

CSIR Funded Projects

- 1) Immuno Modulatory Function of Nutritionals and Nutraceuticals for Health and Wellness (Immunity Mission)
- 2) Development of high value feed and Safety and efficacy evaluation of nutraceuticals and pharmaceuticals
- 3) Introduction, Characterization and cultivation of *Ferula assafoetida* (Heeng) in cold desert regions of Indian
- 4) Plant extractives for organ health (CSIR-immunity Mission): The main focus of the project to develop medicinal plant based nutraceutical product from for kidney health
- 5) Traditional Knowledge Digital Library: Creation of repository of folk knowledge with a focus on Sowa Rigpa.
- 6) High resolution NextGen remote sensing for medicinal, aromatic and commercially important crops: Monitoring and analysing of targeted medicinal, aromatic and commercial crops using high resolution remote sensing for their growth, developmental and stress/health related parameters;
- 7) Conservation of threatened plant species of India: This project deals with the establishment of field gene banks, development of species distribution models, DNA barcodes, mass propagation and cultivation techniques of 50 targeted threatened medicinal plants found in western Himalaya
- 8) CSIR Aroma Mission (Phase-II): Extending cultivation of aromatic crops for indigenous production of essential oils
- 9) CSIR Floriculture Mission: Extending cultivation of floriculture crops for indigenous production of flowers
- 10) Genetic improvement of high value medicinal plants: Development of varieties of medicinal plants to enhance their production and meet the increasing demand of raw produce
- 11) Introduction, Characterization and cultivation of *Ferula assa-foetida* (Hing) in cold desert regions of Indian: Introduction of Heeng and establishment as a commercial crop to enhance its production and meet the increasing demand of raw produce
- 12) Development of botanical formulation using *Artemisia maritima* extract for the control of aphids in cabbage/cowpea: Identification of potential sources of bio pesticides
- 13) Pilot implementation of “CSIR-Virtual Laboratory (for school students)”
- 14) CSIR-Integrated Skill Initiative (Phase-II)
- 15) DBT-Skill Vigyan Program
- 16) Preclinical Efficacy Validation in Non-Human Primate Stroke Model of Anti-Thrombin-Clot Specific Streptokinase (ACSSK), With Dual Properties of Fibrin Specific Clot Dissolution and Prevention of Arterial Re-Occlusion, for the Treatment of Acute Myocardial Infarction and Ischemic Stroke

- 17) iPRESS: Integrated Plant REgulomics Software & Server
- 18) Genetic improvement of high value medicinal plants (NCP)
- 19) Functional characterization of the host (plant) and vector (whitefly) proteins in systemic immunity and transmission of virus and virus-like pathogens
- 20) Exploration of Himalayan Plants for Novel Antimalarial Agents: Characterization of potential molecules (Phase-II)
- 21) Next generation genomics for genetic improvement of *Stevia rebaudiana*
- 22) Introduction, characterization and cultivation of *Ferula assa-foetida* (Heeng) in cold desert regions of Indian
- 23) AI based methodology for grading machine Harvested tea leaves
- 24) Development of bare-root seedling simulations system and automatic seedling transplanted for stevia (FBR)
- 25) Up-scaled production of disease free corms of saffron (*Crocus sativus*)
- 26) Development of processes for edible and industrial dyes from plant sources for enhanced income
- 27) Biostimulants Network Project titled "Bio-stimulants for stress amelioration, enhanced plant productivity and soil health
- 28) Development of botanical formulation using *Artemisia maritima* extract for the control of aphids in cabbage/cowpea (DBAM)
- 29) Genome-Editing Network Project entitled "Genome-editing for crop improvement (GE-Crop) (FBR)
- 30) Endophytes Network Project entitled "Deciphering the mechanism(s) of host-endophytes' coevaluation, enhanced secondary metabolite production and crop productivity (FBR)
- 31) Conservation of threatened plant species of India (FBR)
- 32) Development of microalgae based protein and micronutrient rich animal feed (FTT)
- 33) Trapping glycation intermediates for the modulation of diabetes and its complications: a natural product derived therapeutic approach
- 34) Characterization of reverse transcriptase (RNA dependent DNA polymerase) activity from greenhouse whitefly *Trialeurodes vaporariorum*
- 35) Bioprospecting kinetically stable lytic polysaccharide monooxygenase(s) (LPMOs) for accelerated degradation of lignocellulosic biomass
- 36) Investigating mechanisms underlying transgenerational heat stress adaptation in plants
- 37) Revealing the Chloroplast Oxi-proteome and Engineering ROS-insensitive Photosynthetic Apparatus
- 38) What makes 'asafoetida'—understanding the specialized terpenoid metabolic pathway?

