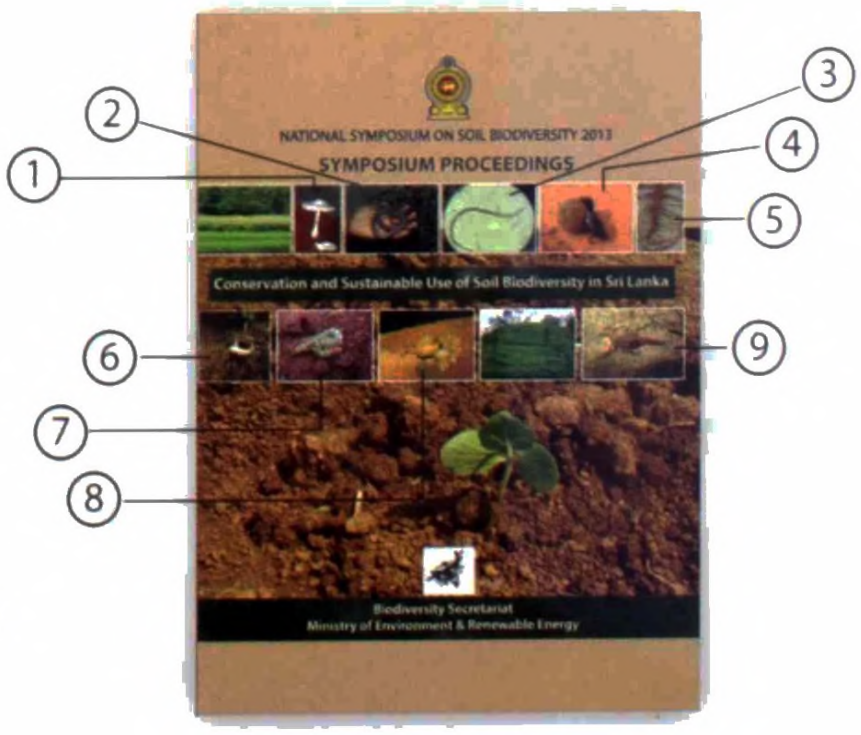
1. Agaricus (SG)
2. Giant earth worm (TK)
3. Soil inhabiting Nematoda (web)
4. Dung beetles (SG)
5. Root nodules (web)
6. Burrow of ground dwelling spider (TK)
7. Centipede (SG)
8. *Euplecta semidecussata* (SG)
9. Endemic Scorpion (*Lychas srilankensis*) (SG)



NATIONAL SYMPOSIUM ON SOIL BIODIVERSITY 2013

Symposium Proceedings

"Conservation and Sustainable Use of Soil Biodiversity in Sri Lanka"

10th & 11th December 2013

Sri Lanka Institute of Development Administration (SLIDA)

Colombo 07

BDS

Organized by

Biodiversity Secretariat (BDS)

Ministry of Environment & Renewable Energy

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Message from the Hon. Minister of Environment and Renewable Energy

Sri Lanka's biodiversity is significantly important both in a regional and global scale with the country designated as a one of 34 biodiversity hotspots in the world. Sri Lanka's high biodiversity includes a diverse array of ecosystems and species that provide a wide range of ecosystem services.

According to the 1978 Constitution of the Democratic Socialist Republic of Sri Lanka, it is the duty of the State and every person in Sri Lanka to protect, preserve and improve the environment for the benefit of the community. The Ministry of Environment has taken the responsibility of implementing the constitution by making development more sustainable.

Biodiversity conservation is not a new phenomenon to Sri Lanka. From ancient times Sri Lankans have had close relations with flora and fauna and were very much concerned about their conservation and protection for the benefit of future generations. Sri Lanka has adopted a positive approach in formulating new policies and strategies towards conserving its biological wealth. We have signed and ratified the Convention on Biological Diversity (CBD) and are already in the process of implementing relevant provisions. Further, Sri Lanka is one of the very first countries that prepared a Biodiversity Conservation Strategy and Action Plan.

Human societies rely on the vast diversity of benefits provided by nature, such as food, fibers, construction materials, clean water, clean air and climate regulation. Land soil degradation, land use management, climate change, chemical pollution, genetically modified organisms (GMOs) and invasive species have been identified as current threats to biodiversity.

