

EXAMINATION OF TYPE MATERIAL OF ARAPHID DIATOMS (BACILLARIOPHYTA) NOMENCLATURALLY ASSOCIATED TO *FRAGILARIA*, *STAUROSIRA* OR *PSEUDOSTAUROSIRA*: A LONG HISTORY OF SPECIES CONCEPT DRIFT

Eduardo A. Morales^{1, 2}, Carlos E. Wetzel³, Bart Van de Vijver⁴, Maria Helena Novais³, Lucien Hoffmann³ & Luc Ector³

¹Herbario Criptogámico, Universidad Católica Boliviana San Pablo

²Patrick Center for Environmental Research, The Academy of Natural Sciences

³Public Research Centre - Gabriel Lippmann, Department of Environment and Agro-biotechnologies (EVA)

⁴National Botanic Garden of Belgium, Department of Bryophyta and Thallophyta

The study of type material in diatom research is important to help define the original concept of taxa, especially at the genus and lower taxonomic ranks. Analysis of type material and of additional geographically spread populations using light (LM) and electron microscopy (EM) becomes crucial in establishing boundaries for a taxon, which could then lead to its better identification in field collected samples, thus improving the accuracy of – for example– environmental assessments. This thorough characterization of taxa would allow the recognition of morphological and ecological variants that can then be proposed as new, thus making the description of diatom diversity a more accurate process. Freshwater araphid diatoms are an important group in benthic and planktonic habitats in rivers and lakes. Their contribution to total biomass can be considerable under certain ecological situations and many species are key players in food webs due to their high productivity. Despite this relevance, the identity and ecology of most araphid species is not well defined especially because many are originally only known from a single drawing; furthermore, the great majority lacks LM and EM data gathered from type material. Misinterpretation of iconotypes by subsequent authors led to considerable species concept drift so that now many frequently reported taxa differ radically from the original concept. The present study includes detailed LM and scanning EM information from the type material of several araphid taxa (*Fragilaria brevistriata* Grunow in Van Heurck, *Odontidium harrisonii* Roper, *Odontidium harrisonii* var. *beta* W. Smith, *Odontidium mutabile* W. Smith, *Odontidium parasiticum* W. Smith and *Odontidium tabellaria* W. Smith. This detailed information is also presented for geographically distinct populations of these taxa in Europe and elsewhere. Finally, an assessment of the morphological variability of these species is presented as an approximation of their variability in nature. It is recommended that more studies of this type should be performed in order to provide a better foundation for the identification of araphids during applied diatom studies.