Projects funded by the External Agencies

- 1) Investigation of novel formulation approaches for improving the bioavailability of dietary phytochemicals, (DST, SERB, INDIA)
- 2) Indian Bioresource Information Network: Online information system on the floral resource of the country; funded by DBT, GOI.
- 3) Promoting Conservation of Declining Life Support Forest Tree Species in Himachal Pradesh: Status, distribution, uses and plantation of four multipurpose species of the Himalayan region. funded by Ministry of Environment, Forest and Climate Change, GOI.
- 4) Himalayan Alpine Biodiversity Characterization and Information System–*Network*: Extent, characteristics and mapping of alpine regions of Himalaya. Funded by India Institute of Remote Sensing, GOI.
- 5) Prospection and Value Addition of Indigenous Foods and Vegetable Crops of Cold Desert Regions of Western Himalayas for Livelihood and Nutritional Security: Wild edible plants and recipes. Department of Science and Technology, GOI.
- 6) Modelling forest phenological parameters from time series remote sensing data: Monitoring phenology of *Pinus roxburghii* forest and its linkage with climatic drivers; funded by Space Application Centre, ISRO, Ahmedabad, Gujarat.
- 7) Preparation of People's Biodiversity Register (PBR) at *Panchayat level for Himachal Pradesh*: This project focuses on the preparation of PBRs of different Panchayats of Lahaul and Spiti and Pangi regions; funded by Himachal Pradesh State Biodiversity Board.
- 8) Preparation of People's Biodiversity Register (PBR) of seven blocks of Kangra District, Himachal Pradesh: This project focuses on the preparation of PBRs of Kangra at block level; funded by Himachal Pradesh State Biodiversity Board.
- 9) Production of *Hing* in Himachal Pradesh - A new approach: Promote cultivation of Heeng to make the country self-sufficient in its production (Department of Agriculture, Himachal Pradesh)
- 10) Manufacturing of Nutri Bar Product (Access India Impex Centre Pvt. Ltd.)
- 11) Cultivation and production of medicinal plants (Picrorhiza, Valeriana) under hydroponic system tissue culture protocols and extraction of the Produce (Amar exports, Somaj iguda, Hyderabad)
- 12) Commercial Scale Production of Tea Catechin from Green Tea Leaves, Development of Formulations as Nutraceuticals and their Human Intervention Studies (BIRAC, DBT)
- 13) Development of Herbal Formulations from Seabuckthorn (DBT)
- 14) Indian Bioresource Information Network (IBIN) Geoportal Phase III: Enhancing BioResource Services, Institutional Linkages and Outreach (DBT)

