Table 1. Major landmarks in *Artemisia annua* research

1984	Introduction of *Artemisia annua* in India.
1989	Development of improved variety 'Asha' of *A. annua*.
1998	CSIR Shield for Process Technology jointly awarded to CIMAP and CDRI for development of the processing technology for α/β-arteether – a new, fast-acting anti-malarial for treatment of complicated and uncomplicated *Plasmodium falciparum* malaria.
1999	Development of artemisinin-rich variety Jeevanraksha and its dedication to the nation on the first National Technology Day (11 May 1999) by the then Prime Minister of India Atal Bihari Vajpayee.
2005	Development of variety CIM-Arogya through marker-assisted breeding.
2005	Launching of CIMAP *Artemisia* Biovillage programme with industrial participation.
2006	Inclusion of *A. annua*-related technology as one of the most important technologies of the year by the then President of India A. P. J. Abdul Kalam in his National Technology Day address to the nation.
2012	CSIR Technology Award–2012 for development and commercialization of anti-malarial drug plant *A. annua* technology package facilitating industrial growth, societal health and rural prosperity.

of CSIR-CIMAP and CSIR-CDRI, farmers and pharma industry, the cost of treatment of cerebral/drug-resistant malaria came down several-fold, thus making treatment of the disease affordable to the poor in Asia and Africa, and saving millions of lives. This drug is presently being exported to several countries, including Nigeria, Ghana, Congo, Kenya, Zambia, Malawi, Rwanda, Myanmar and Cambodia. According to G. P. Dutta (formerly at CSIR-CDRI), nearly 30 pharmaceutical companies in India are producing α,β-arteether (three-dose) injection for meeting indigenous needs as well as for export to African countries. Recognizing the immense value of these contributions, the joint endeavour of CSIR-CIMAP and CSIR-CDRI was duly recognized by the 'CSIR Process Technology Shield' in 1998. Later, CSIR-CIMAP was also awarded the 'CSIR Technology Award–2012' for the development and commercialization of anti-malarial drug plant *A. annua* technology package facilitating industrial growth, societal health and rural prosperity (Table 1).

The immense value of artemisinin to mankind is highlighted by its ability to save millions of lives in Asia and Africa. It is in this context that the researchers at CSIR-CIMAP and CSIR-CDRI feel elated for their role in bringing the benefits of *A. annua* to the service of mankind. The case of artemisinin research also demonstrates the potential of Indian scientists to translate the results of basic research into making a life-saving drug to providing affordable healthcare to the poor. It is hoped that this example would convince our policy planners that Indian scientists have the desired level of concern, commitment and grit for solving the problems of our country. It may not be out of place to underline that the 'proof' of any scientific discovery is more important than its 'concept/principle'. This is why the Nobel Prize to Arthur Kornberg (in 1959) was given away three years ahead of Watson and Crick (in 1962) for proving the functionality of the double-helix model (discovered by Watson and Crick in 1953).

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ANIL KUMAR TRIPATHI[1,*]
MADHU DIKSHIT[2]

[1]*CSIR-Central Institute of Medicinal and Aromatic Plants, Lucknow 226 015, India*
[2]*CSIR-Cenral Drug Research Institute, Lucknow 226 031, India*
**e-mail: director@cimap.res.in*

Disaster victim identification – a need to create zone-wise scientific working groups

More than 8600 lives were lost and 2.8 million people were displaced in a series of earthquakes that rocked Nepal in April–May 2015 (ref. 1). Unfortunately, hundreds of thousands of people are killed in disasters such as floods, cyclones, earthquakes, tsunamis, fires, storms, landslides, airplane crashes, road and train accidents, terrorist attacks, bomb blasts, etc. The year 2014 witnessed several natural disasters throughout the world which were thought-provoking in terms of the number of casualities[2]. For such events, the recovery and identification of the disaster victims is important from humanitarian as well as legal point of view. Disaster victim identification (DVI) is the process of identifying the victims of mass disasters/mass fatality incidents through the application of scientifically proven techniques. The positive identification of the victims of mass fatality incidents is greatly expedited by the advent of modern technologies such as DNA typing, comparison of ante-mortem and post-mortem records using forensic odontological techniques, fingerprints and other anthropological methods. The DVI process can be long and time-consuming as it depends upon the nature of the mass fatality incident. The main aim of the DVI team is to correctly identify human remains; therefore, the team may apply a number of identification methods depending upon the available parts and condition of the deceased and the human remains. The commonly used methods include DNA profiling of the human remains, finger-

print analysis and odontological examination, anatomical and anthropological methods such as identification from the tattoo marks, moles, scars and cuts on the body, deformities in the body and bones through radiographic methods, superimposition methods of identification, and comparison of footwear and other personal articles and objects which the deceased may possess. All these methods may assist in the analysis and identification of the deceased on the basis of comparison of the ante-mortem and post-mortem records available to the team. Sometimes, sophisticated techniques such as reconstruction of the face from the skull may be employed successfully for identification of the deceased.

