
Importance of taxonomy and its role in agriculture for capacity building for management resources

A. K. SARBHOY

Emeritus Scientist, IARI, New Delhi 110012, India



India is a region of extraordinary biological richness and diversity and includes all types of extreme climate starting from temperate to tropical which lies from Himalayas and Sikkim to the North Eastern India, hence it is a mega diversity. So far 160 countries have signed GTI under the convention of Biological Diversity and recognize the importance of conservation, sustainable use and equitable access to the genetic benefits. The shortage of taxonomic information, expertise and resources that hinder implementation of CBD.

There have been several attempts made by the taxonomists to access the need of the region including India, Nepal, Bhutan, Maldives, Pakistan and Sri Lanka & Bangladesh but so far we could not define the taxonomic needs of the region and national reports have not been submitted by many "Sacet" countries. Therefore it was difficult to give more input for variety of user group at National and regional levels. Since no single country has the expertise or funding to full document all its biodiversity, although as a basis of for management and to ensure adequate access to genetic resources and biosafety relevance of issue of Trade and IPRs is vital. In view of this there is a due need to develop an effective conservation through capacity building in South Asia and this can be achieved by involving intergovernmental process. NGO's, private sectors and other taxonomists who are working under different (CSIR, MOEF, ICAR) organizations and Agricultural University etc. There are many diverse ecosystems, which are under threat form a variety of anthropogenic causes.

The pool of taxonomic experts and supporting staff

is slowly dwindling away due to lack of funds, jobs and several have already retired or in the process of retiring. For example in India during 1965 there were more than 150 taxonomists, which has reduced to ten in various organisations with the result that there is a great setback in the conservation of biodiversity. We can not train taxonomists in three months or so because after working for 36 years on one group of fungi, we feel sometimes completely lost in identification due to lack of voucher specimens etc. The time has come that we need to train our student to take taxonomy as a carrier. We left with very few taxonomists to cover adequately the microorganisms (agriculturally important), non-vascular plants and invertebrates. It is, therefore, very important to have regional need for the maintenance and cataloguing of living microorganisms and the person who has specialization in the various groups. We do not have a good taxonomists who can identify actionomycetes, bacteria, viruses etc. in our region, hence it is essential to have an authentic National Collections of insects, nematodes, fungi, bacteria etc. with adequate funding and staff to cater the need of these collections. We should also look for uncultivable microorganisms like mycorrhiza, protozoa etc. which are beneficial for the crop yields.

Several endemic microorganisms which are yet to be categorised properly. Several 20 exicatii sets were prepared at IARI and some more to be added with important microorganisms. ICAR/IARI has established a National Bureau of microorganisms in the tenth plan but it is still in infancy due to lack of trained taxonomists, although it will take at least a decade but there are many ways in which our regional capacity can be significantly imporved with minimal expenditure. For example, the voucher specimens of native species are currently

difficult to get and this is a major factor to delivering taxonomic information as required. It should be made mandatory for taxonomists to deposit in the National Culture Collections and Harbarium. Much of the information can be provided by electronic access for South Asian Taxonomists to work on current problems.

ASIAN COLLECTION (LIST)

Culture Collection

Fungi collection	Herbarium Specimens	Cultures
IARI, New Delhi	43785	3800
MACS, Pune	27000	150
IFO (Institute for Fermentation, Osaka, Japan)	515	
National University of Singapore	100	
National Herbarium, Iran	10000	

NEW GENERA POPOSED IN FUNGAL KINGDOM FROM INDIA (1905-1996)

• Mastigomycotina	05
• Zygomycotina	03
• Ascomycotina	51
• Basidiomycotina	28
• Hyphomycetes	110
• Coelomycetes	28
• Total	225

ECOLOGICAL DISTRIBUTION OF DIFFERENT GENERA RECORDED FROM INDIA

	South India	Maharashtra	Total
Phycomycetes	97	58	155
Ascomycetes	464	248	612
Basidiomycetes	418	158	576
Fungi Imperfecti	609	362	971
Grand total	1588	826	2314

Fungi of North-Eastern India 1014 species - 398 genera
 Fungi of Sikkim 120 species - 62 genera
 Fungi of Northern India 14,000 species - 2000 genera

INDICATORS OF FUNGAL BIODIVERSITY IN INDIA

Fungi	Number of Genera	
	Recorded from India	Recorded from World
Myxomycotina	380	450
Mastigomycotina	203	300
Zygomycotina	50	55
Ascomycotina	745	2000
Basidiomycotina	232	357
Deuteromycotina	468	4096

PROGRESSIVE ENRICHMENT OF THE NATIONAL PUSA COLLECTION, AT ACBS, NEW DELHI (PERIOD 1905-1993)

Order	1905-63	1963-73	1973-83	1983-93	TOTAL
Orphtoptera	171	80	—	116	367
Isoptera	83	—	—	—	83
Hemiptera	1181	230	203	167	1801
Thysanoptera	—	143	—	—	143
Lepidoptera	3950	50	32	75	4107
Diptera	1121	10	80	89	1300
Hymenoptera	1124	127	73	73	1397
Coleoptera	2673	132	209	94	3308
Acarina	—	152	167	153	472
Others	3553	—	—	—	3554
Total	14057	524	764	787	16532

The Global taxonomy initiative and regional workshops are absolutely necessary to achieve these objectives as discussed in 1992 when Dr. Techwyn Jones put up this proposal before us. The objectives were conservation, sustainable use and the fair and equitable sharing of benefits arising from initiation of the genetic resources of biodiversity. The following points should be discussed at length.

1. Collaboration and networking among taxonomists dealing with agriculturally important diseases. This will also include greater outreach and voluntary and retired taxonomists who made a great contribution to our biodiversity. Personal communication between individuals is necessary, but poor electronic access hinders even this in many cases.
2. There is no regional directory of taxonomic institutions, experts and fields of expertise to encourage collaboration across the region which I have tried to make but failed in my exercise because Nepal, Maldives, Bhutan and Pakistan did not responded.
3. Imbalances in number of collections, experts and species. We have made a survey of supporting staff and taxonomists in India but failed in finalizing the list due to mass retirement and no new posts were created. In general, we do have taxonomists but most of them working on several diseases especially lower organisms.