- 15) Deciphering Chloroplast Oxi-proteome for Engineering Oxidative Stress Resilient Chloroplasts in Plants (DBT)
- 16) The Himalayan Centre for High-throughput Computational Biology (HiCHiCoB) - BIC at CSIR-IHBT, Palampur (HP) (DBT)
- 17) Captive Cultivation, Development of Location Specific Agrotechnology, Downstream Processing and Value Addition of *Mentha piperita*: A Sustainable Option for Livelihood Improvement and Security in the Himalayan Region (DBT)
- 18) Establishment of bamboo treatment & seasoning plants and incense stick making (Department of Agriculture, Himachal Pradesh)
- 19) Running and maintenance of the Institutes' bamboo nurseries for generation and supplying quality planting material (Department of Agriculture, Himachal Pradesh)
- 20) Producing floriculture plants (Dev Bhumi Flower Nursery, H No 123, HB Colony, Bindrawan Palampur (H.P.))
- 21) Development of herbal Khichri (Dexter Retail and Distribution Pvt. Ltd. Kasturba Gandhi Marg, New Delhi)
- 22) Chief Minister Start-up Incubation Centre (Director of Industries (H.P))
- 23) Technical and hand holding support by CSIR-IHBT Palampur for saffron production (Directorate of Agriculture, Himachal Pradesh)
- 24) Production of Heeng in Himachal Pradesh - A new approach (RNS) (Directorate of Agriculture, Himachal Pradesh)
- 25) Transfer of technology for (i) vertical gardening (ii) indoor air pollution abatement and (iii) making herbal incense cones from temple waste flowers (Dr. Gaurav Aggarwal, Public Health Consultant, Green Tech. Solutions, Kangra)
- 26) Studies on Technology and Innovation Management (DSIR)
- 27) Development of novel functional foods for amelioration of Oxi-Inflamm-Aging and its pathogenesis in progression of inflammatory disorders during aging (DST)
- 28) Elucidating the role of host transcription factor (s) in disease development by cucumber mosaic virus (DST)
- 29) Value addition and characterization of traditional food crops of Western Himalayan for livelihood enhancement (DST)
- 30) Development of remunerative organic waste management systems for colder regions of India with the intervention of psychrophilic aerobic and anaerobic microbial consortia (DST)
- 31) Development of processing technologies for traditional complementary foods of Western Himalayas and establishment of training and processing center for local artisans (DST)
- 32) Evaluation of genetic consequences of climate change on high altitude specialist species at the altitudinal range limit of the Himalayan mountains (DST - INSPIRE Faculty Award Scheme)

- 33) Nutrient enrichment of selected edible flowers of Ayurvedic importance through hydroponics and popularizing their cultivation in Himachal Pradesh (DST (WISE-KIRAN))
- 34) Development of rapid and cost effective 'on-farm' diagnostics for plant viruses (DST-INSPIRE)
- 35) High throughput genotyping to expedite the genetic characterization and dissection of important agronomic traits of tea (DST-IBSD)
- 36) Promotion and post-harvest value addition of four important herbs for improvement of livelihood security in cold desert areas of Himachal Pradesh (DST)
- 37) Exploring epigenetic control of grain filling in wheat under heat stress (DST-INSPIRE)
- 38) Genetic dissection of micronutrient content and composition in foxtail millet grains for identification of novel genes and their characterization (DST-INSPIRE)
- 39) Gondla cut flower cluster (Foundation for MSME Clusters)
- 40) Triloki Enriched Composting / Vermicomposting Cluster (Foundation for MSME Clusters / Ministry of Micro, Small & Medium Enterprises)
- 41) Cultivation of Shiitake mushroom and its enrichments with Vitamin D2 (Gaurav Agro Food Industrial Area- II Nagri, Palampur (HP))
- 42) Sumbuk Shiitake Mushroom and Other Food Processing Cluster, Sumbuk, South Sikkim (Glen Leu Womens Service Cooperative Society Ltd, Sumbuk, South Sikkim)
- 43) Skill Vigyan Program (Himachal Pradesh Council for Science, Technology Environment (HIMCOSTE, Shimla (H.P.))
- 44) Introduction of Monk Fruit cultivation: A new initiative in Himachal Pradesh (HIMCOSTE, Shimla (H.P.))
- 45) Preparation of People's Biodiversity Register (PBR) of seven blocks of Kangra District, Himachal Pradesh (Himachal Pradesh State Biodiversity Board (HPSBB), Shimla)
- 46) Preparation of People's Biodiversity Register (PBR) at Panchayat level for Himachal Pradesh (HPSBB, Shimla)
- 47) Formulation of stevia liquid drops (Himalayan Natural & Herbal Products, Palampur, HP)
- 48) Cultivation and Production of Kutki and Jatamansi plant under hydroponic system (Hydrocrops India Pvt Ltd, Jalandhar, Punjab)
- 49) Manufacture of tea catechin (INDCOSERVE, Tamilnadu)
- 50) Himalayan Alpine Biodiversity Characterization and Information System - Network (Indian Institute of Remote Sensing (IIRS), Dehradun)
- 51) Role of viral and host factors in circulative transmission of tomato begomoviruses by the whitefly *Bemisia tabaci* (Indo-French Centre for the Promotion of Advanced Research)

