

CORRESPONDENCE

Medical research in India

In spite of a brave defence put up by Ramamurthi¹ with regard to the write-up of Arunachalam² and comments of Valiathan³, the fact remains that the Indian medical research continues to be pedestrian. I list a few correctable shortcomings, which may be helpful.

1. One of the serious drawbacks in medical research in our country has been the isolation of medical sciences from other branches of science and technology. Help from chemists for analysis or synthesis of chemicals and drugs, engineers to shape or build equipment or biologists for comparative studies is often not sought. The Medical Council of India must allow employment of at least one staff member from these specialities in basic science departments of medical colleges for such interaction.

2. Often the medical researcher is at a loss for information and does not know where to direct his queries. I give a few examples: (i) Whom do I contact to build a piece of equipment to measure the short circuiting current across a membrane? (ii) Is there a source other than 'Sigma' for collagenase? (iii) Can somebody teach me the technique of isolation of cardiac muscle cells from mice? (iv) Is the cell line from colonic carcinoma available in India? (v) Is it true that herbal treatment of Walajah is superior to allopathic medicine in curing Hepatitis A?

I suggest that we should establish a 'Science and Technology Information Centre' suitably manned by sympathetic and patient scientist-counsellors to help out researchers in this regard. Bringing out a directory of 'Who is doing what in Indian science' is also a good idea.

3. In recent years I have been a witness to the exodus of a large number of medical researchers from basic laboratory-oriented science to epidemiology. I am afraid this will further compromise the few gains we have made on the scientific front. Even the funding by ICMR seems to be tilted in this direction. A corrective action in this area is urgently needed.

1. Ramamurthi, B., *Curr. Sci.*, 1997, **73**, 7.
2. Arunachalam, S., *Curr. Sci.*, 1997, **72**, 912-922.
3. Valiathan, M., *Curr. Sci.*, 1997, **72**, 911.

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SCIENTIFIC CORRESPONDENCE

Is *Eremostachys superba* Royle ex. Benth really at the verge of extinction?

In a note published in these columns, Rao and Garg¹ state that *Eremostachys superba* Royle ex. Benth, an exquisitely beautiful wild ornamental of Lamiaceae, is near extinction and 'might breathe its last in the coming 4-5 years itself if no effective conservation measures are

initiated'. Their conclusion is based on the fact that the *Indian Plants Red Data Book-I* (ref. 2) put the number of plants of the species in its type locality Mohand, Dehradun (UP) at 100. Ten years following publication of this book, Rao and Garg¹ found that the number of

individuals has reduced to an all-time low of 25. This alarming decline and the doubt whether the process of eminent extinction can be reversed is reflected by the title of their note - Can *Eremostachys superba* Royle ex. Benth be saved from extinction?

As a follow up of publication of this note, we scanned the *Flora of British India*³ and some regional floras^{4,5} published thereafter, to list the places wherefrom the species has been reported and collected in the past. Literature survey has revealed that apart from Dehradun (Mohand and Rajaji National Park), the species has also been reported from Domel in Jammu division of the J&K state⁴ and from Kangra in HP⁵. Survey teams were sent to Domel, 25 km north of Jammu city, in March 1996. The team has spotted a population of about 400 plants. This discovery should put at rest the alarm raised about the immediate extinction of the species by Rao and Garg¹. Discussions held with some Gujjars, Bakerwals and other aboriginals of the area, knowledgeable about the plant, indicate possibility of occurrence of the species elsewhere in the state also. Surveys proposed for next year alone can confirm the claims.

At Domel, plants of *E. superba* grow in, and on the edges of agriculture fields, in association with such other plants as *Blumea mollis* Merr., *Micromeria biflora* Bth., *Lamium amplexicaulis* Linn., *Vicia sativa* Linn., *V. hirsuta* Gray., *Adhatoda vasica* Nees., *Allium rubellum* M. Bieb., *Ageratum conyzoides* L., *Trifolium fragiferum* L., *Carissa opaca* Stapf. ex. Haines, etc. Plants of *E. superba* are robust, ranging between 42 and 135 cm (\bar{X} = 97.75 cm) in height. The plants flower in March–April. It is a wonderful site to watch

plants in full bloom with robust spikes laden with as many as 29–124 (\bar{X} = 70.90) golden yellow flowers. The deep yellow spikes make a contrast with deep green leaves (Figure 1).

The plants produce abundant pollen (\bar{X} = 70,000 per flower). The colourful flowers are large, aromatic and zygomorphic with bilipped corolla. These floral features constitute the syndrome of entomophily. During field studies, a number of insect visitors were collected from the flowers; chief among these is the bumble bee (*Hymenoptera*). Following their visit to the flower, the bees were found carrying heavy pollen load of the species on various body parts, confirming that they are involved in pollination of *E. superba*. Forced selfing imposed by bagging, did not result in seed set, suggesting that the species is a habitual outbreeder.

The plants produce seeds in nutlets. Seed set, estimated from 8 plants, averages 28% per plant. A good quantity of seed was collected from the plants during the first week of May. Part of the seed has been posted to K. R. Shivanna of Delhi University, who has raised *in vitro* plantlets of the species. In comparison to plants at Domel (Jammu), those at Dehradun are low-seed bearers which could be for a variety of reasons including pollinator limitation and population size as indicated by Rao and Garg¹.

Seeds of *Eremostachys superba* are brown, longer than broad (7 × 3 mm) with a prominent notch at one end. Seed

surface is ridged; the ridges carry prominent, white, distantly placed bristles concentrated on the Chalazal end. The seeds are heavy; 100 seeds weigh 1.055 g. These will be tried for germination during coming winter months.

According to Rao and Garg¹, the species has been endangered by the wanton picking of ornamental spikes, whereby sexual reproduction suffers. While this can pose a threat to the unprotected, defenseless, ornamental herb, our survey team has revealed another stress, which is by far more devastating. The shepherds dig out huge quantities of thick root stock of the perennial ornamental every spring, dry them and store them for use. These are sliced into small pieces, mixed with cattle feed and fed to such cows, buffaloes, and goats, etc., which stop yielding milk. As per information provided by Gujjars and Bakerwals of the area, an average quantity of ½ – 4 kg is fed to a buffalo with 4 or 5 successive meals to restore milching. Exploitation of such a high magnitude, year after year, is apt to squeeze natural population and bring the species to a stage of extinction which Rao and Garg¹ thought it had already reached.

Note added in proof

The authors have discovered three more populations, one each at village Suke-tor, Domel and Khandel, all in district Jammu. The number of individuals in the three populations is around 700.

1. Rao, R. R. and Garg, A., *Curr. Sci.*, 1994, 67, 80–81.
2. Jain, S. K. and Shastri, A. R. K., *The Indian Plant Red Data Book-I*, BSI Publication, 1984, p. 90.
3. Hooker, J. D., *Flora of British India*, William Clowes, London, 1885, vol. IV, p. 695.
4. Sharma, B. M. and Kachroo, P., *Flora of Jammu and Plants of Neighbourhood*, Bishen Singh Mahendra Pal Singh, Dehradun, 1981, vol. 1, p. 264.
5. Chowdhary, H. J. and Wadhwa, B. M., *Flora of Himachal Pradesh*, Botanical Survey of India, Howrah, 1984, vol. 2, p. 567.

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Figure 1. a, Spike of *Eremostachys superba* Royle ex. Benth.; b, Part of a spike in bloom.