

Quality Control laboratory, Tea Board Siliguri

1. History & Background of project

Tea Board of India had submitted a project proposal to the Ministry of Commerce & Industry, Govt. of India for establishing a Quality Control Laboratory (QCL) to meet the international regulations and facilitate Tea Export at Siliguri under ASIDE scheme (2008-12). The above project was duly approved by the Ministry of Commerce & Industry, Govt. of India under ASIDE scheme.

A land was purchased by Tea Board on 12.05.2009 from Siliguri ,Jalpaiguri Development authority at Tea Park . The initial plan was to construct a building of G+2 and later it was decided that G+4 will be constructed. Covered area for each floor is 2000 sq m (approx). The building was constructed by CPWD

2. Need for creation of Laboratory

Darjeeling tea (flavour) is unique in the world for its quality which is distinctly different from other types of tea produced in different parts of the country and elsewhere. Quality requirement of tea has undergone considerable changes over the years. The aims of organic tea producer are to grow a crop that is free from chemicals. Decrease in use of pesticides and using more organic farming needs to be reviewed in the face of growing concerns for health, food safety and environment which are reflected in stringent food safety regulations. Enhancement and sustenance of the quality of Darjeeling tea is a major challenge and comes under a thrust area of research for Darjeeling tea industry. The presence of undesirable substances like pesticide residues, heavy metals, microflora and mycotoxins reduces the quality and thereby the consumer acceptability of the food items. For sustaining in the global market scenario it needs to be ensured that

the tea produced is free from all the undesirable elements according to internationally accepted standards.

Thus establishment of a quality assurance laboratory has been a long felt need of the Darjeeling Tea Industry. A State of the art Quality Control Laboratory has been set up at Tea Park Siliguri for analysis of biochemical parameters pesticide residue heavy metals etc .The laboratory has received NABL accreditation for testing of biochemical parameters of tea as per FSSAI along with some pesticides

Quality Testing laboratory is providing service to stakeholders for testing quality parameters pesticide residues, heavy metals on commercial basis. There is also a Capacity centre at QCL.

3. Service provided:

- Testing of quality parameters of tea
- Testing of pesticide residue
- Detection of heavy metals
- Microscopic examination of Tea
- Analysis of microflora
- Organization of trainings specific for Darjeeling and North Bengal cultivation and production

Type of facilities available:

Installation of high end analytical instruments to set up a laboratory of international standard has been done. This facilitates analysis of pesticides and pesticide residue, fertilizers, biochemical parameters etc concerned to tea quality, microbiological parameters and genetic analysis of tea.

Important Equipments available: High end analytical of international standard are there in the laboratory to facilitate analysis of pesticides & pesticide residue, fertilizer, biochemical parameters concerned to

tea quality, microbiological parameters and genetic analysis of tea to find its origin. Some Major instruments include

LC MS MS, GC MS MS, ICP MS MS, Laminar flow, Autoclave, Spectrophotometer, GC, HPLC, Microscope etc.

Manpower: The centre is manned by highly qualified scientists having experience in analytical areas of biochemistry/ pesticide residue, microbiology and biotechnology/molecular biology etc. A field expert is also available responsible for field related trials. Apart from scientists the centre has specifically qualified manpower like research fellows/laboratory assistants/field assistants who are required for smooth functioning of the project work. The overall activities of the laboratory are monitored by Quality Control Manager and In-Charge of Quality Control Laboratory.

NABL accreditation: Laboratory accreditation has become an essential requirement for the validation of data generated from different experiments particularly for the compliance of both national and international standards. National Accreditation Board (NABL), New Delhi accredits laboratory which follow their mandate. Accordingly, Quality Control Laboratory has obtained NABL accreditation which is a key for maintaining highest quality standards.

Description of the services to be provided:

Pesticide residue analysis: Tea plants are attacked by a number of pests and diseases, which are the major limiting factor in crop productivity. Pesticides have been important input in tea plantations in reducing the loss caused by insect pests. Besides this, large numbers of herbicide are also used in tea gardens to control weeds. Stringent MRLs are set by various importing countries on the pesticides and in a number of cases they approach the limit of analytical determination.

The maximum permissible residue limits for pesticides in tea fixed by different international regulatory bodies. Testing of tea samples with regard to detection of pesticide residue is being undertaken in this infrastructure for the service to the industry.

Bio-fertilizer and Bio-pesticides: Some of the important inputs on this area is required by the tea industry on regular basis. At present the requirement of bio-fertilizers and bio-pesticides are increasing at a rapid rate for the organic tea cultivation of Darjeeling tea industry. Although the availability of bio-formulations are increasing in the market, quality of such products are being questioned many a times. The necessity for quality check is very important and we propose to investigate and certify these products for the benefit of the Tea industry. A major amount of work will be concentrated for this service to the industry in future.

Detection of Heavy metals: The intake of food contaminated by heavy metals is harmful to human health and several countries have imposed food laws to restrict the presence of heavy metal concentrations in food and beverages. Various reports have discussed the potential health implication of trace metals in tea, since the tea bush is known to accumulate them, the main sources of heavy metal in plants are their nutrients, agro inputs and soil. Other sources may include pesticides and fertilizers and some metals gain entry from the machineries used in tea processing. Chromium, Copper, Nickel, Cadmium and Lead are some times reported to be present in processed teas. Detection of heavy metals is another important area on which QCL is concentrating.

Analysis of pathogenic and non pathogenic Micro flora & mycotoxins

Among manufacturing conditions, factory hygiene plays an important role. It has been reported that excessive microbes in the dhool can interfere with the quality of the final product. Higher microbial counts are also found if the tea is not handled carefully during packaging and sorting. The limit prescribed on microbial count is being followed by various countries as per their regulatory norms. Detection of micro flora is being studied to maintain the quality of tea for internal consumption and export purpose.

Screening and development of superior tea cultivar:

High quality tea cultivar is always an essential requirement for the tea industry. Development of superior tea cultivar with special reference to quality attributes required for Darjeeling tea industry will be given high priority for initial screening in the field followed by laboratory validation for their quality characters (aroma and flavor). Some of the molecular intervention like gene expression (functional genomics), determination of the influence of the environment (agro-climatic condition) through environmental genomics and the protection of Darjeeling tea through molecular documentation (both green leaf and made tea) will be undertaken.

Organization of training/ capacity building specific to Darjeeling tea cultivation and production:

- Organize training/ workshop for Darjeeling tea industry
- Awareness on Good Agricultural Practices for Organic tea cultivation
- Facilitate GAP amongst STGs also awareness on cultural practices

- Conducting programs on *GAP*, *PPC* at different locations across Darjeeling etc.
- Conducting internal seminar/ in-house seminar at *QCL*.