

Minutes of the 2nd Sub-Committee meeting of the Genetic Engineering Appraisal Committee (GEAC) held on 11.04.2016

The Sub-Committee meeting of the GEAC was held on 11th April, 2016 in the Ministry of Environment, Forest and Climate Change (MoEF&CC) at Narmada Conference Hall, Jal Wing from 11:00 am under the Chairmanship of Dr. K. Veluthambi (co-chair of the GEAC). The list of participants is annexed at Annexure - I. Leave of absence was granted to Dr. B. Sesikeran as requested by him.

2. At the outset the Chairman welcomed all members of the Sub-Committee and Dr. Ranjini Warriar (Advisor) welcomed the members of the Sub-Committee on behalf of the Ministry and informed the Sub-Committee members about the Central Information Commission (CIC) judgement regarding making data on GM Mustard Public by April 30, 2016. Dr. S. R. Rao briefed the Sub-Committee members on the follow up actions taken by Biosafety Support Unit (BSU) pursuant to the 128th GEAC meeting held on 04.03.2016 regarding the application for environmental release of transgenic mustard (*Brassica juncea*) hybrid DMH-11 by the Department of Genetics, Centre for Genetic Manipulation of Crop Plants (CGMCP), University of Delhi (South Campus).

3. Discussion on the Sub-Committee report on the application for environmental release of transgenic mustard (*Brassica juncea*) hybrid DMH-11 by the Department of Genetics, Centre for Genetic Manipulation of Crop Plants (CGMCP), University of Delhi (South Campus)

The GEAC in its 128th meeting held on 4th March, 2016 had sought further information/clarifications from CGMCP and accordingly a revised document was submitted by the Applicant. It was informed that pursuant to receiving the revised dossier from the Applicant, the revised biosafety dossier and draft RARM report of the Sub-Committee was circulated among the Sub-Committee members. Comments of the experts were tabulated along with the remarks of the BSU and circulated in the 2nd Sub-Committee meeting. After a brief discussion, the following points were raised by the members of the Sub-Committee:

Dr. K. Veluthambi & Dr Ramesh Sonti:

Northern or RT PCR analysis may be done to show whether a transcript corresponding to the two potential ORF's is made from the spacer region in Varuna *barnase* plants. The transcript analysis may be done in vegetative tissues.

Dr. S. K. Apte:

i. In the RARM document where ever Statistical data are given, standard deviation should be added to determine statistical significance. For example, in IMTECH Data on soil microbes it is useful to have details of data with variations to show significance of the differences. Information on sample size should be included.

ii. Effect on beneficial soil microorganisms (As per the 1989 Guidelines of RCGM document) may be evaluated as a part of Post Release Monitoring.

iii. As part of sustainable use of deregulated GE mustard in future, it is important to demonstrate that honey derived from GE mustard be tested for the absence of *barnase* for a definite period as a part of Post Release Monitoring.

Prof. C. R Babu Comments:

Prof Babu explained that Self Reproducible Populations' of *Brassica juncea* may get established in the hills (not in the plains) and though probability of such occurrence may be low, this question needs to be addressed. The Committee opined that this should be taken as a scientific question which should be addressed from a research angle in the interest of long term sustainability of GM Mustard technology. He also pointed out the chances of crossability between *Brassica juncea* and wild germplasm of Mustard in the hills and in this regard the members requested him to provide publications on this subject.

Dr.K.V. Prabhu

Dr Prabhu made comments particularly on probability of crossing between *Brassica juncea* and wild relatives if any reported and found in the foothills or hilly regions in the north and north eastern hills. Gene flow in the post-gene flow consequence as potentially possible outcomes is near to nil, since the wild relatives are all mono-genomic species and *Brassica juncea* belongs to AABB. The hybrids formed between the wild species and *B. juncea* will not be able to produce any seeds and will remain sterile making the gene flow ineffective. Further, the target low frequency of any such survival of such a gene transfer shall have no risk in general since it will be similar to natural process of evolution. Cross pollinate with *Brassica* Transgenic mustard DMH-11 is highly unlikely to cross pollinate with *Brassica* related species and wild and weedy relatives. Cross pollination requires close proximity. Even if out crossing occurs, the progeny of such crosses will not have any survival advantages. He was therefore of the view that there is no need to prescribe any post release management.

Dr. S. K. Apte:

- i. In the RARM document where ever Statistical data are given, standard deviation should be added to determine statistical significance. For example, in IMTECH Data on soil microbes it is useful to have details of data with variations to show significance of the differences. Information on sample size should be included.
- ii. Effect on beneficial soil microorganisms (As per the 1989 Guidelines of RCGM document) may be evaluated as a part of Post Release Monitoring.
- iii. As part of sustainable use of deregulated GE mustard in future, it is important to demonstrate that honey derived from GE mustard be tested for the absence of *barnase* for a definite period as a part of Post Release Monitoring.

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Dr.S.R.Rao

Dr Rao suggested that the title on the cover page of the RARM document may be changed to "Assessment of Food/Feed and Environmental Safety (AFES)". The change was agreed by the members. On impact of microbial diversity, Dr Rao pointed out that the proteins expressed by the GE mustard are expected to be widely present in nature and their presence in the GE mustard is not expected to present any new toxicity risks to soil microorganisms in these environments. In addition, the introduced proteins are expressed at very low levels as intracellular proteins and not found in the root exudates of GE mustard. Further all the available evidence suggests that GE mustard is expected to exert an equivalent effect on rhizospheric microbial population similar to non-transgenic conventional parents and local checks. However, the effect on beneficial soil microorganisms (As per the 1989 Guidelines of RCGM document) envisaged shall be evaluated to examine the need for Post Releasing Monitoring before finalising the RARM document.

Recommendations of the Sub-committee:

The Sub-Committee recommended that the comments of the Experts on the RARM document and remarks given by the BSU be appropriately incorporated in the report of the Sub-Committee (RARM document) and submitted for consideration in the upcoming GEAC Meeting and also uploaded on the GEAC website.

Annexure-I**List of Participants in the 2nd Sub-Committee meeting of the GEAC held on 11.04.2016**

1	Dr. K. Veluthambi Professor, Co-Chairman (Retd) & Head, School of Biotechnology, Madurai Kamraj University, Madurai & Co-Chairman, GEAC	Chairman
2	Dr. Ranjini Warriar Advisor, MoEF&CC	Member
3	Prof. C.R. Babu Centre for Environmental Management of Degraded Ecosystems, School of Environmental Studies, DU, New Delhi	Member
4	Dr. S. R. Rao Advisor, Department of Biotechnology, CGO Complex, New Delhi	Member
5	Dr. S. K. Apte Director, Bio-Medical Group, BARC Mumbai	Member
6	Dr. Ramesh Sonti Chief Scientist, CSIR, Centre for Cellular & Molecular Biology (CSI-CCMB) Uppal Road Hyderabad	Member
7	Dr. K V Prabhu Joint Director, IARI, Pusa New Delhi	Member
8	Ms. Madhumita Biswas Director, MoEF&CC	Member Secretary