



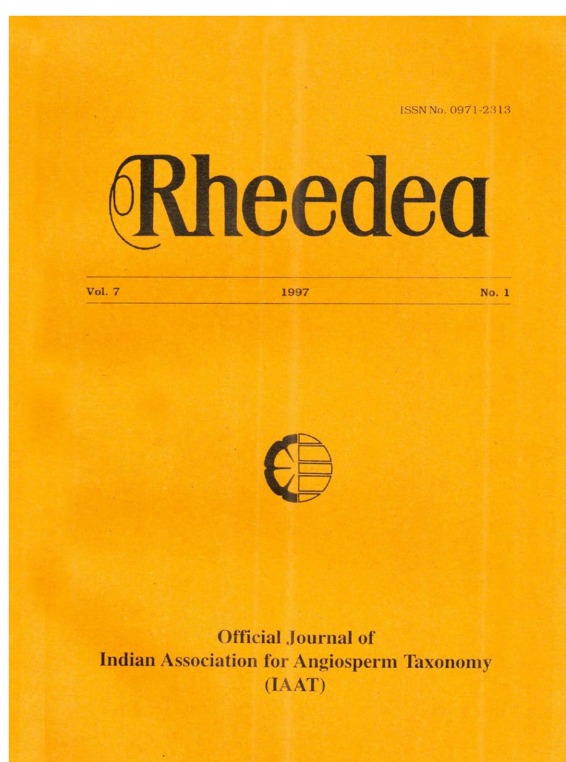
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Taxonomy Teaching in Universities and Colleges in India*

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Abstract

India is not producing enough Taxonomists now to meet its normal requirements, although with the increasing importance of its rich biodiversity and the need for its preservation the services of more Taxonomists will be needed. It is observed that the quantitative and qualitative deterioration in the taxonomic training in the country that has taken place in the recent past in our universities and colleges is not due to any serious drawback in the curricula alone and that the causes for this malady are to be looked for elsewhere. The major components directly involved in this issue are- (1) Teachers, (2) Students, (3) Facilities/Funds, and (4) Stake/Responsibility. The effects of each of these constituent units in the mechanism of Taxonomy Teaching and Training in our teaching institutions are analysed briefly. Based on what can be learned from this, some suggestions for improvement are proposed.

For the past few decades, the teaching of the subject of Plant Taxonomy had been at a low ebb. It had been considered as an old, and hence useless, subject which can offer no attraction either to the student or to the teacher. The appearance of many fashionable subjects of recent origin making use of modern technologies and sophisticated instruments, only added contempt to the neglect. The glitter is slowly beginning to fade and the importance, usefulness and dependability of classical taxonomy is being realised reluctantly by many. While the ecological and aesthetic importance of the flora has already been accepted in general, the realisation of the economic potential of the biodiversity and the necessity for its preservation for the future welfare of mankind has suddenly boosted the stock of the subject of Taxonomy. Unfortunately this wisdom dawned upon us a bit too late.

By virtue of its location in the tropical belt, with some patches of evergreen rain forests still existing in its territory despite wanton exploitation, India is very rich in its flora. With a history of thousands of years of cultural traditions and erudition, the inhabitants of this land, consisting of numerous tribes, have developed a rich store house of knowledge about the many vital uses of the local plants. For reasons that are well known, modern man is compelled to seek the help of nature

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to solve many of his complicated problems. An accurate understanding of and information about the local plant species is essential for his success in this. The mad rush to "modernisation" resulted not only in the loss of many native plants but also in the loss of indigenous knowledge about the uses as well as the correct identity of our useful local species. Perhaps one remedy that can be suggested for this malady is to resurrect Taxonomy.

