

UNIVERSITY OF CALCUTTA
UNDER (CBES)

EXAMINATION - 2024 SEMESTER - IV

VISIT TO SAMBING TEA
ESTATE

SUBJECT - BOTA (HONS.)

PAPER - CC9 (PRACTICAL)

ROLL NO :- 223044-11-0009

REG NO :- 044-1211-0230

FIELD REPORT ON CULTIVATION AND PROCESSING OF TEA





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Date.

TO WHOM IT MAY CONCERN

This is to certify that Ms. Ashmita Chatterjee bearing Roll No. 223044-11-0009, Registration No 044-1211-0230, an examinee of B.Sc. Botany (Honours) Semester IV (CBCS) examination, 2024 of University of Calcutta has successfully completed an excursion in Tinchuley, Takdah, Lamahatta (Darjeeling district) and Chalsa (Jalpaiguri district) during 15th May, 2024-20th May, 2024 under my supervision. This is part of their syllabus to get an idea about cultivation of any crop (tea).

The examinee submitted a field report on cultivation and processing of tea which partially completes the Practical part of paper CC-9 of Botany Honours Course.

Sontu Bugh 3/6/24

Mr. Sontu Bugh

Assistant Professor & HOD

Dept of Botany

Kinjalkini Biswas 23.8.24

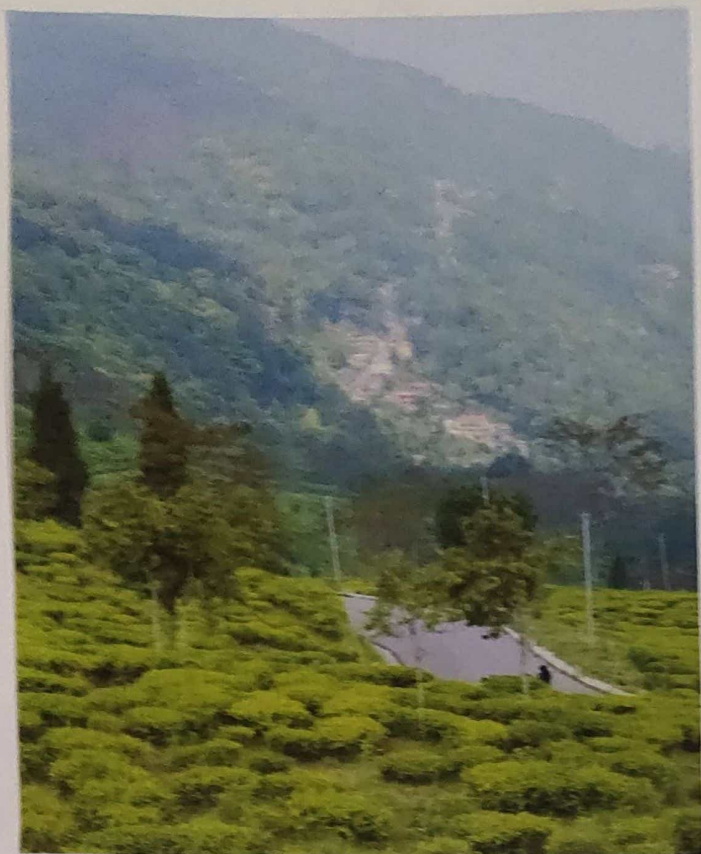
Dr. Kinjalkini Biswas

Principal

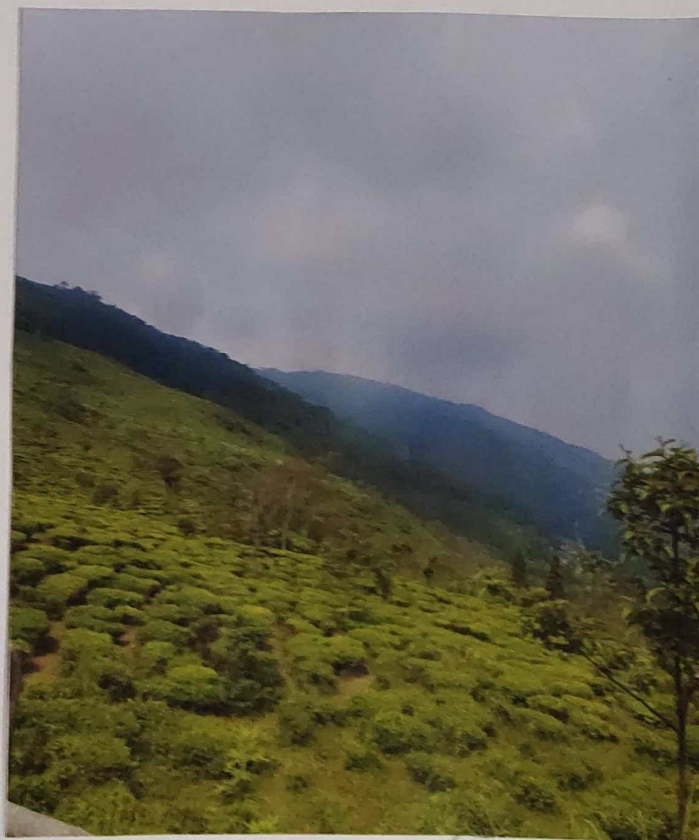
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Lady Brabourne College
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Tea plantation



