

A PROJECT REPORT ON
DETERMINATION OF QUALITY PARAMETERS IN MADE TEA
SAMPLES



Submitted by

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With regards
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ABSTRACT

The project work entitled "Determination of Quality Parameters in Made Tea)" was carried out at Analytical service Department, Tocklai Tea Research Institute, Jorhat . Tea is one of the most commonly used and lowest cost beverages in the world. After water it is the most widely consumed drink. It has several health benefits. In the present study 16 samples are from the locality and are analyzed for quality parameters. All the samples that were analyzed for quality parameters were within the standards set by the FOOD SAFETY AND STANDARD AUTHORITY OF INDIA (FSSAI). Hence, the quality aspects of these samples were well maintained and they are fit for human consumption.

1. INTRODUCTION



Tea is one of the most popular and low cost aromatic beverages in the world consumed by a large number of people. There are two varieties of tea plants one with small leaves and other with large. Tea is one of the most popular and low cost aromatic beverages in the world consumed by a large number of people. There are two varieties of tea plants one with small leaves and other with large Tea is one of the most popular and low cost aromatic beverages in the world consumed by a large number of people. There are two varieties of tea plants one with small leaves and other with large leaves. Depending on the process of manufacture the different types of tea are:

Black tea: In this process the plucked leaves are allowed to wither, which precedes a process called oxidation. Black tea has the highest caffeine content.



Fig: Black tea

(ii) **Olong tea:** Leaves are allowed to undergo partial oxidation. This tea has a caffeine content in between green tea and black tea.



Fig: Olong tea

(iii) **Puer Tea:** It is an aged black tea from China prized for its medicinal property and earthy flavor.



Fig: Puer tea

(iv) **White tea:** These are the most delicate tea of all the teas. They are appreciated for their complexity and natural sweetness.



Fig: White tea

(v) **Green tea:** Leaves are allowed to wither slowly after being picked. Green tea has the lowest caffeine content.



Fig: Green tea

Again, black tea can be of two different types depending on the machinery used in the manufacturing process:

- **CTC (crush tear curl):** It is a method of processing black tea in which the leaves are passed through a series of cylindrical rollers with hundreds of sharp teeth that crush curl and tear the tea into small hard pellets.

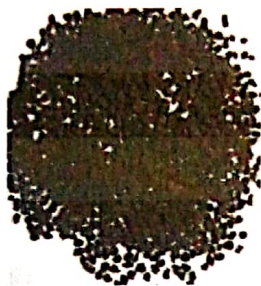


Fig: CTC tea

Orthodox: Orthodox teas are whole leaf teas manufactured using traditional technique.



Fig : Orthodox tea

There are three kinds of tea produced in India at three different agroclimatic areas namely:

(i) Assam tea (ii) Darjeeling tea (iii) Nilgiri tea

Globally, Tea is cultivated in 3.94 million hectares with an annual production of 4162 million kg. India ranks second in terms of area (0.58 million hectares) ,and production (966 million kg).(1)

It has been suggested that green Tea and black Tea may protect against different types of cancer, because of the the catechins found in green Tea that are thought to be more effective in preventing certain obesity – related cancer such as liver and colorectal cancer.

The quality parameters that are tested in made tea are theaflavins, highly polymerized substances, total liquor color, total soluble solid(water extract), total ash, water soluble ash, alkalinity of water soluble ash (as KOH), Acid insoluble ash and iron filings.

2. OBJECTIVE OF THE PROJECT WORK:

The objective of the project work is –

“Determination of quality parameters (moisture %, total ash % ,water soluble ash %, alkalinity of water soluble ash %in terms of KOH, acid soluble ash %)in made tea.”

3.METHODOLOGY:

The work was carried out in the Analytical Service Department, Tocklai Tea Research Institute, Jorhat, Assam.

Duration of project work: From 1st Dec to 29th Dec 2017

The 16 tea samples are collected from the locality.