While it is estimated that in the developed countries there is one taxonomist for every 10 species occurring there, in India there is only one taxonomist for every 1,000 species, even if we count such taxonomists of below average competency like myself. This poor proportion is a reflection of our inability to make optimum use of our own natural resources. India has not been able to produce enough taxonomists to meet its own need, mainly because the teaching of Taxonomy had suffered in the immediate past several decades in our universities and colleges which, after all, are the main training grounds of the technical expertise of any country. This shortage is felt in quality as well as in quantity.

The quantitative and qualitative deterioration in taxonomic training in our teaching institutions might have been due to many reasons. It is my opinion that the curricula that are being followed at present in our universities and colleges are, in general, good enough and are not the main culprits. Some notions about the possible reasons might be obtained if we analyse the components involved in the process of the teaching and training. The major components involved in this issue are:

1. *Teachers*
2. *Students*
3. *Facilities/Funds, and*
4. *Stake/Responsibility*

Let us try to analyse them briefly and understand their impacts and implications.

1. *Teachers*

The shortage of competent taxonomists had hit this component with the most devastating result. In most of the universities and colleges, Taxonomy is taught by teachers who themselves are not taxonomists and in many cases there is no love lost between them and this branch of botany. The subject of Taxonomy is thrust upon them for teaching the unsuspecting students, for want of anyone more competent and handy. Their specialisation (if they do have any) being something else, such teachers have neither any professional involvement nor any emotional attachment with the topics assigned to them. Consequently their teaching would hardly inspire any student to develop a liking of the subject of Taxonomy; if anything, it would only drive him away from the subject, perhaps with a life long dislike of it. On completion of their study, it would be such students who become teachers, who teach Taxonomy to the next generation of students, continuing this vicious circle alienating the students from the subject of Taxonomy.

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A byproduct of this situation is that the students are obliged to cram the descriptions and theories and to mechanically remember the name of the taxa. No attempt is made, or such teachers are unable, to teach the methodology of arriving at the correct nomenclature or to lucidly explain the general principles involved or the philosophy and logic behind the theories.

2. Students

As seen from the above, the students, in general, would have no special liking to the subject of Taxonomy. Compounding the situation is the lure of other modern branches that are the fashion of the day. When there is no one to advise or assist them to take up the branch of Taxonomy, which demands persistent hard toil mostly in the form of difficult field work in inhospitable terrains as well as in rustic laboratories and dusty herbaria, the student naturally opts for a subject that can be studied in comfort. The intelligent student also thinks of the job opportunities that he would have after completing his studies. Being a subject that is considered as having no 'applied value', Taxonomy would not figure in his list of priorities.

3. Facilities/Funds

Collection of plants require a good amount of field work. It would not always be possible for the student to go everywhere by walk. A vehicle is a necessity for this, which is not available in almost 100% cases. For obvious reasons, every teaching institute can not develop a sufficiently big Herbarium, even if some one is interested to do this. This means that the student has to make frequent visits to the nearest good Herbaria, which might be many hundred kilometres away from his institution, involving considerable expense. The case is the same with a Library having sufficient literature on Taxonomy. A competent guide specialised in the subject, near at hand is another rare luxury.

4. Stake/Responsibility

This is one component, the significance of which is perhaps not fully realised by the concerned. Basically, an individual goes for higher education for his own benefit. Therefore, he would choose a subject/specialisation which would be of maximum advantage for him and would settle for a subject which would give him- (1) maximum chance for obtaining a lucrative employment, (2) which is the most fashionable and popular at the time, and (3) which can be completed with the least effort and under maximum comfort. All these parameters are against choosing Taxonomy as a subject of study.

Moreover, a student or a teacher (even if he is a specialist in Taxonomy) is under no obligation to any one to study or teach Taxonomy. Nor it is the compulsory responsibility of a general teaching institute such as a University or a College, to maintain a Taxonomy department with it, particularly at a time when the subject is not wanted by any one. The student, the teacher or the Institute has no stake in the subject of Taxonomy. When it is in demand, the institutes may offer a

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course in it, the teacher may teach and the student may study. At other times, no one expects them to bother much about a subject of study which is not in demand and is unpopular.