The *Mahinda Chintana* – Vision for the Future, gives the highest priority to all aspects of environmental protection, caring for nature in the move towards sustainable development in all aspects of social and economic progress. It has clearly mentioned that "the development of natural resources and environment would be in line with sustainable development principles which avoid costly remediation measures".

As the national manifesto, *Mahinda Chinthana*-Vision for the Future, identified forest, wildlife and biodiversity, mineral and land resources as key areas of environment section. It has included biodiversity, soil and water conservation programmes and policy and legislation as priority programmes and areas. Among the identified issues in *Mahinda Chinthana*, lack of understanding of scientific management, undervaluation of biodiversity and absence of inter-institutional coordination with regulation to biodiversity have been clearly stated. Improved land preparation and efficient irrigation and plant nutrient management practices have to be put into effect. With finding sustainable mechanisms to the utilization component of soil biodiversity, it is of paramount importance to take necessary measures for the conservation of soil biodiversity in Sri Lanka.

I hope this document will be taken as an important tool in future development activities, in Sri Lanka becoming the immerging Wonder of Asia in a sustainable manner while conserving soil biodiversity of the country for the generations to come.

As the national focal point for the CBD, my Ministry fervently hopes that this endeavor will bring about the forum and knowledge dissemination for the conservation and sustainable use of soil biodiversity in Sri Lanka.

Susil Premajayantha
Hon. Minister of Environment and Renewable Energy

Message from the Secretary of Environment and Renewable Energy

Sri Lanka has a rich diversity of flora and fauna, owing to the varied climate, topography and soils. The high diversity of ecosystems has provided habitats for rich species diversity, and edaphic and climatic variants of individual species.

As the policy makers of the country it is very important to identify and prioritize the species for conservation activities. The Convention on Biological Diversity (CBD) is a welcome move to arrest the erosion of biodiversity world-wide. Indeed, Sri Lanka, being proactive to the needs, was one of the early countries to ratify the CBD in 1994.

As steps in implementing the CBD, Sri Lanka has prepared a framework for action for the conservation of biodiversity (BCAP) and subsequent addendums to the framework. With achieving mandates of the CBD and fulfilment of the recommendations of the BCAP, updated information on soil biodiversity will be originated and disseminated among responsible institutions and stakeholders in this subject.

The objective of this publication is to review the state of knowledge of soil biodiversity, its functions, contribution to ecosystem services and relevance for the sustainability of human society. The ecosystem services provided by soil biota are driving nutrient cycling and regulation of water flow, soil sediment movement and biological regulation, maintenance and detoxification of pollutants and regulation of atmospheric composition.

Haritha Lanka Programme, the national action plan prepared for implementation of environment strategies and activities of *Mahinda Chinthana*, has also identified saving flora, fauna and ecosystems under its missions.

One of the basic problems is lack of adequate scientific information. More research is needed to estimate the impacts on soil organisms and functions. Individual studies focused on local soil ecosystems will be indispensable to develop a comprehensive view and to measure the effects on soil biodiversity appropriately.

The approach of this symposium to disseminate the knowledge and experience in soil biodiversity conservation, prepare a data base on soil biodiversity and promote research in much needed areas.

Considering the field of soil biodiversity and conservation, it is rare to find a specific awareness creation programme and identify work related to the area at national level. It is of utmost importance that we bring various experts and researchers of the soil biodiversity and policy makers to be present in a forum to identify and make aware of various aspects of sustainable use of soil biodiversity and conservation. National symposium on Soil Biodiversity is expected to set the act in that direction.

This important symposium will focus in creating outputs for promoting research on subjects relevant to the soil biodiversity, establishing and maintaining an adequate data base and knowledge dissemination by making available subject information for use by stakeholders, researchers, education sector personnel and other interested people.

I wish to thank all who contributed for the preparation of this publication.

B. M. U. D. Basnayake
Secretary, Ministry of Environment and Renewable Energy

Message from the Director, Biodiversity Secretariat

Soil is an essential part of the terrestrial ecosystem. It is a critical resource not only to agricultural production and food security but also to the maintenance of most life processes. Soil biodiversity reflects the variability among living organisms ranging from micro-organisms and larger meso-fauna, as well as the more familiar macro-fauna. Plant roots can also be considered as soil organisms in view of their symbiotic relationships and interactions with other soil components. Environmental factors such as temperature, moisture and acidity and climate change scenarios, as well as anthropogenic actions, in particular, agricultural and forestry management practices affect, to different extents, the soil biodiversity.

