

Sub-project 6

Management of Veterinary Type Culture Collection (VTCC)

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Agriculture is the lifeline of our nation and agricultural research has always been the priority. The Indian Council of Agricultural Research is also engaged in developing resistant varieties of crop plants to resist abiotic stresses, for which useful traits of microbes capable of growing naturally in such conditions can be exploited. The understanding of mechanisms of their survival in such conditions will lead to finding ways to use them favourably and effectively. The Veterinary Type Culture Collection is one such step from ICAR in this direction where microbes of animal origin may be utilized effectively for boosting overall livestock development through such research efforts which will ensure human and animal health, conserve ecosystem and biodiversity, and will help in realizing the goals of “One-Health” which will ensure a sustainably healthy ecosystem.

It is beyond any debate that the world is full of microbes, which not only are harmful to livestock and human health but also are useful and supportive to them. This diversity of microbes of animal origin would be harnessed and exploited by maintaining them as references for future and mining the meta-data associated with them in order to search for traits which may be useful for the mankind. The research for utilizing such traits or microbes would lead to food safety, nutritional security, as well as human and animal welfare through disease control and eradication.

Microbes have shaped the human evolution, are continuing to do so now, and will continue to influence human and animal life in future as well. Microorganisms have acquired a special status since time immemorial for their use in enhancing livestock productivity and role in causing diseases in animals and human beings. With ever-changing climate, the microbes portray inimitable evolution process. The tapping of useful traits of the vast microbial diversity is the key to successful microbial research and its practical utility. The research in microbiology is based on harnessing the immense potential of the microbes to make animal and human lives secure and to study the ways in which microorganisms act for utilizing resources or causing disease.

The research pertaining to use of microbes of animal origin is based on the two fundamental features; firstly to search for novel products from the microbes for the benefit of human kind, and secondly, to study the pattern in which these organisms behave so as to harness the most from them in terms of overall livestock development and improving human lifestyle through searching for newer molecules, products, and processes in order to develop safer and cheaper diagnostics, vaccines and therapeutic strategies to combat the harmful organisms on one side and utilizing the best of the useful microbes for efficient utilization of feed and fodder, and developing livestock products (including dairy products) where in dairy and rumen microbes play significant roles.

Considering this, VTCC aims to harness maximum opportunities in the field of microbiology for the benefit of end-users, comprising farmers, entrepreneurs in biological development & food industry, researchers, practitioners and others. Efforts would be to

enhance its capacities in microbial repository management for making them available for enhancing livestock productivity through use of microbes. The mandates of VTCC are:

- To act as a national repository of microorganisms of animal origin, including recombinant cultures and plasmids.
- Exploration, collection, identification, characterization and documentation of animal microbes.
- Conservation, maintenance, surveillance and utilization of animal microbes for R & D.
- Human Resource Development (HRD)

For conservation, maintenance, surveillance and utilization of animal microbes as well as management of microbes for understanding the microbial evolution; a strong repository of microorganisms of animal origin is essential. Thus the collection and central storage of animal microbes for conservation and utilization of microbial biodiversity is the major focus of VTCC. The VTCC is in the process of development of laboratory and infrastructure facilities and equipping them with modern instruments. Presently, a total of 1655 microbes have been accessioned in last four years. The accessioned microbes have originated from a number of animal species viz., cattle, buffalo, pig, sheep, goat, horse, donkey, camel including double-humped camel, rabbit, deer, leopard, poultry, emu, fish, tick, monkey, human etc. The microbial collection of VTCC is summarized below:

Microbial Resource	Accessioned	Under accessioning	Total
Veterinary Microbes			
Bacteria	646	291	937
Virus	127	-	130
Fungus	-	-	-
Recombinant clones	267	15	282
Phage library & Genomic DNA	27	-	165
Total	753	306	1514
Rumen Microbes			
Anaerobic bacteria	38	30	68
Fungi/Yeast	94	-	94
Methanogenic archae	08	-	08
Total	140	30	170
Dairy Microbes			
Bacteria	307	-	307
Grand Total	1655	336	1991

Considering these facts and requirement of conservation and management of vast microbial diversity of animal origin, VTCC would be a suitable partner of Biodiversity Consortia in conserving and harnessing the potential of vast microbial diversity of animal origin.