

Past, present and future of extremophiles

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Published online: 21 December 2007
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In June 1965, Professor Thomas Brock, a microbiologist discovered in the thermal vents of Yellowstone National Park a new form of bacteria, *Thermus aquaticus*, that can survive at near-boiling temperatures. His findings paved the way for a new thermophilic microbiology: taxonomy, physiology, enzymology, molecular biology, genetics and industrial applications.

Three years later, in 1968, I was visiting Florence, Italy, looking at the Renaissance buildings, so different from Japanese architecture. “There might be a whole new world of microorganisms in unexplored environments,” I thought. “Could there be an entirely unknown domain of microorganisms at alkaline pH?” Upon my return to Japan I prepared an alkaline medium containing 1% sodium carbonate, put small amounts of soil collected from various areas around the Institute of Physical and Chemical Research (RIKEN), Wako, Japan, into 30 test tubes, and incubated them overnight at 37°C. To my surprise, various microorganisms flourished in every test tube. This was my first encounter with such bacteria. I named these microorganisms that grow well in alkaline environments “alkaliphiles.” Over the past three decades I have focused on the enzymology, physiology, ecology, taxonomy, molecular biology and genetics of alkaliphilic microorganisms to establish a new microbiology of alkaliphilic microorganisms (Horikoshi 2006).

Thermophiles and alkaliphiles are now just two examples of extremophiles, microorganisms capable of living under extreme conditions. Other extreme habitats where interesting bacteria live are those with low pH, high salt, high pressure, low temperature, etc.

At the middle of 1995, Springer-Verlag and I agreed to launch a new journal for microbiologists working on extremophiles. In June 1996 the first International Conference for Extremophiles was held in Portugal. During the meeting I discussed the new journal, *Extremophiles*, with many distinguished microbiologists and received a strong positive response. In 1997 the first issue of the journal was published, of which I was the first Chief Editor. The first page was the splendid review paper written by Professors Garabed Antranikian, Mosse Rossi et al.

An International Conference for Extremophiles has been held every other year since then: Japan 1998; Germany 2000; Italy 2002; USA 2004 and France 2006. These meetings, of course, have tremendously advanced extremophile microbiology.

In order to promote this field further, as the launch President with the collaboration of the managing editors of *Extremophiles*, I set up the International Society for Extremophiles in 2001. After the conference in USA, I retired the launch President and Professor Garabed Antranikian was elected President.

I have worked very hard and spent a lot of time editing the Journal over 11 years since 1997, and now *Extremophiles* has grown to become the journal for basic research and biotechnologies. *Extremophiles* is not limited only to the microbial field but should also cover nano-size creatures (nanoanimalculae), higher living creatures, such as plants,

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insects, fish, etc. Professor Antranikian will take over the position of Chief Editor from 2008, and he is expected to expand the journal into new fields of extremophiles.

The studies of extremophiles is expanding quickly from the planet Earth to other planets. We do not put new wine into old wineskins. What are the next lines? It is very difficult to predict now.

Only time will tell.

Koki Horikoshi
Chief Editor, *Extremophiles*
October 2007

Reference

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