The stake is for the nation in general and the responsibility in this case rests entirely with the concerned Governmental Agency. It is in the general interest of the country that it maintains a broad base in its technical infrastructure, so that enough trained manpower is kept available to meet any new demands and challenges and to tackle unexpected problems that might crop up in future. Being interested basically in themselves (which is natural and justifiable), individuals and institutes with fixed aims and functions, should not be expected to unnecessarily sacrifice their limited time and resources and think only about the possible future requirements of the nation. However, no far-sighted government that values self-reliance can afford to neglect such key subjects. A government that neglects this would be forfeiting its responsibility, particularly at this time when the conservation of the biodiversity and the protection of its intellectual property rights are crucial for the future welfare of a nation rich in biodiversity and traditional knowledge.

Suggestions for improvement

1. The subject of Taxonomy should be taught in universities and colleges by teachers trained in Taxonomy.
2. Special training programmes and workshops should be organised to train teachers teaching taxonomy in such institutions.
3. The training provided should be in classical taxonomy and not in narrow sub-branches of Taxonomy; after all, with all the fanfare that accompanied their birth and development, they mostly could only confirm or corroborate the existing theories and general ideas and could not make any significant new additions to Taxonomy in general. The principles of taxonomy are based on a vast amount of data obtained from diverse disciplines of science and from observations over long periods of time, so that one or two new points usually do not make much difference.
4. Principles of taxonomy and the practical methods of identification of plants should be given more stress in teaching programmes, rather than cramming of names and theories. At least in Under Graduate classes, technical descriptions and explanations should be done with the help of specimens, as far as possible.
5. More students should be attracted to Taxonomy by providing incentives such as job opportunities or development of skills for self employment. In jobs where a knowledge of biodiversity and field taxonomy are required, candidates who have specialised in Taxonomy should be given preference. Cultivation of medicinal plants, collection and marketing of genuine medicinal plants for supplying to pharmaceutical firms, identifying adulterant species to ensure authenticity of the required medicinal plants, methods of mass multiplication of useful plants that could be adopted by the local cultivators, assistance to conservation programmes, study of wild relatives of economically important plants

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that could be used for hybridization and improvement of the latter, maintenance of germ plasm collections, eco-tourism, etc., could be taught to students, to generate job opportunities and self employment opportunities.

6. Remove any possible feeling of inferiority among the Taxonomy students, by providing more funds and fellowships to the students and sanctioning more research projects in the discipline of Taxonomy. Remove the present general feeling that projects in pure taxonomy are generally not funded and that to get funding one should choose some 'modern' branch of study or 'technology' with some high sounding phrases and involving sophisticated equipments.
7. Identify active centres, and centres that could be activated, in universities and colleges and give some special assistance to strengthen the discipline of Taxonomy there, by giving support for major and minor research projects. Support should also be made available for the development and maintenance of Botanical Gardens and Herbaria, under the conservation programmes.
8. Involve State Governments and private industries to sustain Botanical Gardens, programmes for the conservation of biodiversity, particularly endemics, and in developing eco-tourism.
9. Provide assistance for the publication of popular pocket books with colour illustrations on interesting and important plants of tourist centres, with brief notes on their uses, peculiarities, flowering seasons, etc. Similar publications on the plants of important cities, famous gardens, special groups of local plants such as orchids, aroids, ferns, local medicinal species, etc. may also be encouraged by giving assistance for their printing. These will help in developing eco-tourism and a consequent increase in job opportunities, as well as creating a mass awareness about the importance of identifying plants for their protection, conservation and proper utilization.

The initiatives taken by the Government, realising its responsibility in this matter, in the larger interest of the nation in the long run, will go a long way in developing and maintaining a strong base of technical manpower in the subject of Taxonomy in the country. The wider the base of its technical and skilled man-power, the more stable and resilient will be the economy and general welfare of the society.