Considering the above importance of the soil, Convention on Biological Diversity (CBD) has identified conservation and sustainable use of soil biodiversity as an area requiring particular attention under the several work programmes. Mainly, it has been identified under the agricultural biodiversity of the Conference of the Parties (COP) to the CBD. The COP at its 6th meeting in Hague, Netherlands April 2002 (COP decision VI/5, paragraph 13) decided "to establish an International Initiative for the Conservation and Sustainable Use of Soil Biodiversity as a cross-cutting initiative within the programme of work on agricultural biodiversity, and invites its' all parties, and other relevant organizations, to facilitate and coordinate this initiative". Taking this in to account as the national focal point to the CBD, Biodiversity Secretariat (BDS) of the Ministry of Environment and Renewable Energy (MoE&RE) well recognized the need to conserve and sustainably use soil biodiversity and decided to set priorities for national level needs to integrate soil biodiversity conservation into our national strategies & action plans and put in place multisectoral programmes.

In this context, we organized the "National Symposium on Soil Biodiversity" as the first national symposium regarding conservation and sustainable utilization of soil biodiversity in Sri Lanka. Assessing present status of soil biodiversity in Sri Lanka, identifying gaps in areas of awareness, information, researches, policies and conservation, collecting necessary information to develop a research data base as sources to develop a plan of action for conservation & sustainable use of soil organisms, and establishing a national network among scientists who work on soil organisms and policy makers who are involving on soil biodiversity are the priority expectations of this symposium. All presentations of the symposium is included in this document and It will provide valuable information to the scientists, academics, policy makers and other interested parties in understanding various aspects of Soil Biodiversity in Sri Lanka.

It is our fervent hope that this publication will provide practical information to all those who are proactively taking part in the country's efforts to conserve the Soil Biodiversity and its components. I take this opportunity to thank all who have contributed for the success of this symposium and publication. I wish the symposium all success.

R. H. M. P. Abeykoon
Director, Biodiversity Secretariat
Ministry of Environment and Renewable Energy.

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Programme of the Symposium

The 1st National Symposium on Soil Biodiversity 2013
10th -11th December 2013
Sri Lanka Institute of Development Administration (SLIDA), Colombo 07.

Inauguration on 10th December 2013

8.30 am- 9.00 am	Registration of Participants
9.00 am- 9.10 am	Lighting of the Traditional Oil Lamp National Anthem
9.10 am- 9.25 am	Welcomes address and objectives of the programme by **Mr. B. M. U. D. Basnayake,** Secretary, Ministry of Environment and Renewable Energy.
9.25 am- 9.30 am	Presenting book on "Proceedings of National Symposium on Soil Biodiversity-2013" to Hon. Minister by **Mr. B. M. U. D. Basnayake,** Secretary, Ministry of Environment and Renewable Energy.
9.35 am- 9.55 am	Keynote Address: **"Soils of Sri Lanka and Biodiversity" Dr. W. M. D. B. Wickramasinghe,** Director, Natural Resource Management Centre (NRMC), Peradeniya.
9.55 am- 10.10 am	Address by the Chief Guest, **Hon. Susil Premajayantha,** Minister of Environment & Renewable Energy.
10.10 am- 10.40 am	Guest Speech: **"Soil Microbial Diversity and Its Use In Crop Production" Prof. S. A. Kulasooriya,** Visiting Research Professor, Institute of Fundamental Studies (IFS), Kandy.
10.40 am- 10.50 am	Vote of Thanks, **Mrs. R. H. M. P. Abeykoon,** Director, Biodiversity Secretariat, Ministry of Environment and Renewable Energy.
10.50 am- 11.15 am	Refreshments
11.20 am	Commencement of Technical Sessions

SCHEDULE OF THE TECHNICAL SESSIONS
1st National Symposium on Soil Biodiversity -2013
Biodiversity Secretariat-Ministry of Environment & Renewable Energy
10th-11th December 2013 at Sri Lanka Institute of Development Administration (SLIDA)

