for the year 1997 is 10 journals (Table 1).

With this backdrop, there is an urgent need to revive or resuscitate those Indian journals which are not being covered in the *SCI* at present but were very much part of the *SCI* basket, say in 1984 to begin with. This cannot be achieved overnight but the following steps are suggested: (i) A National Programme on 'Enhancing the global visibility of scientific journals published in India' needs to be initiated by someone like the National Information System for Science and Technology, Department of Scientific and Industrial Research, New Delhi; and (ii) In order to debate on the quality of scientific journals published in India on a regular basis, the Indian Science Congress Association, Calcutta should consider devoting a separate full fledged Section/Committee in its annual session on 'Indian Scientific Journals'. This initiative may help to focus the national attention on this neglected though important activity of Indian science.

One hopes these suggestions may able to bring the desired results slowly but surely.

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Hybridization: A potent factor in speciation

Tanuja *et al.*[1] strongly advocated the importance of hybridization in the speciation process in *Drosophila*, the most worked out dipteran for genetic analyses. The authors provided convincing evidence for hybrid origin of species in *nasuta* subgroup of the *immigrans* group of *Drosophila* through inter-racial hybridization experiments between *D. nasuta nasuta* ($2n = 8$) and *D. n. albomicans* ($2n = 6$) resulting in the formation of 16 new karyotypic cytoraces.

In support of their claims, hybrid origin of species has also been hypothesized in yet another dipteran, the mosquitoes[2]. Akin to *Drosophila*, species groups with its members having little or no morphological differences are abundant in all three important genera of mosquitoes, i.e. *Anopheles*[3], *Culex*[4] and *Aedes*[5], and have been the subject of genetic analyses in relation to evolution and speciation, disease transmission and control. Mosquitoes, although much known for their notoriety (being the carriers of malaria, filaria and arboviruses), are indeed equally well suited for teaching and demonstration of genetic/cytogenetic analyses. All mosquitoes have three pairs of chromosomes ($2n = 6$), have short life cycle and possess tremendous reproductive potential. Many species can easily be brought into laboratory culture and intercrossed, thus providing an ideal material for study of evolution and speciation mechanisms.

Aedes (*Stegomyia*) *scutellaris* is one such group comprising over 30 closely related species having insular pattern of distribution in the south Pacific[6]. Most species are endemic to single islands and can easily be inter-crossed in laboratory conditions. A multifaceted approach including inter-specific hybridization, cytology of species and hybrids, and population genetics was exploited to study the genetics and evolution of reproductive isolating mechanisms in this species group. These combined measures revealed that hybridization has been a potent factor in speciation together with geographic isolation and cytoplasmic differentiation[2].

Inter-specific hybridization supported allopatric mode of speciation through geographic isolation and cytoplasmic differentiation, the latter being the key factor in restricting gene flow between species[7]. Cytological analyses of species and hybrids revealed fixed inversions and chromosome size differences; the extent of chromosomal changes being parallel to morphological differences between species[8]. Further, analyses of chiasma frequencies (a measure of genetic relatedness) provided a cytological evidence for hybrid origin of species. So much so that while mean chiasma frequency was species-specific, the mean chiasma frequency of hybrids between two species was not significantly different from the third species, thus making hybrid origin more likely a process in evolution and speciation. Based on this criterion, the author was able to construct a phlogenetic tree for the species investigated[2].

In fact, hybrid origin has been considered to be the most important among transilience modes of speciation based on population genetic approach model by Templeton[9], and has been proposed by Belkin based on morphological similarities and distribution pattern in mosquitoes[10]. It is envisaged that hybridization will be accorded its due importance as a process in evolution and speciation.

1. Tanuja, M. T., Ramachandra, N. B. and Ranganath, H. A., *Curr. Sci.*, 1998, **75**, 1116–1117.
2. Dev, V., *Mosq. Syst.*, 1987, **19**, 119–126.
3. Subbarao, S. K., World Health Organization, Technical Publication, SEARO No. 18, 1998, p. 82.
4. Laven, H., *Cold Spring Harbor Symp. Quant. Biol.*, 1959, **24**, 166–173.
5. Rai, K. S., Pashley, D. P. and Munstermann, L. E., in *Recent Developments in the Genetics of Insect Disease Vectors* (eds Steiner, W. W. M., Tabachnick, W. J., Rai, K. S. and Narang, S.), Stipes Publications, Illinois 1982, pp. 84–129.
6. Huang, Y. M., *Contrib. Am. Entomol. Inst.*, 1972, **9**, 1–109.
7. Dev, V., *Experientia*, 1986, **42**, 803–806.
8. Dev, V. and Rai, K. S., *Genetica*, 1984, **64**, 83–92.
9. Templeton, A. R., *Annu. Rev. Ecol. Syst.*, 1981, **12**, 23–48.

