***Sawia gen. nov.*, and new combinations in *Sphaerochara* (*Characeae, Charophyceae*)**

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Recent phylogenetic studies of the genus *Tolypella* (A.Braun) A.Braun *sensu lato* have resulted in a better understanding of the phylogenetic affinities of many species of this genus (Pérez & al., 2014, 2017; Saber & al., 2021; Holzhausen & al., 2023; Romanov & al., 2024; Schubert & al., 2024). They showed the presence of three well-supported clades within this genus – one of the Section *Tolypella* R.D.Wood, including the type of both this genus and this section, *T. nidifica* (O.F.Müller) A.Braun, and two clades congruent with the section *Rothia* R.D.Wood, a weakly supported group. The reinstatement of the genus concept of *Sphaerochara* Mädler for one clade of *Rothia*, including the type of this section, *T. intricata* (Trentepohl ex Roth) Leonhardi, partly accommodated these results (Schubert & al., 2024) also implied by earlier morphological studies (e.g. Daily, 1969; Soulié-Märsche, 1989; Feist & Grambast-Fessard, 1991). However, the remaining part of the section *Rothia* of the genus *Tolypella* is still polyphyletic (e.g. Pérez & al., 2014, 2017; Saber & al., 2021; Romanov & al., 2024; Schubert & al., 2024) providing morphological evidence for further splitting (Sawa, 1973: 480; Pérez & al., 2014: 779; see below) thereby improving charophyte taxonomy. Consequently, *Sawia*, *gen. nov.,* and new combinations for *Sawia* and *Sphaerochara* are proposed here.

Sawia R.E.Romanov, *gen. nov.*
Type: ***Sawia boldii*** (Sawa) R.E.Romanov, *comb. nov., infra*
Registration (of name): http://phycobank.org/105334
Registration (of type): http://phycobank.org/105333
Diagnosis: *Sawia* has acute end-cells of branchlets, terminal antheridia situated at tops of rays of furcate, i.e. non-monopodial, branchlets, although antheridia are formed mostly at bases of branchlet whorls. In contrast, *Sphaerochara* has no terminal antheridia; they are situated at nodes of monopodial branchlets and at bases of branchlet whorls. In comparison, *Tolypella* has blunt, rounded end-cells of branchlets and bipartite basal plates of oospores. Terminal placement of antheridia, the presence of non-monopodial branchlets, phylogenetic affinity, and, probably, the absence of gyrogonites allow delineation of *Sawia* and *Sphaerochara*. Acute end-cells, undivided basal plates of oospores, and phylogenetic affinity allow delineation of *Sawia* and *Tolypella*.
Etymology: The feminine genus noun honours Takashi Sawa (1929–2013), a Japanese charophytologist who described two species of this genus, critically describing and illustrating a key genus trait, terminal antheridia (Sawa, 1973).

Sawia boldii (Sawa) R.E.Romanov, *comb. nov.*
Basionym: *Tolypella boldii* Sawa *Journal of Phycology* 9(4): 473, figs 1–9, 16–19, 1973.
Holotype (Sawa 1973: 476): Texas, USA: Travis Co.: Ean's Creek at the end of Hill River Road, 0.8 mi north off Barton Springs Road (= Texas State Hwy. 2244), ca. 12 mi S.W. Austin, 5 March 1972, Sawa & Silverberg 72-3-5-1 (**TRT** in **ROM**).
Registration (of name): http://phycobank.org/105336

Sawia canadensis (Sawa) R.E.Romanov, *comb. nov.*
Basionym: *Tolypella canadensis* Sawa *Journal of Phycology* 9(4): 476, figs 10–15, 20–22, 1973.
≡ *Sphaerochara canadensis* (Sawa) Soulié-Märsche (in Schubert & al.) *Charophytes of Europe*: 951, 2024

Holotype (Sawa 1973: 480): Ontario, Canada: Thunder Bay District: the shore of Lake Superior at Rossport Provincial Picnic Park, along Trans-Canada Hwy. (= Ont. Hwy. 17) 0.2 mi east of Rossport, 20 July 1970, Sawa-Hotchkiss-Thorpe 70-7-20-3 (**TRT** in **ROM**).
Registration (of name): http://phycobank.org/105337

Sawia stipitata (T.F.Allen) R.E.Romanov, *comb. nov.*
Basionym: *Tolypella stipitata* T.F.Allen *Bulletin of the Torrey Botanical Club* 10(10/11): 114, pl. 41, 1883.
≡ *Tolypella intricata* var. *intricata* f. *stipitata* (T.F.Allen) R.D. Wood Taxon 11: 23. 1962.
Holotype (Allen 1883: 115): USA: In a pond near Mt Carbon, Elk Range, western Colorado, USA, 1881, T.S. Brandegee (**NY** 00887624).
Registration (of name): http://phycobank.org/105338

