Reports

13th Symposium on Aquatic Microbial Ecology (SAME 13), on the path to SIL 2016 in Torino, Italy

The road to the SIL Congress 2016 in Torino (Italy) is long and made up of many steps. Both national and international conferences preceding the SIL Congress in 2016 offer opportunities for publicizing the main event and are a testing ground for its organizational structure.

The SAME 13 conference is an example of one such preceding meeting, which was held from 8 to 13 September 2013 in Stresa (Italy), on Lake Maggiore, a few km from the Institute of Ecosystem Study (CNR ISE) that will host this conference. The SAME 13 has been a great success both from the scientific and organizational points of view. In fact, the number of participants has doubled compared with the previous SAME. There were in total 460 participants from 58 countries. In the course of a week, a complex and accurate picture of the state of global research on the microbial ecology of our planet's waters was presented.

What emerged was the great dynamism of researches in aquatic microbial ecology despite an overall scarcity of funding and adequate infrastructure, afflicting especially the less wealthy and economically afflicted countries. Thus, it became clear that large and expensive trans-oceanic cruises and great polar expeditions are certainly not the only frame in which aquatic microbial ecology can or will have to develop. An increasingly wide space is left to less expensive "in house" research which, thanks to the latest cutting-edge technologies, promises to allow us to take a fundamental leap forward in our understanding, and therefore management, of the "water-world" in the next 5-10 years. In addition, the proliferation of subfields in life sciences from the 1980s that led scientists to become increasingly specialized in narrower disciplines and their techniques seemed a bit outdated. The present day request is for a research approach that combines the same team skills in genetics, microbiology, ecology, evolution biology, chemistry and physics. In other words, there is a renewed appreciation of interdisciplinary approaches that prefigure significant changes in scientific research on environmental issues in the coming years. This call for interdisciplinary research is received well in limnological research, which has always been characterized – it is hardly necessary to recall it – by cross-disciplinarity since its early days. Also for this reason, the SIL Congress in Torino in 2016 promises to produce insights into the intersection of sciences involved in limnology, following from the themes that the SAME 13 has opened up.

A plenary lecture during SAME 13 at Congress Palace in Stresa (Italy)

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Lake Balkhash, Kazakhstan: Can we predict its future from our knowledge of the past and present developments?

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Lake Balkhash (Fig. 1) is a terminal lake in eastern Kazakhstan, located in a desert. Its area varies with its water level and is 17000-22000 km^2. The lake extends from east to west by ca 588-614 km, and is from 9-19 km wide in its eastern section and 74 km wide in its western section. In the 1960s, maximum depth was 26.5-27.0 m, and the volume was 122 km^3. Lake Balkhash is divided into two relatively independent sections: a wide and shallow western section and a deep (to 27 m) and narrow eastern section. These sections are connected by the narrow (3.8-4.2 km) and shallow (2.8-3.3 m) strait of Uzun-Aral. Climate in the region is arid, sharply continental. Annual evaporation over the lake is 950-1200 mm and annual precipitation is 150 mm. The Balkhash catchment has an area of 500000 km^2. The largest river in the basin is River Ili entering the lake's western part and contributing ca 80% of total annual inflow averaging 15.6 km^3. Other large rivers are Karatal, Lepsy, Aksu and Ayaguz entering the eastern part and contributing 6.4 km^3 per year (Fig. 2). Because of division into two sections of unequal size, with most inflow into the western section, salinity in West Balkhash is low (1.1 g/l), whereas in East Balkhash, salinity is higher (4.3 g/l) (Aladin, Plotnikov, 1993). Almost fresh water of the western lake part is used for drinking and industrial supplies. Ionic composition Balkhash water is distinctive. The proportion of chloride is 2-3 times lower than the proportion of chloride in the sea. However, the proportions of potassium, calcium, magnesium, sulphate and carbonate/bicarbonate ions are significantly higher. In eastern Balkhash, the proportion of potassium ions is very high in comparison with other waters. The lower proportion of calcium ions, especially in comparison with the Aral and Caspian seas, also is notable (Anon., 1984). Of special note, ionic composition of Balkhash water (high concentrations of potassium and magnesium; compared to other large saline continental water bodies) is considered to be unfavorable for the biota (Karpevich, 1975).

The western part of Balkhash has a freshwater salinity zone. Eastern Balkhash refers to transitional brackishwater-freshwater salinity zone (Fig. 2). They are divided by δ-horohalinicum. In the western part of the lake freshwater and euryhaline aquatic hydrobionts are predominating, but in the eastern part freshwater organisms are disappearing (Aladin, Plotnikov, 2013).