Converting Knowledge to Business

Indica Rice BAC Libraries™

Rice is a leading grain crop and the staple food for over half the world population. Rice is also an ideal species for genetic and biological studies for cereal crops and other monocotyledonous plants because of its small genome and well-developed genetic system.
To facilitate rice genome analysis leading to physical mapping, the identification of molecular markers closely linked to economic traits, and map-based cloning, we have constructed bacterial artificial chromosome library (**Indica Rice BAC Libraries™**) in collaboration with Dr. Rod A. Wing, CUGI, Clemson University, of two superior indica varieties of rice 'SWARNA' and 'BASMATI' which represent the two major genomes of cultivated rice, both are leading commercial varieties and widely used germplasm in rice breeding programs. An entire representative and genetically stable BAC library of rice genome from Swarna and Basmati has been constructed by the **Seed for Food Group** at **Avesthagen** This has been systematically analysed by restriction enzyme fragmentation and polyacrylamide gel electrophoresis. The BAC recombinant transformants were picked at random and analyzed for the size of inserts, which was observed to be of 120 kb in length on average.

Avesthagen has a library of > 50,000 such BAC clones. Large scale DNA sequencing of individual chromosomes could now be initiated simply by selecting and sequencing the minimally overlapped BAC clones of the contigs. We are now in the process of mapping the contigs to chromosomes.

	Oryza sativa (indica) var.	
	Swarna *Hind*III BAC Library	Basmati *Hind*III BAC Library
Number of Clones	73728	55296
Average Insert Size	119.83	112.4
Insert size range	36.7 kb - 238.76 kb	15 kb - 317.58 kb
% Empty vector	< 0.5	5.2
% Chloroplast DNA	2.6	3.6
Genome Equivalents	20.5	13.73

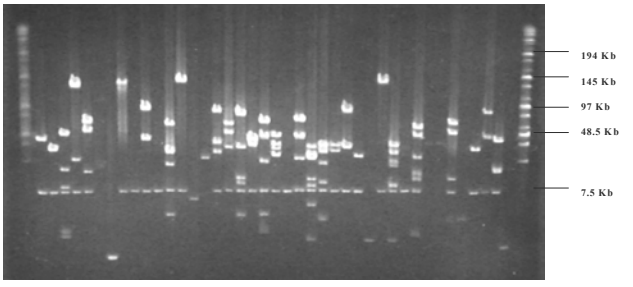

Figure 1. Sizing of Rice BAC library inserts. An ethidium bromide stained gel of plasmid DNA digested with *NotI* enzyme to release the rice genomic inserts from the 7.5 Kb vector, pIndigoBac536. Lane 1 and 43 contain λ mid-range PFGE size markers (New England Biolabs)