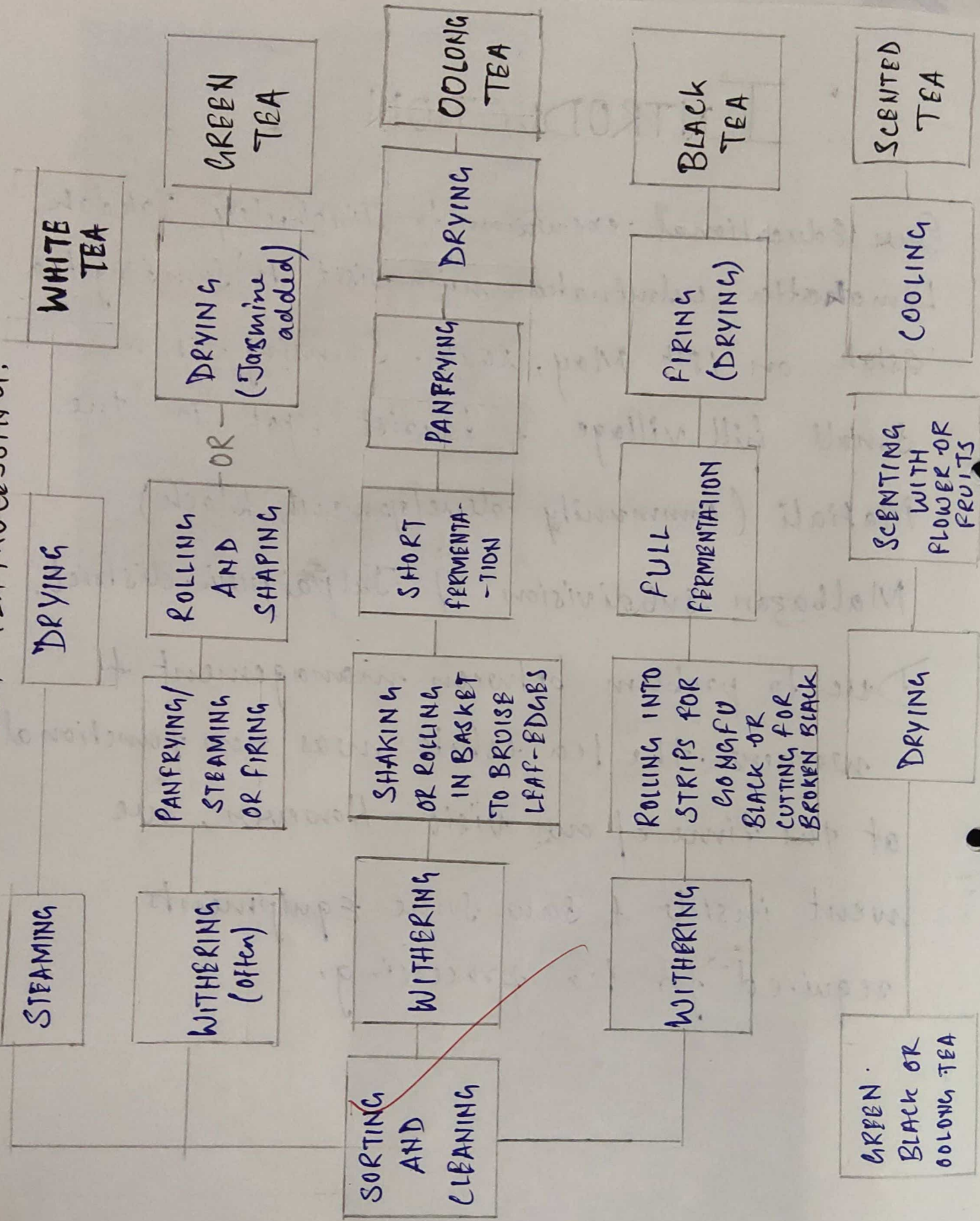
INTRODUCTION

Our Educational excursion to Tincheley, Takdah, Lamakatta culminated with visit to 'Sam Sing Tea Estate' on 18th May, 2024. Sam Sing is a small hill village & tourist spot in the Matiali (community development block), Malbazar subdivision of Jalpaiguri district.

Due to problem between management & workers the tea estate was non functional at the time of our visit. However, we went inside & saw some equipments required for tea processing.