4. MATERIALS

Requirements and reagents:

Weighing bottle, Oven, Desiccator,Analytical balance, crucible, Muffle Furnace, Sintered glass crucible, Conical flask, Methyl orange indicator ,Ash less filter paper, 0.1 N HCl, Distilled Water

5. METHODS AND RESULTS

(i) Determination of loss of mass at 103°C (moisture %)

The weighing bottle are prepared by keeping in oven at $103 \pm 2^\circ\text{C}$ along with open lid and cooled down by keeping it in a desiccators and then weighed for constant weight. About 5g of the samples is weighed to the prepared weighing bottle. The samples are then heated in the oven at $103 \pm 2^\circ\text{C}$ for 16 hours. The weighing bottles were taken out from the oven and were cooled in a desiccators and weigh for constant weight. [2]

RESULTS:

Sample no.	Moisture%
1	7.25
2	6.53
3	3.49
4	3.29
5	4.53
6	6.73
7	7.45
8	5.62
9	6.07
10	7.23
11	3.76
12	5.54
13	4.66
14	7.88
15	4.69
16	7.32

(ii) **Determination of total ash % in Tea** The silica crucible is heated at $525 \pm 25^\circ\text{C}$ for 1 hour. Then it is cooled down in the desiccators and then weighed to nearest 0.001g. .5g of the ground tea sample is then weighed on the crucible. The sample is heated in the crucible at 100°C till the moisture is expelled. The crucible is then transferred to the furnace and heated at $525 \pm 25^\circ\text{C}$ at least for 4 hours and then allowed to cool. Then it is moistened with distilled water, and dried in oven at 103°C for three hours. Then it is cooled in a desiccator and weighed to nearest 0.001g. [2]

RESULT

Sample no.	Total ash(% by mass)
1	7.05
2	6.89
3	6.57
4	6.77
5	6.94
6	7.05
7	7.04
8	7.10
9	6.49
10	6.79
11	7.16
12	7.24
13	6.43
14	5.96
15	7.09
16	6.96

(iii) Determination of water soluble ash as % of total ash

We use the total ash obtained. We add 20 ml of the distilled water and heat it nearly to boiling. Then it is filtered through ash less filter paper and then washed properly with hot distilled water (about 40ml). The residue with the filter paper is transferred to the crucible and heated at $525 \pm 25^\circ\text{C}$. It is cooled in the desiccators and weighed. The filtrate is kept for testing the alkalinity of water soluble ash [2]

RESULT

Sample no.	Water soluble ash of total ash(% by mass)
1	55.38
2	55.37
3	60.27
4	60.60
5	56.91
6	61.02
7	56.69
8	56.60
9	60.14
10	55.56
11	61.27
12	61.14
13	57.84
14	59.93
15	61.34
16	59.59

(iv) Determination of Alkalinity water soluble ash as KOH%

The filtrate obtained from water soluble ash is titrated with 0.1 N HCl using methyl orange as indicator [2]

RESULT

Sample no.	Alkalinity of water soluble ash as KOH
1	2.00
2	1.90
3	2.16
4	2.17
5	1.95
6	2.32
7	2.05
8	2.08
9	2.11
10	2.04
11	2.62
12	2.61
13	1.95
14	2.10
15	2.47
16	2.13

(v) Determination of water extract % in tea

The sintered glass crucible is prepared by heating it in the oven at 103°C for 1 hour and cooling it in desiccators for constant weight. 2g of the ground sample is weighed to a 500 ml conical flask. 200 ml of hot distilled water is then added to it and refluxed for 1 hour .We then filter it hot using the already prepared sintered funnel under vacuum with repeated wash by another 200 ml hot distilled water. The crucible with the content is then heated in the oven at 103°C for 16 hours and then cooled in desiccators and weighed for constant weight. [2]

RESULTS

Sample no.	Water soluble extract (% by mass)
1	37.75
2	38.45
3	41.16
4	43.68
5	39.80
6	41.40
7	37.81
8	37.70
9	43.37
10	37.71
11	43.28
12	43.78
13	41.65
14	41.98
15	42.99
16	43.93

7. Conclusion:

Tea is the most common beverage used in everyday life by almost everyone. In present study 16 tea samples were analyzed for quality parameters .All Tea samples tested in this study were well below the standards set by the **FOOD SAFETY AND STANDARD AUTHORITY OF INDIA (FSSAI)** MLC (maximum limits) in made Tea sample. The limits have been given in the following table below:

Sl. No.	Test parameters	Limits (wt%)
1.	Moisture	3-8
2.	Total Ash	4-8
3.	Water soluble ash to total ash	>45
4.	Acid insoluble ash	<07
5.	Alkalinity of water soluble ash (as KOH)	1-3
6.	Water extract	>32

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