There is a need for creating a community for disaster science comprising interdisciplinary disaster scientists who can cope with the challenges brought about by both man-made and natural disasters, soften or diminish their impacts, and may also help in improving the policy-making mechanism[3]. Thus, the community for disaster science should include experts from the specialities of forensic pathology, odontology, anthropology, human health, toxic chemistry, geophysics, ecology, atmospheric science, oceanography and the social sciences for a successful disaster management and DVI process. The Scientific Working Group on Disaster Victim Identification (SWGDVI) is a focus group in this regard that was developed by the FBI with the help of the National Institute of Justice (NIJ), USA. There is an urgent need to develop similar focus groups or communities in different regions worldwide for effective DVI management, especially in the developing countries that are prone to disasters and still suffer from poor infrastructure and lack administrative facilities to tackle these issues.

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KEWAL KRISHAN[1,*]
TANUJ KANCHAN[2,*]

[1]*Department of Anthropology, Panjab University, Chandigarh 160 014, India*
[2]*Department of Forensic Medicine and Toxicology, Kasturba Medical College (A Constituent Institute of Manipal University), Mangalore 575 001, India*
**e-mail: kewalkrishan@pu.ac.in; gargkk@yahoo.com*

Some drawbacks of the higher education system in India

Sen[1] has well highlighted the prevailing drawbacks of the present system of Indian higher education. The greed certificates that he has mentioned are evident even in the present times. Scientific workshops that are organized in academic/research institutes attract several participants who show up only for registration on the first day and would either disappear thereafter or 'snooze' through elaborate power-point presentations. The usual reaction at the end would be, 'I was just sitting there, I did not understand anything'. However, the same person who would comment as such, would deliver a delightful feedback in the valedictory session to please the audience. The main problem behind this is the fact that many experts lack the skill of attracting the interest of participants in such workshops. They continue presenting their knowledge through monotonous lectures which only 'kill' the interest of the participants. Hence, the few who participate with genuine interest are also disappointed. The same is evident in national/international seminars where participants would throng the registration desk on the first day but would eventually leave after their presentation is over, with participation/presentation certificates. This is well indicated by the gradually decreasing size of the audience during such occasions. Under such circumstances, these workshops and seminars remain mere clichés. This results into the wastage of funds that are pumped into organizing such events, except the certificates which are displayed during job interviews. These funds could be effectively used in upgrading research infrastructure in the country.

The inability of generating interest is also evident during usual classroom lectures in higher educational institutes and hence students end up sitting in their departments only for the sake of attendance. The result is the lack of curiosity mentioned by Sen[1]. However, we contradict his opinion that curiosity generation should be fostered from the school level. At this level, stress should be laid upon exposing students to preliminary science. Sen[1] seems to undermine the role of bookish knowledge during such stages. This is, however, a primary tool for acquainting students with different scientific areas, thereby laying the foundation of science. It is only after exposure to the theoretical knowledge from textbooks that children would be able to assimilate knowledge from research papers. Moreover, school teachers are not experienced researchers.

The fostering of scientific curiosity is the responsibility of university faculty who are actively involved in research. This cannot be expected of school teachers who are never actively involved in scientific research. In fact, rather than curiosity as mentioned by Sen[1], emphasis should be laid upon training students on the formulation of problems and finding out possible ways of solving them. Knowing a problem is not the aim of research, but solving is. Hence, along with generating interest, stress should be laid on developing analytical and reporting skills of students so that they could properly identify a problem, formulate it and then devise the means to solve it as well as report it. It would only be under such circumstances that research scholars would not be victims of mechanical research where everything is imposed upon and dictated by the supervisors, which according to Sen[1] is a problem.

We also contradict Sen's[1] views on making single-author publications mandatory for pursuing research. For