

‘What’s going on in Argentina regarding Microbial Ecology?’

The interest about Microbial Ecology in Argentina has significantly increased in the last years. The research groups working in this area are dispersed across the country and came from Schools belonging to a long tradition of scientific research in basic microbiology, agriculture microbiology, plant-microbe interactions and ecology. Agriculture and lately, bioremediation are the main areas driving these studies. Remarkably, academic interest in microbial ecology is currently being matched by the official Argentinean scientific policy, as defined in the Strategic and Priority Areas of research by the Ministry of Science, Technology and Innovative Production (MINCYT, www.mincyt.gov.ar). Although it is not referred to as “microbial ecology”, several topics in this field has also attracted the attention of the most innovative farmers, belonging to the Argentinean Association of no-till Agriculture Farmers (AAPRESID, www.aapresid.org). Thus, we foresee a potential for productive partnership and interactions among researchers, policy makers, and the productive sector.

1. Scientific society

There is not a national scientific society especially devoted to Microbial Ecology, but there are two main Microbiological Societies, which include topics in Microbial Ecology are extensively covered .

One of them is the *Division for Agricultural and Environmental Microbiology* (DAEM) belonging to the Argentinean Association of Microbiology (AAM), <http://www.aam.org.ar/dimaya.shtml>. The DAEM-AAM originated in 2005 by a group of microbiologists, mostly working in applied microbiology, who joined the AAM with the aim of expanding the historical AAM interests beyond clinical microbiology. Given the interest and motivation of the group, many activities were issued as workshops and courses. As a consequence of their work, in 2010 it was held the I Congress of Agricultural and Environmental Microbiology in Argentina where 207 works were presented, 105 for Agricultural Microbiology and 102 addressed environmental microbiology issues. The meeting got sponsors from private companies related to microbiological activities. An important satellite meeting was simultaneously organized as the First Argentinean Workshop on Rhizosphere, Biodiversity and Sustainable Agriculture, gathering 19 national speakers and 9 international invited speakers. The Proceeding of this Workshop will be soon published in Applied Soil Ecology. This Division of the AAM has organized a local Network of Quality Assurance of Inoculants, a part of an Iberoamerican Network (REDCAI), which has already published local technical reports.

The other Society is the *Argentinean Society for General Microbiology*, Spanish acronym SAMIGE, www.samige.org.ar, the result of the gathering of scientist working in basic microbiology, that realized about the lack of a national meeting were they can discuss all together instead of being spread in many different general meetings organized by big scientific societies (Biochemistry, Microbiology (mostly oriented to medical microbiology), Soil Science, Plant Physiology, Ecology). SAMIGE was created on May 26, 2004, and has organized 7 meetings so far (2004-2011), attended by a growing number of participants. The main objective of the annual meetings of this society is to promote scientific exchange between researchers across the country, to develop its activities in

the general field of microbiology, considering the areas of Biodiversity, Bioremediation and Biocontrol, Biotechnology and Fermentation, Interactions Prokaryotes - Eukaryotes, Molecular Microbiology, Soil and Environmental Microbiology and Metabolism and Physiology. At present the SAMIGE has 410 active members (166 senior researchers and 224 partner members as PhD students and Posdoc). In the last meeting (2011) there were 300 participants and 154 communications, 8 of them being addressed specifically to environmental microbiology / microbial ecology.

- Other scientific societies in which researchers address occasionally the topics in “microbial ecology” are the annual meeting of the Argentinean Societies of Biochemistry and Molecular Biology (SAIB), Plant Physiology (SAFV), Soil Science (AACCS), Ecology (AAE).

2. Research activities

Research activities in Argentina are mainly supported by official bureaus organized under the MINCYT. Each year 10-20 new projects are granted in areas related to microbial ecology as Microorganisms and Systems, Plant-Microbe Interactions, Bioremediation, Environmental Technologies. Considering that a significant part of Argentina economy is based on agriculture, oil and mining production, and that a huge diverse of environments are present in our Country research connected to areas in microbial ecology, such as soil microbiology, microbiology of extreme environments, microbiology of degraded or polluted environments, and coastal water microbiology should be on the rise.

In the last years the participation of the private sector by granting research projects has been stimulated by MINCYT. Priorities Areas have been defined at the national policy of science and the research organized in consortia have been also stimulated. Two of these consortia are presently studying different aspects of soil biology with emphasis in microbial ecology and agricultural production: a) project BIOSPAS (www.biospas.org/en) regarding the study of microbial community structure and soil function at the community level in order to differentiate between different agricultural practices, b) project SoilGeNe (<http://soilgene.net/soilgene/Welcome.html>), which applies deep pyrosequencing of soils for biodiversity studies, bioremediation and bioprospection.

Argentina has a long tradition of cooperation in research at the international level, both regionally within Southamerica, but also with bilateral cooperation with countries of all the continents and with prevalence cooperation with the EU and the USA.

3. Education

There are lots of opportunities as well as needs to develop education in Microbiology Ecology in Argentina. Most Universities have Microbiology programs; others include microbiology as a part of a broader Education Program in Biology, Biochemistry or Biotechnology.

Workshops and Post graduate courses try to complement for this lack of educational units but usually are focused in bioremediation, biofertilizers, biocontrol or soil microbiology related to agriculture production. An Educational Program with organized correlation between Ecology and Microbiology is still lacking in our curricula.

4. Practical applications

There are many possibilities of applications of Microbial Ecology knowledge in Argentina. Sustainability of Agricultural Production is an important concern nowadays for farmers, agro-based companies, and the government; bioremediation of polluted environments and treatments of industrial wastes are also important concerns in our country. Accordingly, we still need to overcome the shortage of trained microbial ecologists and environmental biotechnologists required for the design and implementation of knowledge-based technologies.

5. Your future aspects / International relations

Technologies continue to improve at rapid pace, offering growing possibilities for new approaches in microbial ecology. However, as research budgets in our region do not usually match its counterparts in more developed countries, researchers in our region struggle to have access to the most modern technologies. It is only by joining efforts that we would be able to tackle the fundamental questions posed by microbial ecology, and its application in the fields of environmental microbiology and biotechnology. In this context we envisage that ISME can play a crucial role in helping the development of human resources and research networks within individual countries as well as between countries in our region.

Ongoing projects in our region show that well-focused research may match up equivalent efforts in other parts of the world. ISME can contribute to these endeavors with programs that promote global collaboration through short-term international exchange, courses or similar activities.

Luis Wall and Leonardo Erijman, Buenos Aires, Argentina, 31 August 2011