FLOWCHART - TEA PROCESSING.

FRESH
TEA
LEAVES



CULTIVATION OF TEA

- Tea grows best in well drained, somewhat acidic, deep friable loam or forest land rich in organic matter
- There are two methods of planting viz 'square' and 'rectangular' systems. In both the cases, pits measuring 30.4 - 45.2 cm in depth, 22.8 cm in diameter and 1.2-1.5 m apart in either direction are dug. Before planting, pits are filled with organic matter contain surface soil.
- Tea is normally propagated by seeds but propagation by means of cutting, budding etc. have been found successful.
- Tea bushes are pruned regularly.

PROCESSING OF Tea

Introduction

The most widely consumed ancient beverage is the Tea. Camellia sinensis is the botanical name of the tea plant. Processing of tea involves various steps like plucking, withering, crushing, drying, rolling and shaping of tea leaves through which the leaves are made ready for brewing.

Tea consumption was originated in ancient China and reached the European continent in the 16th century. In India, tea was cultivated in Assam in the 19th century. Chinese variety (C.s. sinensis) and Assamese variety (C.s. Assamica) are the two basic varieties of tea from ancient times. The practice of steaming fresh tea leaves and drying them for



further storage and consuming it by decocting with other herbs was followed in china

1. Tea plant

1. Conventional Teas

Harvesting or plucking

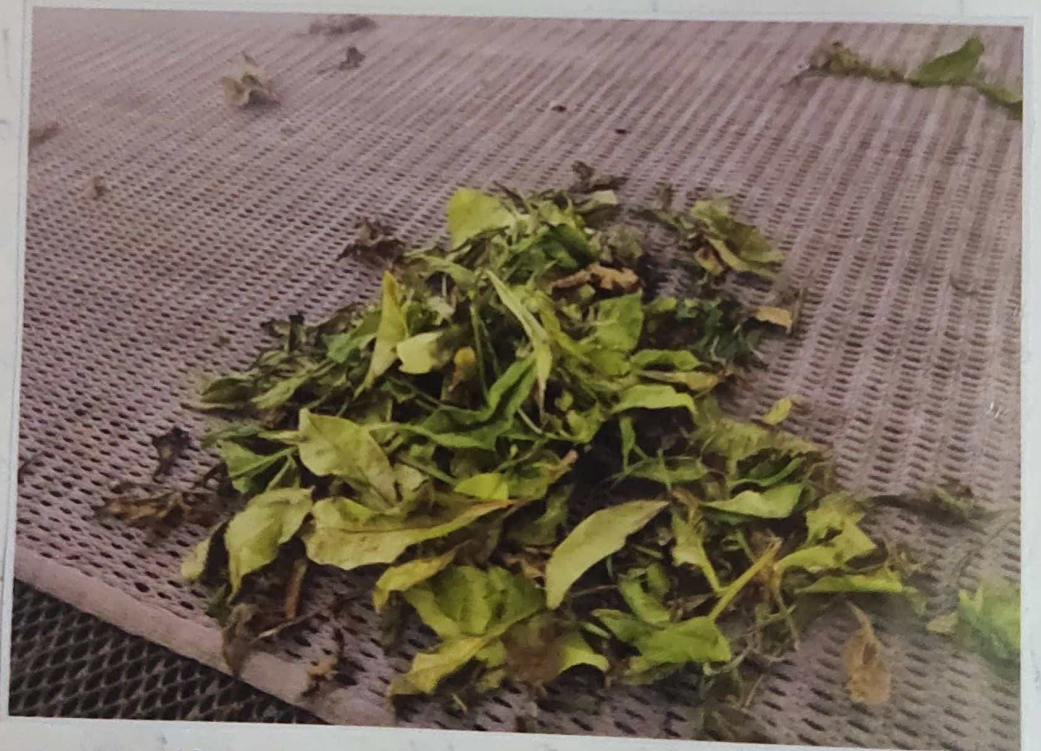
This operation is a significant step in the final quality of the tea. Usually, tender and uniform terminal bud and two sheathing leaves or only shoots with three leaves are picked from the tea plant twice a year. Manual picking is done for high quality tea and it highly depends on the skill of the picker but this is a costly method.

Mechanical picking of tea flushes and leaves are also practiced but it results in large quantities of broken leaves and partial flushes.

However, mechanical harvesting at right time can yield high quality of teas. Picking of coarse leaves is strictly avoided since it interferes in the quality of the tea.



Overview of tea factory



Withering of tea leaves

Withering

The plucked tea leaves are subjected to withering for initial removal of moisture content.

Two methods of withering are generally practiced.

Natural method of Withering

The freshly picked tea leaves are spread out in very thin layers on wire meshed racks that are arranged one above the other and further subjected to drying in natural air for a minimum period of 20 to 24 hours.