Sphaerochara apiculata (A.Braun) R.E.Romanov, *comb. nov.*
Basionym: *Tolypella apiculata* A.Braun in A.Braun & Nordstedt *Abhandlungen der Königlich Preussischen Akademie der Wissenschaften* 1882(1): 98, figs 79–83, 1883.
≡ *Tolypella intricata* var. *apiculata* (A.Braun) R.D.Wood *Taxon* 11: 23, 1962.
Lectotype (designated by Wood & Imahori 1965: 747): Chile: Chili, E. Bertero 3015, Herb. Montagne (**PC**).
Registration (of name): http://phycobank.org/105340
Note: The placement of antheridia, "generally lateral to oogonium", indicated by Wood & Imahori (1965: 747) for the lectotype and excellent drawings by Cáceres (1978) is a sufficient basis for transfer to *Sphaerochara* for this little-known species (see discussion in Blindow & al., 2018).

Sphaerochara californica (A.Braun) R.E.Romanov, *comb. nov.*
Basionym: *Tolypella californica* A.Braun in A.Braun & Nordstedt *Abhandlungen der Königlich Preussischen Akademie der Wissenschaften* 1882(1): 99, figs 84–87, 1883.
Holotype (Braun & Nordstedt 1883: 100): USA: Marin County ["Maria Counts (?)"], California under willows in slow-flowing streams, 27. März 1865, H. Bolander, comm. Dr Engelmann, Aug. 1869 (**B**? not located, probably lost).
Lectotype (icons! designated here): Braun & Nordstedt 1883: figs 84–87.
Registration (of name): http://phycobank.org/105472
Registration (of lectotype): http://phycobank.org/105341
Note: The combination of monopodial sterile branchlets bearing a single node with rays, deciduous coronula, and enlarged upper parts of spiral cells, i.e. both traits characteristic of *Tolypella sensu stricto*, illustrated by Braun and the similarity to *T. nidifica* (O.F.Müller) A.Braun noted by Braun is not consistent with the decision by Wood who placed *T. californica pro parte* to synonyms of *T. intricata* var. *intricata* f. *intricata*, f. *prolifera* (Ziz ex A.Braun) R.D.Wood, and f. *spicata* R.D.Wood (Wood 1962) or *T. intricata* var. *intricata* f. *intricata*, and f. *prolifera* (Wood & Imahori, 1965), i.e. recognizing it as a collective taxon. However, the description by Braun was based on one gathering from California, and he indicated a requirement for the study of unfragmented plants, not available in the original material. Accordingly, the evidence for Wood's decision is unclear. It appears that it was not based on re-study of the original material and, probably, it is a result of his study of other Californian specimens of different taxa labelled as *T. californica* by T.F. Allen according to labels of the specimens studied by Wood (1965). Wood listed the specimen from **NY** as having almost the same data as the original material of *T. californica* except for the date and month of collection (Wood, 1965: 741). Wood recognised this specimen as *T. intricata* but illustrated it with an indication of *T. californica* as a synonym (Wood & Imahori, 1964: icon 388). However, coronulae of oogonia appear persistent, and the presence or absence of swelling of tips of the oogonial spiral cell is unclear according to the

drawings of this specimen. Considering the absence of any other part of the original material than the protologue the decision by Wood appears to be unacceptable and species should be kept separately until new topotype material can be examined.

Sphaerochara ramosissima (W.Pérez, J.D.Hall, McCourt & Karol) R.E.Romanov, *comb. nov.*
Basionym: *Tolypella ramosissima* W.Pérez, J.D.Hall, McCourt & Karol *Journal of Phycology* 9 (4): 785, fig 5, 2014.
Holotype (Pérez & al. 2014: 786): **NY** 01475130.
Registration (of name): http://phycobank.org/105342

Sphaerochara spicata (R.D.Wood) R.E.Romanov, *comb. nov.*
Basionym: *Tolypella intricata* var. *intricata* f. *spicata* R.D.Wood *Taxon* 11: 23, 1962.
Holotype (Wood 1962: 23): USA: Calif[ornia], no date, [J.W.] Blankinship (**NY** 00887630).
Registration (of name): http://phycobank.org/105343
Note: "*Tolypella spicata*" (R.D.Wood) R.D. Wood (1965: 781), *nom. inval.* was described as *Tolypella intricata* [var. *intricata*] f. *spicata* R.D.Wood from North America. Wood (1965) proposed a new combination and species rank for *T. spicata* in the "Microspecies appendix" without referring to the place of valid publication of the basionym (ICN Art. 41.5, Shenzhen Code, Turland & al. 2018), as well without citation of basionym rendering his nomenclatural act invalid. Thus, the new combination is suggested and species status is validated here.

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