- 52) Norbu Choelling Shiitake Mushroom and Other Food Processing cluster (Lametan Tingmoo Organic Growers Cooperative Society Limited (LTOGCS) Sikkim, 737 139)
- 53) Cultivation of Shiitake mushroom and its implementation at large scale (Lametan Tingmoo Organic Growers Cooperative Society Limited (LTOGCS) Sikkim, 737139)
- 54) Technology transfer agreement for Herbal Formulation for Immunity Modulation (M/s Vigada Care Private Limited, K-19A, Kalkaji, New Delhi, South East Delhi)
- 55) Technology transfer on herbal incense cones and herbal soap (M/s AB Scientific Solutions, Palampur, HP)
- 56) Development of Ready to eat Foods (M/s A Qube Inc, 29 NRI Block, Carlton Woods, Ludhiana)
- 57) Assessment of Biofertilizer for PGPR attributes (M/s Arizona Biotech Pvt. Ltd.)
- 58) Transfer of technology for Tea Wines and RTD Tea (M/s Camelia Beverages Pvt. Ltd., New Delhi)
- 59) Technology for commercial production of formulation promoting cartilage health (M/s Carols Formulations C/o Noble Product, Jalandhar, Punjab)
- 60) Technology of herbal soaps and herbal incense cones (M/s Geo Care, Baijnath, District Kangra (H.P.))
- 61) Development of Tea Based Vinegar (M/s Kaash I Wish, Sidhbari, Dharmshala, H.P)
- 62) Technology for manufacturing of (i) Granola bars - (millet and cereals based), and (ii) Spirulina peanut bar products (M/s Komal Innovation & Wellness Initiative, Nagrota Bagwan, Kangra, H.P.)
- 63) Use of LiDAR system for remote sensing (M/s Lotech World Avigation Pvt. Ltd., Gurgaon, Haryana)
- 64) Processing technology for extraction of steviol glycosides (M/s MDHP, Raipur (C.G.))
- 65) Establishment of stevia plantation (M/s MDHP, Raipur, C.G.)
- 66) Process for extraction and stabilization of natural colours and their applications in food and cosmetics (M/s Nano Tech Chemical Brothers Pvt. Ltd., Village Mangarh, Post office Kohara, Ludhiana)
- 67) Micropropagation of gerbera, potato and bamboo (*Bambusa balcooa*) (M/s Pratyaksha Agrotech Pvt. Ltd., Assam)
- 68) Technology for Herbal Formulation for Immunity Modulation (M/s Ras Vaidyashala, Jobner, Jaipur, Rajasthan)
- 69) Manufacturing/processing technology of ready to eat foods (RTE) free from chemical preservatives (M/s Singh Agritech, Kashipur, Uttarakhand)