Day 01: 10th December 2013

Session Theme 01: Present Status on Soil Species Diversity-Part A **Chaired by Prof. S. Widanapathirana**		
Time	**Paper Number**	**Title**
11.25 am	**1-01**	**Keynote speech: "Soil Biodiversity and Ecosystem Services"** Devaka Weerakoon
11.40 am	**1-02**	**"Information on Soil-inhabiting Nematodes in Sri Lanka"** Dammini Premachandra
11.55 am	**1-03**	**"Soil Preferences of Tiger Beetles (Coleoptera, Cicindelidae) of Sri Lanka"** Chandima Dangalle, Nirmalie Pallewatta & Nimal K. Dangalle
12.10 pm	**1-04**	**"Ground Dwelling Ants of Sri Lanka"** R. K. Sriyani Dias
12.25 pm	**1-05**	**"Present Status of Annelida: Oligochaeta (Earthworms) Diversity in Sri Lanka"** Janaka W. K. Samaran[illegible]ke
12.40 pm	**1-06**	**Present Status on Termites Diversity in Sri Lanka"** N. C. Kumarasinghe
12.55 pm	**1-07**	**"Studies on Soil Macro Fauna in Jaffna, Sri Lanka – Present Status and Future Plans "** R. Gnaneswaran
12.55 pm-1.15 pm	**Panel Discussion**	
1.20 pm- 2.20 pm	**Lunch Break**	
Session Theme 01: Present Status on Soil Species Diversity-Part B **Chaired by Prof. Devaka Weerakoon**		
2.25 pm	**1-08**	**Invited Address: "Nematode Parasites and their Naturally Occurring Bio Control Agents in Tea Soils of Sri Lanka"** K. M. Mohotti
2.40 pm	**1-09**	**Invited Speech: "*Status quo*: A Sri Lankan Perspective of Soil Biodiversity"** S. Somaratne
2.55 pm	**1-10**	**"Present Status on Land Snail Diversity in Sri Lanka"** K. B. Ranawana & Ironie Nagasena
3.10 pm	**1-11**	**"Some Notes on Ground Dwelling Mygalomorph (Araneae) Spiders of Sri Lanka"** Ranil P. Nanayakkara & Nilantha Vishvanath
3.25 pm	**1-12**	**"Distribution of Three Scorpion Species (Scorpiones: Arachnida) in Jaffna Peninsula"** Thampoe Eswaramohan, K. Veronika & A. Murugananthan
3.40 pm	**1-13**	**"Diversity and Species Composition of Earthworms in Kalutara District of Sri Lanka"** M. W. D. Wickramaratne & S. R. Krishnarajah
3.55 pm-4.15 pm	**Panel Discussion**	
4.15 pm- 4.30pm	**End of the 1st day sessions & Tea**	

