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# **Biodiversity**

## **NORTH EAST INDIA PERSPECTIVES**

Proceedings of the Workshop on Peoples' Participation in  
Biodiversity Conservation

4 – 6 March 1999

Organized by

North Eastern Biodiversity Research Cell,  
North Eastern Hill University, Shillong 793 003

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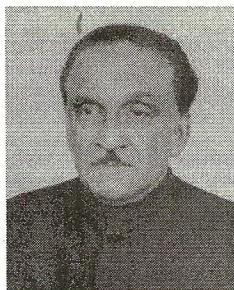
Synjuk Seng Samla Shnong, Shillong

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March 07, 1999

## MESSAGE

It gives me great pleasure to learn that the North-Eastern Biodiversity Research Cell (NEHU) is publishing the proceedings of the recent workshop on "Peoples' Participation in Biodiversity Conservation" held in Shillong.

The north-eastern region is very rich in natural resources. It is globally recognized as a megabiodiversity area as it is one of the richest reservoirs of genetic diversity of plants, animals and microbes. The biodiversity of the region is under serious threat due to wanton felling of forest trees for shifting cultivation and to meet the demand for timber and fuel wood, urbanization, construction of roads, bridges and dams and other forms of exploitation of biological and mineral resources. This raises serious issues of sustainability of use, environmental degradation and stress on biological resources.

I think peoples' active participation can go a long way in conserving our rich biodiversity - for a better tomorrow. People must realise that life on earth will perish if they do not take pragmatic steps in order to save biodiversity.

I hope the efforts of the North-Eastern Biodiversity Research Cell (NEHU) and the Synjuk Seng Samla Shnong (SSSS) will be replicated by others to ensure peoples' involvement in the conservation movement.

A handwritten signature in dark ink, appearing to read "M.M. Jacob".

(M.M. Jacob)  
Governor of Meghalaya.



# ARUNACHAL UNIVERSITY

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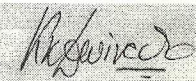
Arunachal Pradesh

Dr. K. K. DWIVEDI  
VICE-CHANCELLOR

## MESSAGE

I have noted with great satisfaction that the North-Eastern Biodiversity Research Cell at NEHU Shillong has very successfully organized a three day workshop on "Peoples participation in Biodiversity Conservation" in March this year. A large number of distinguished participants have gathered and exchanged their views on various aspects of biodiversity conservation and sustainable development in NE region. I have been informed that the deliberations in the workshop were extremely useful and the major contributions and findings are now being published in the form of a proceeding. I am very sure that such effort will bring out valuable reference material for scientists, environmentalists and planners.

I congratulate the scientists and organizers of NEBRC for bringing out the workshop's proceedings and hope that with their untiring efforts the objectives of the cell will be successfully achieved.

  
(K.K. DWIVEDI)

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# Acknowledgements

I consider it my privilege to thank all those who were instrumental in making this workshop a fruitful one and furthermore, on behalf of the NEBRC, I take this opportunity to briefly outline the genesis of this project and give due acknowledgement to those who were instrumental in the establishment of the Cell.

This project funded by the North East Council, Planning Commission, New Delhi was a direct outcome of the Govt. of India recognition of the much-needed thrust on Biodiversity, in line with the global environment conservation scenario. The establishment of the North Eastern Biodiversity Research Cell is a consequence of their intent to promote sustainable development by way of encouraging more Research and Development centres, keeping in view biodiversity conservation concerns. Given the constraints and lack of infrastructure in research and development, the North East needs to be viewed through perspective. Developmental priorities per se should be categorised/identified in consonance with the available resources. Needless to say that with its rich Biodiversity resources, serious attention must be given towards in-depth study of these resources so that they may be used in a sustainable manner to explore, expand, tap and regulate these bio-resources in a sustainable manner.

In this context, the then Secretary of the North Eastern Council, Mr. H. A. D. Sawian, IAS, the present Secretary, Mr. T. Ringu, IAS, Mr. J. M. Syiem, IAS, Planning Adviser, Mr. G. Sen, Financial Adviser and their executives, deserve special mention for facilitating and making this project functional. The NEBRC would also like to particularly acknowledge Mr. Promode Kant, IFS, Chief Conservator of Forests, MoEF and Adviser (E & F) to the NEC, Mr. W. Suting, IFS, Conservator of Forests, MoEF and Dr. V. T. Darlong, Joint Director, MoEF who continually enrich us with their vast experience which will go a long way towards achieving our goals.