10. Belkin, J. N., *Mosquitoes of the South Pacific*, Univ. of California Press, Berkeley, 1962.

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Response:

Our studies and observations with *Drosophila* are through long-range hybridization experiments under controlled laboratory conditions. Results of the last one and a half decade have all the indications of immense potential of interracial hybridization to result in the evolution of new races, therefore raciation. Observations of Vas Dev are mostly from natural populations of mosquitoes, and it is compatible with our studies. In fact, in *Drosophila*, we are simulating the evolutionary events of raciation through the catalytic act of hybridization, that might have occurred or is occurring in nature on an evolutionary time scale.

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Recognizing biodiversity and indigenous knowledge system under new intellectual property regime

The recognition of sovereign right of nations over their genetic resources is an advantage to the gene-rich yet technologically poor developing countries like India. These countries are being pressured under the World Trade Organization (WTO) to extend the scope of their IPR laws. This gives India which holds most of the genetic material and indigenous knowledge base an opportunity to get maximum benefit.

Our existing indigenous knowledge base is derived from the people who lived in forests over thousands of years. CBD recognizes the close dependence of many indigenous traditional and local communities embodying traditional lifestyles on biological resources and the desirability of sharing equitably benefits arising from the use of traditional knowledge, innovations and practices relevant to the conservation of biodiversity and the sustainable use of its components. Article 8, which provides for *in situ* conservation, requires each of the contracting parties, 'as far as possible and as appropriate... subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices' of indigenous and local communities, 'promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices', and encourage the equitable sharing of the benefits arising from instruments or standards which adequately recognize and protect indigenous and local communities rights over their knowledge, innovations and practices. However, there exists no mechanism to determine the scope and nature of indigenous rights and the attributes of an effective benefit sharing regime.

The first case reported in India for IPR benefit sharing is the Kani tribe (of the Agastyar Hills, S. Kerala). Tropical Botanic Garden and Research Institute (TBGRI), Thiruvananthapuram, successfully developed an antifatigue drug from a local herb, *Trichopus zeylanicus*, marketed under the trade name JEEVANI. On the contrary, to cite development of Memory Plus from *Centella asialica* by CDRI, Lucknow, tapping our traditional knowledge from *Atharvavedas* leads us to discuss the critical issue of benefit sharing mechanism. Traditional knowledge innovations have attributes of collectiveness and continuity over generations. These are different from the attributes for IPR protection, particularly, patent protection. What protection can be conceived for these?[1] There appears to be growing interest in the screening of Indian genetic resources for commercial as well as academic purposes by multinational companies. There is a pressing need for formal arrangement of transfer of genetic material from one country to another under the Material Transfer Agreement (MTA). In the multilateral negotiations, India along with other developing countries is arguing for disclosure of: (i) source of genetic material, and (ii) prior knowledge and adherence to the MTA in the patent application. As per CBD, the respective national government has the authority to determine access to genetic resources. The CBD provides that a donor country should be benefited through any of the three mechanisms: (i) participation in research (Article 15.6), (ii) sharing in the results of research and proceeds of commercial exploitation (Article 15.7) and (iii) access to and transfer of derived technology (Article 16.1).

IPRs do not cover the traditional knowledge base of local communities. This allows MNCs to exploit the resources and use the knowledge of indigenous communities to manufacture high-value products without acknowledging traditional communities. Robert Larsen, timber importer from US got a clearance for the pesticidal neem extract called margosan-0 from the US Environmental Protection Agency (EPA) and sold its patent to W. R. Grace & Co. This led to a furore in India especially in our scientific community, industries and NGOs which asserted that MNCs have no right to exploit our indigenous knowledge and research commercially. Similarly, a Japanese company has bagged the patent for a plant, *Gymnema silvestra* used as an anti-diabetic drug in traditional remedy in Assam. A recent landmark verdict of revocation of a pat-