Day 02: 11th December 2013

Session Theme 02: Distribution of Soil biodiversity among Different Ecosystems/Habitats in Sri Lanka Chaired by Dr. N. Pallewatta		
Time	**Paper Number**	**Title**
8.45 am	2-01	**" Potentail use of Bacterial Communities as Indicators of Soil Quality in Selective Ecosystems of Sri Lanka "** R. M. Chandi Rajapakse
9.00 am	2-02	**"Soil Biodiversity of Natural Grasslands in Sri Lanka; A General Review"** G. G. C. Premalal & G. A. D. Perera
9.15 am	2-03	**" Isolation, Identification & Characterization of Microorganisms from Selected Hot Springs of Sri Lanka "** Sabriya Ashrof & S. C. Wijayaratne
9.30 am	2-04	**"Macrobenthic Composition and Diversity in Unawatuna, Ahangama and Madiha, Southern Coast of Sri Lanka"** K. H. Hashan Niroshana & P. B. Terney Pradeep Kumara
9.45 am	2-05	**"Plant Growth Promoting Bacteria in the Root Environment of Selected Rice Varieties Grown in Sri Lanka"** Warshi S. Dandeniya & R. M. C. P. Rajapaksha
10.00 am-10.15 am	Panel Discussion	
10.20 am-10.45 am	Tea Break	
Session Theme 03: Applications/ Importance of Soil Organisms **Chaired by Prof. S. A. Kulasooriya**		
10.45 am	3-01	**Invited Speech: "Soil Microbial Diversity for Bio Prospecting"** S. C. Wijayaratne
11.00 am	3-02	**"Prospects in Exploring and Promoting Potential Soil Organisms Towards Organic Agriculture and to Preserve Soil Biodiversity in Northern Province of Sri Lanka"** G. Mikunthan
11.15 am	3-03	**"Enhanced Soil Biodiversity in Organic and Biodynamic Tea Cultivation Systems In Comparison To Conventional System"** A. J. Mohotti & K. M. Mohotti
11.30 am	3-04	**"Relationship Between Grain Yield and Soil Bacterial Population as Influenced by Soil Organic Matter content in Rain-Fed Rice"** D. P. P. Jayakody, W. K. Hirimburegama & D. S. De Z. Abeysiriwardena
11.45 am	3-05	**"Evaluating the Ability of Rice to Effectively Suppress the Activity of Soil Nitrifiers"** Warshi S. Dandeniya
12.00 am	3-06	**"Soil Biodiversity Loss and Its Reversal by Using Developed Microbial Biofilms in Agroecosystems"** Aruni Buddhika, G. Senevirtne & C. L. Abayasekara
12.15 pm	3-07	**"Effects of Two Herbicide Formulations on Avoidance Behaviour of Earthworm (*Eisenia andrei)* in Two Different Soil Types"** Chamila Hansani, R. L Asha & P. M. C. S. De Silva
12.30 pm-12.45 pm	Panel Discussion	
12.45 pm- 1.30 pm	Lunch Break	

Session Theme 04: Impacts/ Threats on Soil Biodiversity in Sri Lanka **Chaired by Prof. G. Mikunthan**		
1.30 pm	**4-01**	**Keynote address: "Pesticide Effects on Tropical Earthworms: Current Status,Trends and Future"** P. Mangala C. S. De Silva
1.45 pm	**4-02**	**"Impact of Organic Farming on Soil Biodiversity"** Senaka Bandara
2.00 pm	**4-03**	**"Properties of Soil and Plant Biodiversity in the Landslide Prone Area of Nikola Oya, Rattota"** Jinadasa Katupotha & Sumanajith Kumara
2.15 pm	**4-04**	**"Microbial Activity in Different Tea Soils in Sri Lanka as Affected by Soil Pesticides"** K. M. Mohotti & P. G. D. S.Amarasena
2.30 pm	**4-05**	**"The Influence of Anthropogenic Activities on Soil Characteristics: A Case Study from Bellanwila-Attidiya Wetland"** Deepthi Wickramasinghe ,W.D. Chethika Gunasiri, Pubudu Wewalwala & Ranjana Piyadasa
2.45 pm	**4-06**	**"Preliminary Study on the Impacts of Land Use Changes Through Some Soil Properties"** T. K. Weerasinghe, E. A. D. N. Edirisinghe & F. N .Nazar
3.00 pm	**4-07**	**Concept Paper: "Earthworms are Paid for Their Ecosystem Services: Case of Introducing Novel Livelihoods in to Rural Economy"** Leel Randeni & P. M. C. S De Silva
3.15 pm-3.30 pm	**Panel Discussion**	
3-30pm-3.45pm	**Tea Break**	
Session Theme 05: Communication, Capacity Building, Institutional Coordination & Information Management Related to Soil Biodiversity **Chaired by Mr. Gamini Gamage & Ms. R. H. M. P. Abeykoon**		
3.45 pm	**5-01**	**Keynote Address: " A Communication Strategy for the Soil Biodiversity"** Devaka Weerakoon
4.00 pm	**5-02**	**Invited Address: "National Science Foundation's role for Soil Biodiversity Researches in Sri Lanka"** Geethika Yapa & Inoka Sandanayake
4.15 pm	**5-03**	**"Evaluation of the Export Trade in Mineral Resources of Sri Lanka; Comparison with the Environmental Impacts on Soil Biodiversity"** Samantha Gunasekara
4.30 pm	**5-04**	**"Phytosanitary Significance of Soil and Soil Biodiversity"** Jayani Nimanthika
4.45 pm-5.00pm	**Panel Discussion**	
End of the Symposium		