We extend our appreciation and gratefulness to the North Eastern Hill University, in particular, the Vice-chancellor, Prof. B. Pakem, for providing us the much-needed support, advice and the various facilities. The Head, Department of Chemistry, Prof. M. K. Mohanty and his colleagues, deserve special thanks for all the support and encouragement. It would be incomplete not to mention Prof. M. S. Swaminathan, Chairman, MSS Research Foundation, Chennai and Prof. T. N. Ananthakrishnan, Director, ERI, Chennai for their support and valuable suggestions in the formative stage of this Project.

To be able to achieve sustainable growth, it is imperative that people at the grassroots level be involved. It is with this view that the NEBRC in its maiden venture organized this workshop jointly with a premiere youth organization of the State. This joint undertaking was done with the view that an approach of this kind will provide a better interface between public and the intellectuals. In this context, I am indeed very grateful to the executive members of the Synjuk Seng Samla Shnong (SSSS), Shillong for their willingness to participate not only in this workshop but also in all our public activities related to Biodiversity awareness. In retrospect, it is due to their involvement that we have been able to reach out, and accepted by a larger grassroots audience within such a short time-span.

I take this opportunity to thank and express my gratitude to all our resource persons from the entire North Eastern States including the different Non-Government Organizations (NGOs), who, through their participation has provided us with a much more broader perspective as well as a more meaningful outlook towards biodiversity. Their contribution to this workshop by way of paper presentations, interactions and discussions will go a long way to provide a Regional focus on Biodiversity concerns.

I am indeed grateful to all the members of various committees, in particular Dr B. S. Khongwir, D.G. Nongkhlaw, C. Syngai, Gordon Tham, Linus Marwein, Larry Warjri, Khraw Kharlukhi, Paul Shanpru, Bull. N, Dr. M. B. syiem, Adamson Khonglam and Jemino Mawthoh, Chairman SSSS for their untiring support and effort throughout the entire workshop proceedings.

I thank the press and the media, in particular, Mr. Sanat Chakraborty and Ms. Linda Chhakchhuak for their enthusiastic participation besides the wide coverage throughout the duration of the Workshop. My appreciation for our own JRFs, Y. S. H. Yobin, I. Thamar, D. Marngar, B. Das, R. Lalfakzuala, Lalmangaihzuala, G. Syngai, R. Nongrum and R. Nongkhlaw and for our own personnel, Mr. Edwin Nongrum, M. Warr and M. Lyngdoh for their cooperation and especially to Ms. M. Kharmudai, Ms. D. Suiam and Mr. D. R. M Buam for all the tedious typing and compilation of the manuscripts.

I take this opportunity on behalf of the Cell, to duly acknowledge and express our special appreciation to Mr. P.R. Mawthoh retired Director, Soil, and ex-Advisor NEC, Chairman, Synjuk Rambah Shnong and ex-Coordinator Total Literacy Campaign for his ever willing service, effort, advice, support and enthusiasm right from the very initial stages of writing of this project. His advice will go a long way beyond this project to continually inspire us.

I am grateful to all the agencies/departments who have willingly supported this workshop by way of advertisements. I also would like to acknowledge M/S WATERS INDIA LTD. and M/S MILLIPORE INDIA LTD. for their sponsorships of dinners during the workshop.

The resolution adopted in conclusion stems directly from the interaction between all the participants in a special session meant primarily for the purpose. It expresses and reflects the views and concerns *vis-à-vis* Biodiversity Conservation issues in the North East. We sincerely hope that the resolution adopted will provide a better insight and serve as a reference document for other Agencies/Departments to act, and if necessary, legislate upon.

July 1999

**D. Syiem**  
Organizing Secretary

As an effort to contribute towards Biodiversity Study, Use and Conservation, the North Eastern Biodiversity Research Cell (NEBRC) in collaboration with the Synjuk Seng Samla Shnong, Shillong (SSSS), a federation of youth organizations, had organized a workshop on *Peoples' Participation in Biodiversity Conservation* from 4<sup>th</sup> to 6<sup>th</sup> March 1999. The workshop aimed to bring people to a single platform to discuss issues pertaining to utilization of natural resources/wealth of the North Eastern region. Participants from all walks of life, which included eminent Foresters, Scientists, Researchers, Herbal Medicine Practitioners, NGOs, Community Workers etc. had deliberated on various issues related to the theme. This compilation of the proceedings is an outcome of the selected papers contributed by these persons. Minor editorial alterations have been made where necessary to maintain conformity and style without changing the subject matter. The papers compiled here cover a variety of subjects, from Peoples' Experience, Indigenous Knowledge Systems, Species Diversity, Use of Medicinal Plants and Threats to Biodiversity. The resolutions emerging from the NGOs' discussion held before conclusion of the workshop have also been included in this compilation. The recommendations arising from the Workshop will be disseminated to policy makers and lawmakers of all the North Eastern States.