- 70) Cultivation of shiitake mushroom and its enrichment with vitamin D2 (M/s Taqgene Training and Research Enterprise (TGTRE), Near Subhatri Hospital, Kotda Santoor, Nanda Ki Chwoki, Prem Nagar (Uttarakhand))
- 71) Technology for making travel/pocket perfumes (4-5 variants) (M/s The Fragrance, Maranda, Palampur, H.P.)
- 72) Characterization of efficient Nitrogen fixing (NFB), Phosphorous solubilizing (PSB) and Potash mobilizing (KMB) bacteria from organic farmlands of Sikkim (ToT) (M/s Vendeeep Green Globe Organic Venture Pvt. Ltd., Majitar, East Sikkim-737136)
- 73) Technology for manufacturing/processing of multigrain protein powder and Technology for manufacturing/processing of granola bars (millets & cereals based) (M/s. Access India Pvt. Ltd., New Delhi currently M/s. Lennix Inc., New Delhi)
- 74) Technology for commercial production of nutraceuticals fortified beverage mixes and energy bars (M/s. MAK Biotech, New Delhi)
- 75) Technology for manufacturing/processing of granola bars (millets & cereals based) (M/s. Sirimiri Nutrition Food Products Pvt. Ltd., Bengaluru)
- 76) Technology for manufacturing/processing of granola bars (millets & cereals based) (M/s. Sumati Foods, Baddi)
- 77) Technology for manufacturing/processing of multigrain protein powder (M/s. Unati Co-operative Marketing cum Processing Society, Talwara, Punjab)
- 78) Technology for manufacturing of Spirulina based products and Spirulina fortified multigrain granola energy bars (M/s. Yujo Agriculture and Aquaculture Farm Society, Meerut)
- 79) Cultivation of Shiitake mushroom and its enrichment with Vitamin D2 (Manav Jiwan Sudhar evam Kshamta Nirman Samity, Daragaon, Soreng West Sikkim)
- 80) West Sikkim Shiitake Mushroom and Other Food Processing cluster (Manav Jiwan Sudhar Evam Kshamta Nirman Samity, Daragaon, Soreng West Sikkim)
- 81) Metagenomic exploration for efficient and stable bacterial L-asparaginase and its nano-conjugation for therapeutic application (Ministry of Health and Family Welfare (GoI))
- 82) Identification and purification of antifreeze proteins and peptides from barley and unveiling their role in cryopreservation of RBCs (Ministry of Health and Family Welfare, GoI)
- 83) Developing bioplastic blends for food packaging using polyhydroxyalkanoate and violacein from Himalayan bacterium *Lodobacter* sp (Ministry of Science & Technology (GoI))
- 84) Moonew Tareybhair Enriched Composting / Vermicomposting Cluster (Ministry of Micro, Small & Medium Enterprises)
- 85) Development of efficient psychrotrophic bacterial formulation for preparation of enriched compost / vermicompost in cold hilly region and

- production and testing of enriched compost / vermicompost (Monnew Tareybhair Enriched Composting / Vermicomposting) (Cluster (MECC), West District, Sikkim)
- 86) Stevia cultivation in 5 acres at Hasanpur Farm (Mr. Kabir Singh, Tehsil Kichha, Distt - Udham Singh Nagar (UK))
 - 87) Cultivation of Shiitake mushroom and its enrichment with Vitamin D2 (ToT) (Multiple Parties)
 - 88) Development of Hand Sanitizer (Five Parties)
 - 89) Development of Probiotics for Plant Tissue Culture Boosting the performance of micro propagated plant materials by supplementing plant associated useful endophytes (National Medicinal Plants Board, Ministry of AYUSH, GoI)
 - 90) Production of Quality Planting Materials of Medicinal Plants Including the Rare Endangered Threatened Species for Conservation and Distribution (National Medicinal Plants Board, Ministry of AYUSH, GoI)
 - 91) Improvisation of the traditional practices of night soil composting using microbiological intervention for sustaining agro-ecosystems in the Lahaul valley of western Himalaya (NMHS-GBPNIHESD, Almora)
 - 92) Ex-situ conservation and development of gene bank of commercially important threatened medicinal plants in the high altitude areas, Himachal Pradesh (NMHS-GBPNIHESD, Almora)
 - 93) Promoting conservation of declining life support forest tree species in Himachal Pradesh (NMHS-GBPNIHESD, Almora)
 - 94) Establishment of Institutional Herbal Garden at CSIR-IHBT, Palampur (NMPB)
 - 95) Evaluation of micronutrient fortification and menu diversity on the health indices of anganwadi attending children aged between 3 and 6 in Panchrukhi block, Palampur tehsil, Kangra dist., Himachal Pradesh (Poshan Abhiyan, Directorate of Women and Child Development, Shimla)
 - 96) Exploring stress sensitivity and nutritional quality of underutilized grain amaranth (*Amaranthus* spp.) under climate change (Science and Engineering Research Board (SERB))
 - 97) Studies to identify host factors that are manipulated by cucumber mosaic virus for disease development and spread (SERB)
 - 98) Rapid and onsite diagnostic for viruses and viroid infecting apple (SERB)
 - 99) Comparative structure modeling and simulation approach to improve the bio-physicochemical properties of industrial important enzyme Superoxide dismutase obtained from *Potentilla atosanguinea* (SERB)
 - 100) Evaluation of role of endophytes in mogroside production of *Siraitia grosvenorii* (SERB)
 - 101) Investigation of Novel Formulation Approaches for Improving the Bioavailability of Dietary Phytochemicals (SERB)

