

## Taxa of the Orthoseiraceae (Orthoseirales) from Patagonia, Argentina, with comments on the circumscription of the group Arctic

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The Orthoseirales Crawford in Round et al. was described for radially-symmetrical diatoms with elongated valve mantles, which have an unusual set of processes in or near the center of the valve, mostly heavily silicified and quite distinct from the areolae. These processes were given the name 'carinoportulae' and were suggested to be diagnostic for the Order Orthoseirales and Family Orthoseiraceae. Members of this group have been assigned to a single genus, *Orthoseira*, which also lacks rimoportulae, coarse areolae and usually has thick marginal spines serving in the formation of straight-chain colonies. The genus is rather species-poor and, includes several species that show small internal depressions along the valve margin, giving the appearance of a scalloped-shape outline. *Orthoseira* species are well-known in aerophilous habitats and found on several islands.

The genus *Cavernosa* Stidolph, conversely, lacks carinoportulae and possesses rimoportulae, but like some *Orthoseira* species has scalloped-shaped margins. *Cavernosa* is chain-forming, may have marginal spines and was described from aerophilous habitats, originally from New Zealand and later reported from sub-Antarctic islands. Its placement among other members of melosiroid diatoms has not been settled, though its lack of carinoportulae precludes its placement within the Orthoseirales.

The diatom flora of Patagonia is not well known although floristic studies began in the early 20<sup>th</sup> century and continued sparsely up to date. Among them Frenguelli's surveys stand out due to their detailed taxonomic analyses. Specimens from Frenguelli's collection at the Museum of Natural History at the University of La Plata, Argentina, and more recent collections have yielded specimens with features of chain-forming frustules with thick marginal spines and presence of carinoportulae (as in *Orthoseira*) and rimoportulae (as in *Cavernosa*). We present light and scanning electron microscopic observations of these species from Patagonia, and discuss the circumscription of the Orthoseirales. We suggest that depending upon the phylogenetic position of a taxon, it might not be required to have all the features of a group to be included in it. We cite examples of this phenomenon amongst the raphid diatoms, and discuss impacts on the classification of diatoms generally.