CHAPTER - 3
CHAPTER- 3

PREPARATION OF HAMEI

3.1. Traditional processing of Hamei

Before the scientific investigation had been carried out a thorough survey on the traditional designs and modes of Hamei fermentation was conducted. The important Hamei manufacturing sites in Manipur are some areas of valley and hills but it has been localised according to the abundancy of the specific plant yangli (Scientific name: Albizia myriophylla). The plant yangli is generally grown in the hills and the valley people get the bark of this plant through the hill people.

The preparation and fermentation of Hamei is found to be conducted in different ways, and has been adopted according to the skill of the practitioners. The traditional way of fermentation of Hamei can be broadly divided into the following ways (i) Andro type, (ii) Sekmai type, (iii) Phayeng type, (iv) Jiribam type, (v) Bishenpur type, (vi) Tengnoupal type etc. Not only the above mentioned types there are some other types which are not so popular.

The method of preparation and ingredients for Hamei
of these types are almost similar except slight difference in shape, size and covering material during the process of fermentation. In all cases the Hamei practitioners adopted the following methods:— The improperly husked rice is soaked in water for about half an hour than spread and dried for about 15 minutes in order to remove the excess water. Then the pre-soaked rice is crushed by means of a crusher to make it powder. In the meantime the small fragments of the dried bark of yangli (Albizia myriophylla) is also soaked with small quantity of water until a brown colour is developed in the water. Then the powdered rice is mixed with the yangli fragments along with the brown liquid. The two ingredients are thoroughly mixed and made in the form of paste by adding proportionate water. From the paste so prepared, rounded and cake-like Hameis are prepared according to the convenience of the practitioners. The rounded cake like Hameis are spread on the floor which are already spread with thick layers of husk or straw or sack. After properly spread, the Hameis are covered with thick layers of husk straw or sack.

The completion in the process of fermentation is signalled when it releases a characteristic alcoholic
smell. Then such Hameis are spread in the open air for a few minutes and this (Hamei) may be used for the preparation of local liquor.

Generally, the Andro type of Hamei is broader and thinner than the others. The covering materials used are mostly husk and straw.

The Phayeng type and Sekmai type is associated with the production of dirty white or brownish colour. Hamei while the Andro type is whiter. Spoilage of the whole mash is also observed during the fermentation of the different types of Hamei. Browning and spoilage during the fermentation of Sauerkraut and Pickles were also reported (Prescott & Dunn, 1959 and Wasthoff, 1978). The improved method of Hamei preparation for commercial utilization is still poor. No scientific trained persons are involved in the process so far. The traditional practitioners believed that the good result of the process of Hamei fermentation depends on Hamei goddess. And they said that if a drop of sweat falls on the ingredients of Hamei, the whole mass would be spoiled.

Not only in Manipur this fermented food stuff i.e. Hamei is prepared in other states like Arunachal Pradesh,
Mizoram, Tripura and some parts of Assam. The detailed procedure and different most of preparation in the above states is given in Chapter 13.

Thus, this type of food stuff is used by the natives of this state and neighbouring states also. If this Hamei can be used in right way it may help in increasing the economy of this state. But the qualities of this food stuff will be determined by elaborate scientific studies of this local food stuff (Hamei).
Hamel collected from Phayeng

Hamel collected from Andro
Albizia myriopyllea plant
Albizia myriophylla plant growing intermixing with other plants at Nongmaijing hill.
*Albizia myriophylla* plant showing climbing stem
Dried barks of Yangli (*Albizia myriophylla*) in bundle
CHAPTER - 3.2

IMPROVE METHOD OF HAMEI FERMENTATION

The modification of traditional technique of Hamei fermentation is almost necessary for studying the various chemical and microbial changes during the fermentation. The periodic studies during the course of fermentation is also suitable only when the traditional technique have been modified. The traditional method of Hamei fermentation is always associated with many leakage. According to Kubodinow et al 1984, the fermentation which permits leakage is unscientific method and exposure of the fermenting mash to air is easily susceptible to spoilage (Frazier and Westhoff, 1978). The addition of fresh mash in the fermenting mash in the traditional method cannot be adopted for periodic studies of by products of microorganism. Moreover, the periodic changes in the levels of the metabolites cannot be conveniently studied.

