PROJECTS COMPLETED DURING THE YEAR 2006-2007 (Externally Aided)

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Project 1: Documentation of best practices in collection and processing of NWFPs in Chhattisgarh [089/TFRI-2005/Agro-CGMFP(13)/ 2005-2007]

Findings: Field visits have been made to document the collection and processing methods of NTFPs in all 16 divisions of Chhattisgarh. The Collected data were compiled, tabulated and analysed for preparation of the final report.

Project 2: Training of societies in collection and grading of NWFPs [090/TFRI- 2005/Agro-2 CGMFP(12)/ 2005-2006]

Findings: Training was imparted to the forest officials and VFC members of following districts namely Bilaspur, Kathghora, Korba, Pendra, Dharamjaigarh, Janjgir, Raigarh, Durg, Rajnandgaon, Khairagarh, Kawardha, Raipur, Mahasamund, Dhamtari, East Raipur (Gariyaband) and Udanti van mandal (Mainpur) of Chhattisgarh on ﷺCultivation and processing of Lac and Medicinal Plantsﷺ.

Project 3: Developing coalition approach to non-timber forest product for better livelihood of tribal communities of Madhya Pradesh [053/TFRI-2003/Agro-1(DFID)(10)/ 2003-2007]

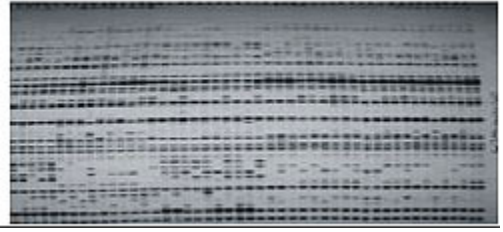
Findings: Technique of lac cultivation established, maintained and standardized in the study sites viz. villages of Bhajia, Bisenpura, Mehdar and Majhegaon (Kundam block of Jabalpur). Broodlac was raised on about 600 lac host trees and data recorded on yield of lac and growth of trees. Compiled and tabulated data was statistically analysed.

Project 4: Introduction of egg parasitoid, Trichogramma raoi to protect teak seed orchards from the loss caused by teak defoliator and skeletonizer [086/TFRI-2005/Ento- 3 (MPFD)(11)/ 2005-2007]

Findings: Utilization of indigenous egg parasitoid, Trichogramma raoi to protect Teak Seed Orchards (TSOs) from the loss caused by teak defoliator and skeletonizer, proved that application of egg parasitoid between July to September at 1.25 lakhs/ha was highly effective to minimize the intensity of pest attack and annual growth loss in TSOs as compared to the unreleased sites.

Project 5: Taxonomy and documentation of fungi occurring in forests of Madhya Pradesh and Chhattisgarh [061/TFRI-2003/Path-1(CSIR)(7)/ 2003-2007]

Findings: Fungi were collected from forests of Madhya Pradesh and Chhattisgarh. A total of 813 collections were made from plant parts and soil fungi were isolated from 144 soil samples. Total 249 fungi were identified, described in detail with photographs and camera lucida drawings. Documentation and genus wise record of fungi was prepared. The study revealed 2 new genera, 24 new species, 28 new records of fungi from India and 73 new host records for the fungi. The new genera proposed are: Acrodictiella and Kamalomyces, while the species reported new to science are: Acrodictiella indica, Acrostroma madhucae, A. sterculiae, Corynespora pogostemonis, C. supkharii, C. woodfordiae, Denticularia terminaliae, Hypoxylon



dendrocalami, H. spiralis, Hysterium jabalpurensis, Kamalomyces indicus, Kameshwaromyces butiicolous, Meliola ougeiniae, Mysterosporiella terminaliae, Phaeoseptoria shoreae, Phomopsis ougeiniae, Pseudocercospora isorae, P. schleicherae-oleosae, Rehmiodothis bambusae, Sirosporium aeglicola, S. xylopyrae, Stenella flacourticola, S. liliacearum, and S. satpurensis. The record of identified fungi from forests of M.P. and C.G. was prepared tree wise. In this regard total 803 fungi were listed including 656 fungi on 138 trees, 32 on bamboos and grasses, 8 on palms, 41 on shrubs, 15 on climbers, 13 on herbs, 2 on ferns, 13 on dead wood and dead twigs, 2 on dead unidentified bark, 3 on leaf litter and 18 in rhizosphere soil of tree species. The fungi were also classified on the basis of forest types of M.P. and C.G., into 17 groups. A mycology herbarium of forest fungi was established at the institute and 813 specimens were systematically arranged and kept in herbarium cabinets. An identification service for forest fungi has been started at the institute.

Project 6: Studies on cataloguing the genetic variation in teak species (Tectona grandis and Tectona hamiltonii) using molecular markers [052/TFRI-2003/Gen-1(DBT)(7)/ 2003- 2006]

Findings: Teak populations collected from different forest types of the country were assessed for molecular genetic variation using ISSR and AFLP markers. Analysis of DNA polymorphism detected very high levels of genetic diversity in the teak populations. ISSR analysis of 29 teak populations detected high Nei's genetic diversity (0.36) than AFLP analysis of ten populations (0.26). Most of the teak populations grouped according to their distribution range. In ISSR assay using 29 teak populations, intra-population variation was high (91%) than interpopulation variation (3%). AFLP assay using 10 teak populations detected similar trend for albeit comparatively less values (67% intra-population variation and 27% inter-populations variation).

