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Editorial

The “Association des Diatomistes de Langue Française” ([ADLaF](#)) is the French-speaking society dedicated to diatom science. Its 38th annual meeting held in September 2019 in Metz (eastern France, [ADLaF2019](#)) gathered 64 diatom experts from 8 countries who attended to 30 presentations (including 4 keynote lectures and an outreach event: figure 1) and 8 posters. This editorial refers to some contributions presented during the meeting, either included in this special issue of Botany Letters or published elsewhere. All contributions can be found in the book of abstracts (Laviale et al. 2019b).

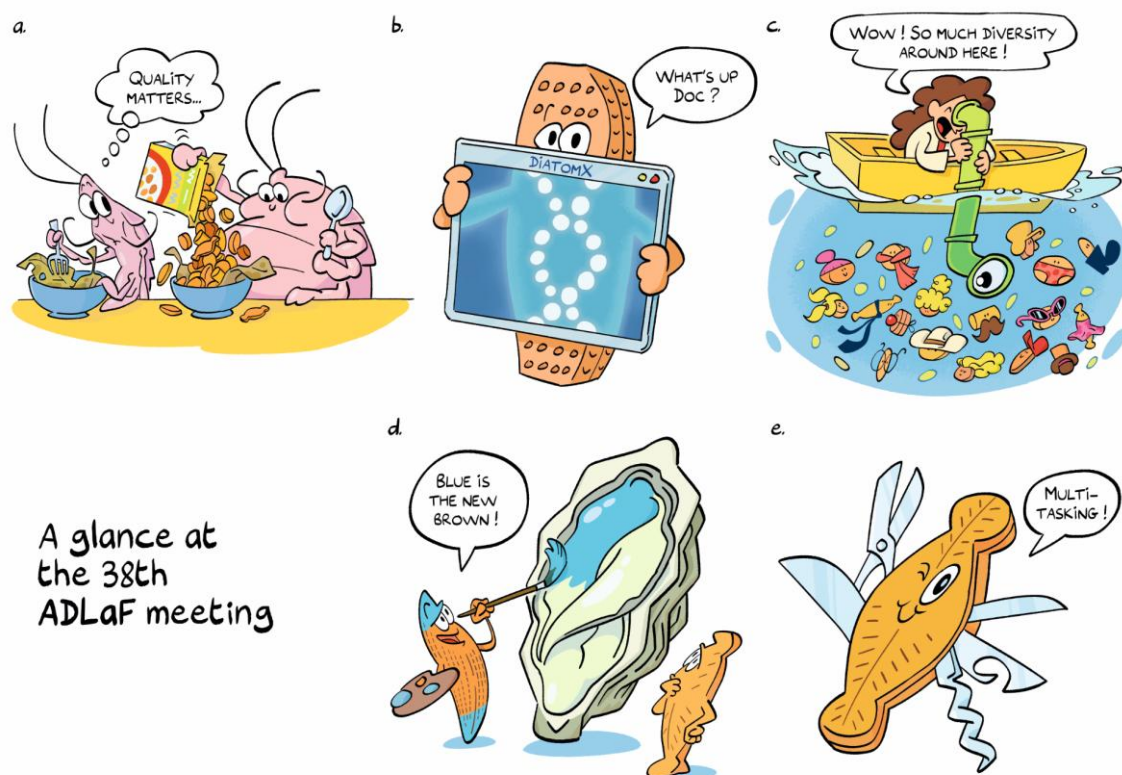


Figure 1. A glance at the 38th ADLaF meeting through the keynote lectures of M. Danger (Université de Lorraine, France: a), F. Larras (UFZ Leipzig, Germany: b), S-D. Ayata (Sorbonne Université, France: c), J-L. Mouget (Le Mans Université, France: d), and a Pint of Science outreach communication by I. Lavoie (INRS-ETE, Canada: e).

A first session dedicated to functional ecology, ecophysiology and ecotoxicology shed

light on the role of benthic diatoms in forested headwater ecosystems, yet to be clarified. Diatoms have long been considered as minor ecological players with regard to their contribution to carbon and nutrients fluxes. However, recent works have shown that they could be essential for consumers, due to their high nutritional value (e.g. Crenier et al. 2017), but also for microbial decomposers (bacteria and fungi) through complex interactions (Allen et al. 2020). Future works should evaluate the effects of already acting abiotic stressors not only on the cell functioning (Laviale et al. 2019b; Contreras and Gillard 2020) but also on these communities and subsequent consequences for the trophic networks. For this purpose, microbial fatty acids emerge as relevant proxies of ecosystem health (e.g. Fadhlou et al. 2020). Among abiotic stressors mentioned during the meeting (pesticides, nanoparticles, natural radioactivity...), the expected increase in frequency and intensity of extreme events due to climate change is a concern shared by both freshwater and marine diatomists: parallel works are ongoing to evaluate the effects of heat waves on benthic diatoms of intertidal mudflats and intermittent rivers (Béchet et al. 2017). Finally, several contributions have shown that microphytobenthos research is still very active with several ongoing European research projects studying the factors driving biodiversity and the functioning of these benthic microbial communities (Koekodder et al. 2019; Prins et al. 2020), or the biodiversity and valorisation of the 'blue diatoms' (Poulin et al. 2019) and their marennine-like pigments (e.g. Gastineau et al. 2018).

A second session gave us the opportunity to hear about recent advances in environmental risk assessment with a critical review on biofilm-based omics approaches (Larras et al. 2018, 2020; Feio et al. 2020). This was confronted to current studies within the European Water Framework Directive (WFD) implementation: improvements of existing indices are foreseen through the revision of diatom autoecological profiles or the inclusion of epibiotic assemblages (Vassal et al. 2020) while new indices are under development for overseas territories or water bodies other than rivers (lakes). Besides this policy framework, several contributions dealt with the diversity and distribution of diatoms assemblages over the world, e.g. in the global ocean (Benoiston et al. 2017) or in Antarctica freshwater lakes, thereby illustrating the usefulness of these organisms for understanding general patterns governing community species assembly across ecosystems. Diatom biodiversity and phylogenetic studies (Lewitus et al. 2018) can also help in reconstructing paleo-environment or even more

recent historical events, as shown by a striking contribution documenting diatoms found on the hair of Holy Mary-Magdalene relics (Morin et al. 2020).

Tradition has it that, a last session was dedicated to diatom taxonomy based on the morphology and ornamentation of their silicified exoskeleton (frustule), with a significant contribution to this knowledge by non-academic experts. In particular, three new species of *Surirella* (Liu et al. 2020) and *Punctastriata* (Wetzel and Ector 2020) were described while the study of Heudre et al. (2020) focused on the rarely described flora of continental brackish ecosystems.

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