandia* J. Gay (*Potamogeton densus* L.) další vyhraněná skupina, označovaná jako sect. *Coleophylli* W. D. J. Koch či jako subgen. *Coleogeton* Reichenb. Tato skupina sdružující druhy příbuzné *Potamogeton pectinatus* L. je nověji odčleňována jako samostatný rod, nejprve Dostálem v r. 1982 (bohužel nomenklatoricky invalidně), poté pravděpodobně nezávisle toto odloučení provedli američtí badatelé Les a Haynes v r. 1996. Přitom bylo přehlédnuto, že pro takto vymezený rod existuje již platné jméno *Stuckenia* Börner 1912 užité Holubem v r. 1984. Skupina se liší od rodu *Potamogeton* morfologicky, anatomicky, karyologicky a palynologicky; další rozdíly byly stanoveny i mikromolekulárními metodami. Fylogenetické postavení rodu *Stuckenia* není

jasné; zdá se však, že se jedná o skupinu vývojově odvozenou a specializovanou. Jméno *Stuckenia* bylo zatím použito pro 3 druhy tohoto rodu. V tomto příspěvku je navrženo 6 nových nomenklatorických kombinací pro druhy a 3 kombinace pro nothospecie tohoto rodu. Dále jsou uvedeny další taxony v hodnotě druhu či subspecie, jejichž taxonomická hodnota není jasná nebo je nejistá až sporná, resp. tyto taxony byly popsány teprve v nedávné době a nejsou ještě všeobecně dostatečně známé. Těchto 14 taxonů vyžaduje hlubší průzkum specialisty než by mohly být pro ně navrženy kombinace s rodovým jménem *Stuckenia*.

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