Editorial

Recent progress in diatom’s taxonomy and freshwater ecology

An Ecosystem is a term used to describe species that are interacting together and with their environments (Tansley, 1935). Even if obvious for scientists, the concept most important is that the functioning ecosystems are crucial for the planet by performing important biological services (Daily, 1997). The oldest and major example is photosynthetic organisms, because through photosynthesis, they release oxygen into the atmosphere and remove carbon dioxide from the atmosphere to synthesize organic molecules, diatoms releasing about 20% of the atmospheric oxygen production (Lavoie et al., 2008). Diatoms have crucial contribution to this activity as they produce between 20-40% of the total organic matter produced in the ocean, which is more than all terrestrial rainforests combined (Bowler et al., 2010). Thus, they facilitate greatly in keeping the environment healthy and fit for life. An obvious consequence of the emergence of the concept that ecosystems are rendering services is that the evaluation of these services requires the determination of the species that compose these ecosystems.

In this special issue of Cryptogamie-Algologie dedicated to the Proceedings of the 33rd Meeting of the “Association des Diatomistes de Langue française” (ADLaF), new species of diatoms are described from marine and, terrestrial, freshwater ecosystems. The paper by Van de Vijver and Cox (2015) describes Fallacia emmae as a new species of Bacillariophyta discovered during a survey of the diatom flora of several caves on Île de la Possession, the main island of the Crozet archipelago. The analysis is based on morphological observations. Almeida and collaborators (2015) described an araphid diatom, Staurosirella acidophila from Southeastern Brazil living in sites with a good ecological status, low nutrient concentrations and low pH. The discovery of new taxons in geographical areas where taxonomists have been active for generations is more unusual than from “exotic” areas that have been less explored. Wetzel and Ector (2015) describe a new diatom species – Fragilaria microvaucheriae – from freshwater environments in France. Using morphological data, the authors clarifies the relation between the new species and Fragilaria vaucleriæ (Kütz.) J.B.Petersen, Fragilaria capucina sensu auct., Fragilaria austriaca (Grunow) Lange-Bert. and Fragilaria pectinalis (O.F. Müll.) Lyngbye.

If the description of new species, especially diatoms, is regular (see Schoefs, 2013), the discovery of a new genus is more exceptional. This is exactly what Riaux-Gobin and Witkowki (2015) are reporting in their contribution: the small marine benthic diatom Pseudachnanthidium megapteropsis belongs to the order Achnanthales (Bacillariophyta) from the Scattered Islands (“Éparses”, Mozambique Channel, Indian Ocean) and from Napuka Atoll (North of the Tuamotu Archipelago, South Pacific).

As mentioned above, diatoms are abundant in oceans, lakes, ponds, rivers, marsh lands, etc. Each of these environments sheltered typical communities even if some species have a large ecological range. Because diatoms are organisms sensitive to physical and chemical conditions, hydrological exchanges and habitats (Lowe, 1974; Simonsen, 1962; Hay et al., 2000; Pan et al., 2006; Reid & Ogden, 2009; Nguyen et al., 2012, etc.), diatoms are known to be a good bio-indicator of the water quality (Schoeman & Haworth, 1986; Coste et al., 1994; Rott et al., 1998) and used to study biodiversity and the functioning of the ecosystems. Thus, it is important to