

One day Seminar cum interactive meeting on
“Conservation and Utilization of Cinchona in the present COVID-19
Situation”
16th July, 2020
at Institute of Forest Genetics and Tree Breeding, Coimbatore.

One day seminar cum interactive meeting on “Conservation and Utilization of Cinchona in the present COVID-19 Situation” was held at the Institute of Forest Genetics & Tree Breeding, Coimbatore on 16th July, 2020. **Dr. C. Kunhikannan, Director**, IFGTB chaired the seminar.

Dr. A. Nicodemus, Scientist G and Head of Genetic and Tree Improvement Division, welcomed the gathering and highlighted the importance of Cinchona bark in the present Covid-19 situation and mentioned the past strategies about cinchona barks and its vital role in fighting malarial diseases. Many stakeholders as well as Professors from FC&RI, TNAU, KMCH college of Pharmacy, Thiruvalluvar University, CEO and Senior Research Officers from ITM & HMCRC, Nagapattinam, Retired DFO and Range officers from TNFD and IFGTB Scientists attended the seminar.

Dr. C. Kunhikannan, Director, IFGTB in his opening remarks informed that the Director General, ICFRE, in annual general body meeting of ICFRE society to come up with programs on cinchona and its role in present Covid-19 situation and its necessity for conserving the existing plantation, exploring the scope of further expansion and their utilization. He urges to develop possible strategies to bring out herbal formulations / drug for this pandemic situation.

Dr. D. Rajasugunasekar, Scientist- F and Co-ordinator of this seminar, in his introductory remarks briefed the overview of this seminar and stressed the importance of the conservation and utilization of quinine and existing scenario of their availability. He also urges the stakeholders to come together to have some possible remedy for this current pandemic situation using the important resource.

He further clearly projected the need for the conservation and utilization of cinchona in the present Covid-19 situation. The cinchona bark and its derived quinine alkaloids were playing increasingly important role in the occupation and effective administration of tropical colonies. Cinchona was introduced in India in 1859 (Nilgiris), and now it is grown at Nilgiris and Anamalai hills (Tamil Nadu) and in Darjeeling (West Bengal). Commercially grown species are *Cinchona ledgeriana*, *C. officinalis*, *C. robusta* and *C. succirubra*. He pointed out the colonial initiatives in expansion of Plantations and Exploration of quinine. He highlighted that the Indian Council of Medical Research (ICMR) has issued an advisory for using anti-malarial drug hydroxychloroquine as a medicine against the coronavirus. He called for conservation and expansion of Cinchona through deployment of various tree improvement strategies, clonal propagation and establishment of germplasm by collecting seeds from superior genetic resources.

Dr. N. Senthil Kumar, Scientist F and Head of Chemistry and Bioprospecting Division, discussed about the prospects of quinine & other alkaloids from bark of Cinchona. The importance of quinine in treating Covid-19 as it is used earlier as antimalarial drug which is the chief drug from cinchona. US urge the HCQs in treating Covid-19 and HCQ has ability to control the cytokine release syndrome (CRS), suppress hyperactive immune response and subsequently promote tissue repair. Various reports and articles show that quinine is potential in treating Covid-19. The other drugs to treat Covid-19 are LPV/r, Remdesivir and Arbidol. He expresses his aims to screen quinine compounds from cinchona in Tamil Nadu for addressing the current situation.

Prof. Dr. K. Kumaran, Department of Forest Biology & Tree Improvement, Forest College & Research Institute, TNAU, Mettupalayam, Coimbatore presented brief overview of Cinchona, methods of plantation, climate and soil, pest and diseases, conservation- (in-situ & ex-situ). commercial extraction of Quinine and their importance.

Mr. M. Sundram, DFO (Rtd), TNFD who connected online through google meet shared his experience about Cinchona plantation and various issues reeled with quinine extraction. He gave his views about the Cinchona plantation in Tamil Nadu (Nilgiri & Annamalai), climate, soil factor and scope for cinchona plantation.

Mr. C. Angamuthu, Range Officer (Rtd), TNFD who shared his experience in Cinchona cultivation and their role and stressed on its usage by the local people, who knows the value of Cinchona bark. He suggested that even sapwood and leaves should also be taken into consideration for extraction of quinine. He said that initial survey and exploration has to be carried out for locating the plantations and vegetation propagation in nursery.

Dr. R. Arivukkarasu, Associate Professor, KMCH College of Pharmacy who connected online through google meet presented the pharmacological aspects of Cinchona, and said that apart from alkaloid, there is phenol and flavonoid like Quercetin, Rutin Apigenin. He suggested that apart from Cinchona bark, leaves and sapwood should also be considered for drug development. He also suggested other species like *Andrographis paniculata* and other species which are having anti- viral properties.

Dr. Ruso, CEO, ITM & HMCRC who connected online through google meet presented the chemistry perspective of quinine with other comparatives and their commercial values. He explained about the physical properties and the process of extraction of quinine from *Jesuit bark*. He informed that it contains 25-30 alkaloids in jesuit bark and has huge demand, approx. USD 804.98 million in 2018. He compared HCQ and Artemisinin with Quinine. He suggested to investigate on various molecules in *Aristolochia indica*, *Aristolochia bracteolate* and *Alangium salviifolium* for better productivity of similar drugs.

Dr. D.Thirumalai, Asst. Professor, Dept of Chemistry, Thiruvallur University who connected through google meet presented on Chemistry behind working of drugs. He explained about the biological function of drug upto molecular level, explained, how viral RNA interpret as like human DNA and how it collapse Human DNA. He also explained about preventive ways to eradicate viral RNA and its inhibitors like viral reverse transcriptase. He mentioned about quinine functionality on malaria upto their molecular level in treating malaria.

Dr. D. Chellasamy, Sr. Research Officer, ITM & HMCRC who connected through google meet shared importance of Nanotechnology and its role in medical aspects. He shared his knowledge in the development, history and application of nanotechnology in various aspects like cancer, medical robotics, cell repair and surgery. He explains action of drug delivery to specific sites there by reducing side effects.

In the **concluding remarks, Dr.Rajasugunasekar** briefed about all presentation in the seminar. Prof. Dr. K. Kumaran concludes that this seminar is the right platform in the current Covid-19 scenario and their possible solution where Cinchona and important species can be analyzed and to propose a project. Dr. C. Kunnikannan, Director during his concluding remarks thanked all resource persons and participants and highlighted the importance and need for research development. He urge the co ordinator to discuss and come out with a feasible project proposal.

Dr. D. Rajasugunasekar concluded the seminar with formal vote of thanks to all especially the resource persons from different institutes, University who connected online through google meet and IFGTB scientists for their co-operation to conduct this seminar. He reaffirmed to come up with a project proposal of the meaningful deliberation on this contemporaneous topic.