Artificial Withering

The plucked tea leaves are widely laid in 18 to 20 cm layers in table with wire meshes that are placed in a tunnel in which forced circulation of warm air mixed with fresh air takes place. This method of withering significantly causes a reduced withering time, resulting in approximately 60-62% residual moisture reducing rendering the withered tea leaves



CTC Machine



Group photo

suited for tea processing.

Breaking up

Breaking up is the process of rolling the withered tea leaves which is a pre-preparation step. This is done with the use of a circular table with a central cone with lateral slot like arrangement called batters. The top of the table is fitted with a circular jacket with a pressure cap. The table and jacket are made to rotate in opposite direction eccentrically thereby causing the withered leaves placed in the jacket to twist and roll on the surface of the cone and batters which is almost similar to manual rolling.



Samsing Tea factory



Samsing tea estate

CTC Method (Crushing, Tearing & curling)

CTC machine comprises of two metal rollers that are separated but placed with minimum distance between each other that revolves at unequal speeds. This movements cuts, tears and twists the withered and broken up tea leaves. As a result the juice from the tea leaves are pressed to the surface of the leaves, which initiates the fermentation process.

Fermentation

During fermentation the oxidation process which had began rolling is continued. Fermentation takes place in separate fermentation rooms which need to be kept extremely clean to avoid bacterial infection of the tea.

The tea leaves are placed in 3.5-7.5 cm layers on aluminium trays. The thickness of the layers depends on the room temperature.



Group photo

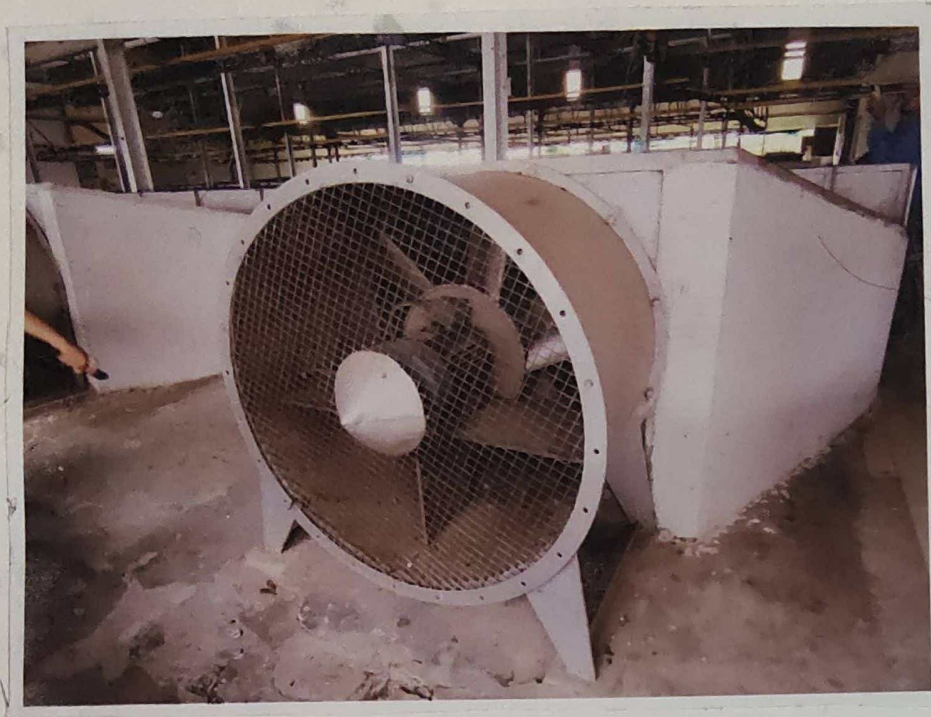
As soon as the tea has acquired a copper-red colour, the correct degree of fermentation has been reached and the process must be halted by drying.

The tannin content decreases during fermentation.

from 20% in fresh tea leaf to 10% - 12% after

fermentation. The formation of aroma compounds is caused due to oxidation of amino acid,

carotenes, and unsaturated lipids during the fermentation period.



Hot air blower



Drying or firing

The drying process carried on a 4 plates system drier. Hot air upto 90°C is blown against the leaves which should have reached 80°C by the time has been completed. I order the the polyphenol oxidize enzyme to be properly inactivated.

The moisture content should be reduced to 3.5% whereby the aroma becomes established and the leaves takes on their typical black colouration.



Grading and Storage of Fermented Tea

winnowing is practised to separate the stalky matter and grading is done by sieving, where from different grades of tea are obtained based on particle size. During the storage of finished tea products various chemical changes takes place, leading to the loss of the remaining residual greenness and roughness in 10 to 15 days period. Tea should be stored in moisture and oxygen proof area to retain the flavour and aroma developed in fermented tea. Flavour retention is possible for more than 1 year, under such storage conditions.

S. Daschowdhury
21.8.21