Project 7: Standardization of production technology of some important medicinal plants under tropical climate of Madhya Pradesh [055/CFRHRD-2003/1(MHFW)(5)/ 2003-2007]

Findings: *Emblica officinalis* (Aonla): Non-destructive harvesting method to harvest aonla fruits was standardized. Major active ingredients viz. ascorbic acid, gallic acid and tannins were estimated in Aonla fruits collected at different time of maturity. January was found the best time to harvest Aonla fruits as it contained higher amount of ascorbic acid. Influence of storage on ascorbic acid content was studied. Green chip grating and drying in sun was found the best method of processing of Aonla fruits.

***Rauvolfia serpentina* (Sarpagandha):** Manure requirement for the cultivation of Sarpagandha was standardized. Vermicompost 2.5 kg plus 5 kg FYM per bed was found superior among all the treatments. April-May was found the best time to sow Sarpagandha seeds to raise seedlings. March- April was found the best time for vegetative propagation through root and stem cuttings. December was found the best time to harvest Sarpagandha roots as at this time it contained higher amount of alkaloids. Non-destructive harvesting practices were standardized for the tropical climate of Madhya Pradesh. Total alkaloid and reserpine content were estimated in Sarpagandha roots. Seeds (7 Kg) were collected for distribution among farmers.

***Andrographis paniculata* (Kalmegh):** Cut method was found superior over uproot method. March- April was found the best time to raise nursery for Kalmegh. Kalmegh samples were analyzed for andrographolide content using HPLC. The variations in andrographolide content were found among samples collected during different time of maturity and locations. Seeds (2 kg) were collected for distribution among farmers/SFDs.

***Gymnema sylvestre* (Gurmar):** Vermicompost 2.5 kg plus 5 kg FYM per bed was found superior to raise Gurmar. The vegetative propagation techniques were standardized. Woody cuttings planted in the month of July performed well in terms of rooting (60%). The Gurmar seedlings were also raised from seeds. However, the germination percentage was only 40%. October-November was found the best time to harvest the leaves. As Gurmar is a climber, it requires support for its development. Gymnemic acid was estimated from the leaves of Gurmar.

***Tinospora cordifolia (*Gurbel or Giloe):** Vegetative propagation techniques were standardized. April- June was found the best time to raise plantlets. Cuttings treated with 500 ppm IBA got 100% rooting. Ninty five per cent germination was recorded in the seeds sown in the month of October. Manure doses were standardized for the cultivation of Giloe. Giloe is a climber, the support system plays vital role in the development and growth of Giloe. Non-destructive harvesting practices were also standardized. The drying and processing technique were developed for Giloe.

***Gloriosa superba* (Kalihari):** Kalihari seedlings were raised from seeds. However, germination percentage was very poor being only 15 %. One-year old rhizomes raised from seeds were planted in nursery. For cultivation of Kalihari good support system is required as Kalihari plant is very tender. Colchicine was estimated from Kalihari rhizomes and seeds.

Project 8: Study of Sal mortality in Forest Divisions of Chhattisgarh [074/TFRI- 2004/Patho-3(CGFD)(10)/ 2004-2007]

Findings: Dying of Sal is observed from top to downwards where fire and grazing are common. Soil analysis showed less organic matter and compactness which reduced its moisture holding capacity. The affected Sal trees showed 40-60% rot in the heartwood. In some observations, a root rot fungus Polyporus shorae was recorded. Ectomycorrhizal development and regeneration of Sal were very poor. There is needed to improve the organic matter in Sal mortality area by adopting measures for protection from fire and grazing.

Project 9: Non-destructive harvesting practices for selective MFP-Nagarmotha [094/TFRI/2005/NWFP-6(CGFP)(17)/ 2005-2007]

Findings: Different forest areas viz. Hagaria Nala and Haff Nadi, Bissaraghat, Pandaria, Khawardha; Amadoh Nala, Kewchi range, Marwahi Forest Division; Khandajhari Nala, Komakhan, Abhunpur; Chargao, Bhabbar Ganj River, and Kajool Nadi, Dhugli and Dhumtari were surveyed for the occurrence of Nagarmotha. An experiment in Randomized block design with plot size 1x1 meter with 4 treatments and 3 replications were set up in Kajol Nadi in the month of May June 2006. Total plants were counted in each experimental plot and 60%, 70%, 80% and 90% Nagarmotha plants were uprooted, rhizomes were removed and essential oil was estimated to be 0.06%. The experiment was evaluated in the month of December to ascertain efficacy of the above harvesting intensity for regeneration and

sustainability. From the experiment it was inferred that for non destructive sustainable harvesting plants should only be harvested up to 80-90% to ensure proper regeneration.

Project 10: Processing techniques of NWFP Aegle marmelos (Bael) [095/TFRI/ 2005/ NWFP-7(CGFP)(18)/2005-2007]

Findings: Different forest areas viz. Badora and Rhamankappa in Pandaria, Kawardha and Mohgao in Kharagarh, Chattisgarh were surveyed. Unripe and matured fruits of Aegle marmelos in the month of January-February 2006 and ripe and matured fruits in the month of May-June 2006 were collected. Fruits from all the 3 localities were slightly cracked and processed by 3 different methods for the development of best processing techniques of bael fruits. Results indicated that Rhamankappa fruits were best in terms of size, amount of pulp, colour and texture of the pulp as well as taste. Fruits from this locality also yielded best quality pulp with less amount of mucilage. Among different processing methods tested, sun drying method was found to be the best.