
Transfer of *Navicula cascadenis* Sovereign to the genus *Geissleria* (Cymbellaceae, Bacillariophyta)

Rosalina Stancheva, *California State University San Marcos, 333 S. Twin Oaks Valley Rd. San Marcos, California 92096, USA* (correspondence: rhristov@csusm.edu).

Sarah A. Spaulding, *Institute of Arctic and Alpine Research (INSTAAR), University of Colorado Boulder, Campus Box 450, Boulder, Colorado 80309, USA*.

The publication of *Navicula cascadenis* Sovereign (1958: 118, pl. III: figs 32, 33) was invalid because a type was not designated, as required after 1 January 1958 (ICN Art. 40.1, Turland *et al.* 2018). The protologue included collections from Diamond Lake and Crescent Lake, both located in the Cascade Mountain Range of southern Oregon. ICN Art. 40.2 allows for an “entire gathering” to be an acceptable indication of type, but Sovereign included more than one collection, invalidating the publication of *N. cascadenis*. Sovereign (1960: 345) subsequently validated the name by designating a holotype slide in the CAS Diatom Collection.

As part of the stream bioassessment Surface Water Ambient Monitoring Program of the California State Water Resources Control Board, the first author reported *Navicula cascadenis* in a benthic sample from Hat Creek, northern California (40.851099, -121.5364; site code 526PS1724, collected on 27 June 2016) located in Lassen National Forest in the Southern Cascade Mountain Range. SEM observations of the internal view of the valve of *N. cascadenis* showed an isolated punctum in the central area (Fig. 1), striae composed of lineolate areolae lacking hymenes or internal occlusions (Figs 1, 3), and annulae composed of four to five modified areolae (Fig. 2). The isolated punctum, areolae structure, and presence of annulae are characteristic of the genus *Geissleria* following Lange-Bertalot & Metzeltin (1996).

Accordingly, we here propose a transfer of this species to the genus *Geissleria*.

Geissleria cascadenis* (Sovereign) Stancheva & S.A.Spaulding, *comb. nov.

Basionym: *Navicula cascadenis* Sovereign *Transactions of the American Microscopical Society* 79: 345, 1960

Holotype: Frustule in Slide No. 498-6 (Sovereign 1960), Diamond Lake, boat-landing on south shore, T28S, R6E, Oregon, USA, 18 August 1950, leg. H.E. Sovereign, CAS Diatom Collection Slide No. 205077, Accession No. 600782.

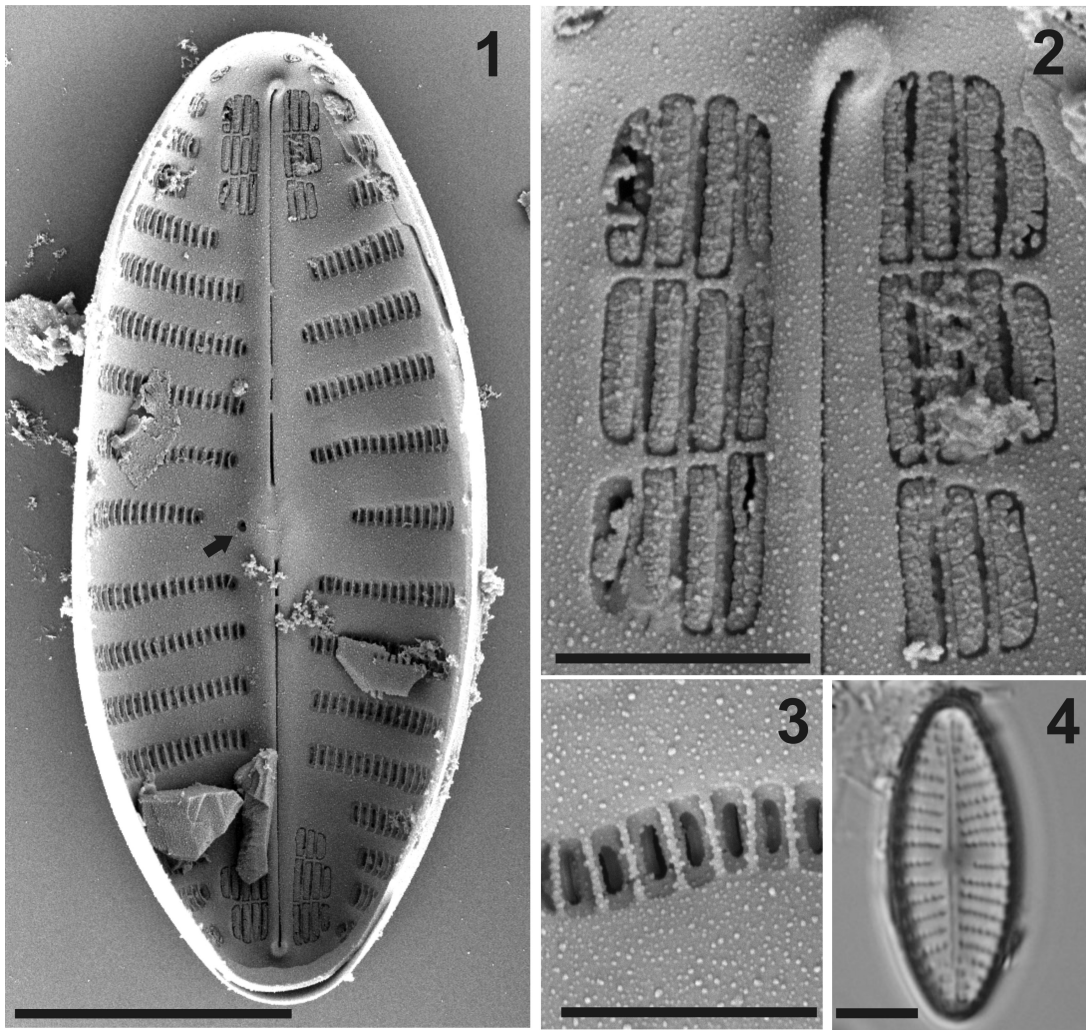
Description: Valves 6-9.6 µm wide, 10-35 µm long, with 9-12 striae in 10 µm at the valve center, and coarse areolae 25-28 in 10 µm. An isolated punctum is present in the central area (Figs 1, 4) and 3 (rarely 2 to 5) annulae at the apices (Figs 1, 2, 4). This taxon differs from other species of *Geissleria* by the lower stria density and coarser areolae (Figs 3, 4). The size range provided here includes the range documented by Sovereign (1958), Bahls (2016), and the present study.

Distribution: *Geissleria cascadenis* was initially considered endemic to the Cascade Mountains of western Oregon (Bahls 2016), but its distribution is now known to extend to the Southern Cascade Mountains in northern California. It has been reported, but not confirmed, from Rainbow Lake, Montana (Parket 1968) and the Laurentian Great Lakes (Stoermer *et al.* 1999).

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Figs 1-4. SEM and LM images of *Geissleria cascadiensis* from Hat Creek, Southern Cascade Mountain Range, California. Fig. 1. SEM image of a valve, internal view. The isolated punctum (black arrow) is central and annulae are positioned at the poles. Fig 2. SEM image of annulae, internal view. Fig. 3. SEM image, internal view of areolae. Fig. 4. LM image showing central isolated punctum and annulae at the poles. Scale bars 5 μm (Figs 1, 4), 1 μm (Figs 2, 3).