

OPINION

Death sentence on taxonomy in India

K. D. Prathapan, Priyadarsanan Dharma Rajan, T. C. Narendran, C. A. Viraktamath, N. A. Aravind and J. Poorani

The Biological Diversity Act, 2002 seriously curtails the scientific freedom of individual taxonomists by putting draconian regulations on the free exchange of specimens for taxonomic research and threatens to strangle biodiversity research in India with legal as well as bureaucratic control¹. Rules and guidelines framed to implement the Biological Diversity Act, which itself is flawed and based on wrong premises, reveal the appalling ignorance on the part of the implementing agencies. Guidelines accepted by the Ministry of Environment and Forests, Government of India and the National Biodiversity Authority for international collaboration in biodiversity research are testimony to this. Draft guidelines accepted by the National Biodiversity Authority stipulate that '*Exchange and transfer of dead specimens and/or herbariums (of no commercial value) on loan for taxonomic studies and return by bona fide scientists/professors of recognized universities and Government Institutions of India who are engaged in pure classical taxonomic studies shall be done through the concerned departments/Ministries of the Government of India*².' Similarly, a recent notification of the Ministry of Environment and Forests, based on the above guidelines, states that '*In case the collaborative research projects involve exchange and transfer of dead or preserved specimen(s) and/or herbarium(s) of India on loan or on any other terms for taxonomic studies as required by bona fide scientists/professors of recognized universities and Government Institutions of India who are engaged in pure classical taxonomic studies, this shall be done with the approval of concerned Departments/Ministries of the Government of India*³.' These guidelines on implementation would achieve the ultimate bureaucratic control in the history of science in India! Proponents of these guidelines have already revealed their mettle through some ludicrous suggestions to entomologists to send pictures, not (dead) specimens, for identification⁴. Being paranoid about biopiracy(!), they may even suggest that microbiologists send digital images of

microbes abroad for identification, as live cultures are required for identification and they can be easily multiplied and patented!

As we have pointed out earlier¹, biological systematics is truly international in theory and practice. Quality taxonomic research requires extensive collaboration and cooperation among specialists and institutions across continents, as the type specimens (original reference specimens) of even closely related species may be held in museums in different continents. For accurate generic and species determinations, it is essential to study specimens from across political boundaries and continents. Unless and until the type specimens are studied, the identity of the taxa concerned remains questionable. The guidelines being formulated by the Ministry of Environment and Forests and the National Biodiversity Authority should be viewed in this backdrop. It is generally accepted among the scientific community that the types are the property of science and should be made available to *bona fide* researchers throughout the world. Taxonomists not only in India, but throughout the world, depend on loan and exchange of specimens to pursue their studies⁵. It is the unwritten and binding responsibility of international institutions housing major taxonomic collections to take all necessary steps for the safe preservation of their collections (particularly name-bearing types) for posterity, make them freely accessible to the global scientific fraternity for study, and communicate information concerning type material when requested. All the major international institutions with taxonomic collections/repositories adhere to this unwritten code in letter and spirit. The Natural History Museum, London, which is the largest repository of Oriental type specimens, generously loans type specimens, from all over the world, to *bona fide* researchers in India as well as elsewhere in the world at the cost of the Museum. Legal and bureaucratic attack on this service offered by international institutes, which preserve and make specimens available for research on request, would totally isolate Indian biodiversity re-

searchers and is akin to a self-imposed siege on scientists in the country.

It has been our experience that specimens of Indian organisms are properly taken care of by the overseas museums that also make them readily available for study in India on request. On the contrary, there are several instances of damage or loss of type specimens in Indian museums because of poor infrastructure and untrained staff handling the valuable specimens in an unscientific way. In addition, Indian institutions are reluctant to send specimens on loan to researchers even in India. By depositing type specimens in different international institutions, our own interest would be protected as this would act as an insurance against loss of specimens in India and can be made available to researchers in India in future. However, the current policy of the National Biodiversity Authority completely prohibits the deposition of types of Indian organisms in international museums and insists that they should be kept only in a few 'designated' repositories in India. Credentials of these 'designated' repositories are highly questionable in terms of availability of necessary infrastructure and trained staff for curation and preservation, the safety of specimens and making them available for researchers. The need of the hour is the establishment of a state-of-the-art repository of international standards in the country. We urge the policy makers that at least until we have such a facility, let us be wise enough not to put all the eggs in the same ruptured basket!

Handling and postage of type specimens require extreme care and special training. Pinned specimens of insects and similar material are delicate and need appropriate packing for shipment. As several taxa are known only from one or two type specimens, they cannot be replaced once damaged or lost. Hence the arrangement for loan of type specimens is done with individual specialists who would take extreme personal care of the material received on loan. The guidelines proposed by the National Biodiversity Authority do not consider these sensitivities involved in the exchange or loan of specimens. No museum would send a specimen to a

Ministry or Government department, which will hand it over to a scientist after scrutiny by their officials who do not know anything about its importance or how to handle it.