- 102) Taxonomic characterization and geospatial distribution of the genus *Cremanthodium* Benth. In Indian Himalaya (SERB)
- 103) Does it take two key regulatory genes ASYMMETRIC LEAVES1 and REVOLUTA to make a pitcher in *Nepenthes khasiana*? (SERB)
- 104) Chemometrics as Inventive Tool for Quality Assessment of Medicinal Plants: A Case Study with *Aconitum heterophyllum* (Nation Priority Plant) (SERB)
- 105) Ramanujan Fellowship RJF 12020 I 000070- Effects of alpha2-antiplasmin on fibrosis, neovascularization and inflammation in chronic deep vein Thrombosis (SERB)
- 106) Elucidating the thermoresponsive pathway underlying the regulation of flowering in saffron (*Crocus sativus*) (SERB)
- 107) Deciphering the mechanism of epidermal cell differentiation leading to prickly formation in *Rosa hybrida* (SERB)
- 108) Evaluation of thermostable variants of copper, zinc superoxide dismutase in combating oxidative stress in *Arabidopsis thaliana* (SERB)
- 109) Next-generation genomics for genetic improvement and conservation of endangered Himalayan medicinal herb, *Saussurea costus* (SERB)
- 110) Cisgenetic engineering of rice (*Oryza sativa*) susceptible elite cultivars for enhanced disease resistance using genome editing CRISPR/Cas9 technology (SERB, GOI)
- 111) Establishment of hydroponic facility for production of Liliium and Tulip plants (Sh. Akshat Goel, Sukhdev Vihar, New Delhi)
- 112) Evaluation of safety and nutritional quality of Guar protein concentrate (M/s Shree Ram India Gums India Pvt Ltd, Rajasthan)
- 113) Characterizing Patterns and Processes of Alpine Ecosystem in Indian Himalaya with Special Emphasis to Himachal Pradesh (Space Applications Centre, ISRO, Ahmedabad)
- 114) Cultivation of Shiitake mushroom and its enrichment with Vitamin D2 (Sumbuk Shiitake Mushroom and Other Food Processin Cluster Sumbuk, South Sikkim)
- 115) Cultivation of Shiitake mushroom and its enrichment with Vitamin D2 (TAKEFarms, Gangtok)
- 116) Consultancy under Core Support Program of DST for S&T interventions in Chowari Block of District Chamba (The Society for Technology & Development, Mandi, H.P.)
- 117) Development of efficient psychrotrophic bacterial formulation for preparation of enriched compost / vermicompost in cold hilly region and production and testing of enriched compost / vermicompost (Triloki Enriched Composting / Vermicomposting Cluster)
- 118) Bio-prospecting and product development from *Curcuma longa* (turmeric) in Uttarakhand (Uttarakhand State Council for Science and Technology)