It is sincerely hoped that this compilation would provide a vast array of information and development alternatives to various communities and also enlighten them about the need to Conserve, Study and Use Biodiversity resources effectively.

July 1999

B. Kharbuli  
Convener

## ANTI-TUMOUR ACTIVITY OF CRUDE EXTRACT OF *Potentilla fulgens*

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### Introduction

The herb *Potentilla fulgens* is quite common in the higher altitudes of Meghalaya and is commonly known as *Langning*, *Lynniang* or *Langsniang*. This plant is commonly used by the local practitioners as a remedy for various types of ailments. The local folk usually chew the root of this plant along with 'kwai' or 'paan'. It has been observed that those who chew the root of this plant along with 'kwai' seldom develop cancer. It is this fact which made the NEBRC decide to start preliminary studies on the Anti-tumor activity of this plant.

### Methodology

Roots of *Potentilla fulgens* were shredded and sun-dried for two days and kept in methanol for one week. The crude methanolic extract was filtered and the filtrate is evaporated in steam bath. The extract is then dried and made ready for use. The powder of this extract is dissolved in 20% ethanol, which is used for experimental treatment in laboratory mice.

The anti-tumor activity of this extract *in-vivo* towards any tumor in mice was determined in accordance with the U.S National Cancer Institute Standard Protocols for primary screening. The evaluation of this activity was established by computing the Treated/Control (T/C) value, that is, the median survival time of treated group of animals (T) divided by that of the control group (C). T/C value is expressed in percentage. A compound is considered active if it has a T/C value of >120%.

### Protocol

The intra-peritoneal injection of crude methanolic extract of *Potentilla fulgens* were done on both sexes of laboratory mice (6-8 weeks old) transplanted with tumor cells. Approximately, a million cells (Dalton's lymphoma) were inoculated intra-peritoneally on laboratory mice. Without treatment with the plant extract, the survival time of these mice were about 13 days. The same numbers of tumor cells were transplanted intra-peritoneally on mice and then 20mg /Kg of the methanol extract of the plant dissolved in distilled water was injected to these mice on day 1, 5 and 9 (The day the mice is transplanted with tumour cells is 'day 0'). It was found that the survival time of these mice were only about 14 days. Again when the dose of the extract dissolved in 20% ethanol is increased to 100 mg/Kg body weight, then the survival time is only 15 days. Similarly, transplanted mice were treated with 250 mg and 500 mg/ Kg body weight of the extract. It was observed that at a dose of 500 mg /Kg body weight the survival time is only 4 days which indicates that at a higher dose the extract appears to be toxic. At a dose of 250 mg/Kg the survival time rises up to 23 days (Table - I)

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## Results

The intra-peritoneal injection of crude methanolic extract of *Potentilla fulgens* shows that the T/C value expressed as % is 176 at a dosage of 250mg/kg body weight. This indicates that the extract has the potential for anti-tumour activity.

**Table – I: The effect of different doses of the crude extracts of *Potentilla fulgens* on mice inoculated with tumor cells (Dalton's lymphoma).**

Sl no.	No. of cells transplanted	Solvent	Mice		Dose/inj/ kg b.wt.	Days of treatment	Survival time (days)	Median	T/C value
			b. wt.	Sex					
1.	1x10 <sup>6</sup> (approx.)	--	30	male	--	--	13	13	176% at 250mg/Kg/inj/b.wt.
			30	female					
2.	-do-	ddw	25	male	20mg	1, 5, 9	14	23	
3.	-do-	-do-	25	female	-do-	-do-	15		
4.	-do-	20% ethanol	25	male	100mg	1, 3, 6, 9	15		
5.	-do-	-do-	30	female	-do-	-do-	17		
6.	-do-	-do-	25	female	-do-	-do-	23		
7.	-do-	-do-	25	male	250mg	1, 3, 5, 7	26		
8.	-do-	-do-	25	male	-do-	-do-	22		
9.	-do-	-do-	30	male	500mg	1, 3	4		

**Abbreviations:** ddw- double distilled water;

b.wt.- body weight;

inj- injection;

T/C- Treated/Control

## Conclusion

The results of the experiment conducted on laboratory mice injected intra-peritoneally by the crude methanolic extract of *Potentilla fulgens* indicates that at a dose of 100mg/kg body weight, the plant extract did not show much activity. At a dose of 250mg/kg body weight prolonged the survival time of the mice which indicates that the extract has reduced the tumor growth. While at a dose of 500mg/kg body weight the extract had lethal effect on mice. This work is being carried out in collaboration with the teachers and JRFs of the NEBRC team. Further investigation is going on to confirm the results with the active principles to be isolated from the plant.