We understand that the basis of the current regulations is the fear of patenting of biological material of Indian origin and the consequent loss of intellectual property rights. We reiterate that this is baseless and irrational, at least in the case of exchange of specimens for scientific research. None of the natural history museums in the world is involved in patenting or profit-making ventures. Patenting is relevant only when the biological material has a commercial value and is readily available in large quantities for industrial use as in the case of neem, turmeric or basmati rice, whereas classical taxonomists use only dead specimens of no commercial value and that too in limited numbers. They are neither available in quantities viable for commercial use nor destroyed for extraction of 'the elixir of life', that on patenting would bring infinite profits!

It is rather perplexing to note that the rules framed to regulate commercial exploitation of biological resources are being irrationally and ruthlessly imposed on fundamental research. It may be noted that basic research has been excluded from the purview of legislations like the Protection of Plant Varieties and Farmers' Rights Act⁶. Developed countries like USA, UK and Australia, with the most vibrant scientific communities, encourage experts from all over the world to work on their biota as this would fill gaps in knowledge. It is only a matter of a few days to secure a collection permit in protected areas in these countries even for foreign scientists. The experience of

Brazil, which enacted tough legislation and a long and tedious licensing process for biological collections, but repealed those provisions that prevent the exchange of specimens for basic research following protests by the scientific community of that country, is noteworthy⁷. We once again plead to all those concerned that classical disciplines like taxonomy may kindly be spared as they play the most vital role in building up a knowledge society that is intellectually self-reliant. A report of the Select Committee of the British House of Lords on Science and Technology underscores the importance of taxonomy and a healthy systematic biology community in fulfilling a country's commitments to various international treaties and conventions on biological diversity and its conservation, to which it is a party⁸. We would also like to remind that legislations like the present Biological Diversity Act are anachronisms in this flat liberalized world where India seeks foreign collaboration even in strategic areas like atomic research. Above all, putting shackles on intellectual freedom and scientific enquiry is against the basic tenets of democracy as well as the values and ethos to be upheld by a modern civic society.

1. Prathapan, K. D., Priyadarsanan, D. R., Narendran, T. C., Viraktamath, C. A., Subramanian, K. A., Aravind, N. A. and Poorani, J., *Curr. Sci.*, 2006, **91**, 1006–1007.
2. National Biodiversity Authority, Minutes of the Sixth Meeting, 20 April 2006 (http://www.nbaindia.org/docs/Sixth_meeting_minutes.pdf).
3. Guidelines for international collaboration research projects involving transfer or exchange of biological resources or information relating thereto between institutions,

including Government sponsored institutions and such institutions in other countries, Ministry of Environment and Forests notification dated 8 November 2006 (<http://www.nbaindia.org/docs/so-1911-english.pdf>).

4. National Biodiversity Authority, Minutes of the Fifth Meeting, 20 January 2006 (http://www.nbaindia.org/docs/fifth_meeting.pdf).
5. Narendran, T. C., *Introduction to Taxonomy*, Zoological Survey of India, Kolkata, 2006.
6. Protection of Plant Varieties and Farmers' Rights Act, 2001, No. 64 of *The Gazette of India Extraordinary* Part II – Section 1, October 2001, Ministry of Law and Justice and Company Affairs (Legislative Department), Government of India, New Delhi (<http://agricoop.nic.in/PPV&FR%20Act,%202001.pdf>).
7. Marina Ramalho, SciDev.Net, 12 March 2007; <http://www.scidev.net/News/index.cfm?fuseaction=readNews&itemid=3475&language=1>
8. Select Committee on Science and Technology, 2002, Third Report of the UK House of Lords; <http://www.publications.parliament.uk/pa/ld200102/ldselect/ldscitech/118/11801.htm>

K. D. Prathapan is in the Kerala Agricultural University, Vellayani P. O., Thiruvananthapuram 695 522, India; Priyadarsanan Dharma Rajan is in the Ashoka Trust for Research in Ecology and the Environment (ATREE), Bangalore 560 024, India; T. C. Narendran is in the Department of Zoology, University of Calicut, Calicut 673 635, India; C. A. Viraktamath is in the University of Agricultural Sciences, GKVK, Bangalore 560 065, India; N. A. Aravind is in the Western Ghats Invertebrate Research and Conservation Group, and J. Poorani is in the Project Directorate of Biological Control, Bangalore 560 024, India.*
*e-mail: prathapankd@gmail.com