The fermentation of crops and vegetables was carried out by the combined and sequential activities of the micro-organism. (Prescott and Dunn 1959, Stamer et al 1971, Okada et al 1976. Frazier and Westhoff 1978, Yildiza
and Wehoff 1981 and Knop 1984. Sawerkrit had also been prepared with spontaneous activities of the native microflora of the raw material (Pederson 1931).

The fermentation of Hamei is also known to be caused spontaneously with the activities of the native microflora of the raw materials.

By discussing some of the above view, it has been learnt that the Laboratory scale fermentation for curing and fermentation of rice powdered and Yangli (Albizia myriophylla) fragment into Hamei, should be accompanied with reliable modification of the traditional techniques. The Laboratory design that will be convenient for the various studies on fermentation consists of the following method.

**MATERIALS AND METHOD**

First of all the pre soaked rice is crushed with a crusher (grinder) and made in the form of powder. The already dried Yangli barks are cut into small pieces and it is also crushed with a crusher. The 2 materials are mixed in appropriate proportion and water is added to the mixture to form the mixture into a paste. From the paste so prepared we made small rounded cakes of size 8 x 2 cm and put into the fermentation chamber which was already
designed for the convenience of the analysis following the course of fermentation. The wooden chamber had 4 feet in breadth and 5 feet in length and a height of 2 feet. The chamber was divided into 30 sub-chambers. Each sub-chamber could hold one round cake. The upper wooden cover was made movable through the applicable of hinges on one side.

The round cakes so prepared is put into the sub-chamber lined with polythene paper. The sub-chambers were made leak proof. The upper surface of the packed mash was sealed with folding and twisting with the Polythene paper. The packed bags were than pressed from the upper side properly by heavy things and kept protected from the outer environment. The upper surface of the chamber was closed and the packed mash were aged at room temperature (Maximum 27°C, Minimum 24°C)

The Laboratory method thus developed had been tested for various changes during the fermentation.

DEVELOPMENT OF HAMEI FLAVOUR DURING AGING

Aging was a means for the development of desirable flavour of the fermented mass. Quantity improvement of Hamei through Aging has been learnt from traditional ways of undertakings. This might be co-related with the increasing accumulation of flavouring agents. The
important flavouring agents were diacetyl, volatile phenols and esters (Prescott and Dunn 1959, Lehtonen 1982, Koifumi, 1974). Aging of Hamei in traditionally process was generally practised for one year or more with quality improvement. Aging of Hamei with quality improvement might be associated with the action of Acetic acid as mycostatic agent. The cause of the quality improvement of Hamei through aging for one year lead standard with the test on the availability of sugars.

Materials of Hamei (average initial level of phenolic compound = 30.67 mg/100 g. were fermented typically as given in chapter A. Some of the samples were analysed for the contents of phenols and esters. On the completion of one month, by using the techniques given in Chapter VI (Studies on by-products formed during the fermentation of Hamei).

Aging caused the raise in the levels of $P^H$ and fall in the level of.

The formation of esters were found increased. The formation of esters by yeast during, aging was in agreement with the reports of Frazier and Westhoff (1978). The contents of volatile phenols were found increased.
(1986) Geiger and Piendl, 1976 reported the production of acetaldehyde by yeast, with the subsequent reduction of this into alcohol by alcohol dehydrogenase.

Several reports suggest the possibilities of alcohol production from various fruit processing wastes. Production of alcohol from fermented apple pomace and damaged guava or banana has been reported by E.S. Thiraj & E.R. Suresh, 1990. Production of ethanol from mixed juice of fermented guava and banana has been reported by S. Bhatt, R.S. Rana 1987. Preparation of Lager beer from Sorghum malt using three stage decoction method and 30% sucrose as adjust has been reported by Okafer & Georgina & Anicha (1986).

Other alcohols prepared from fermented sorghum on smaller scales throughout Africa include "barukutu" "Pito" or "Otika" from Nigeria, Mayek and Mosa in Kenya and Malawai, respectively and "Merisa", Bonza and "Pombe" in Sudan, Ethiopia and some parts of East Africa. In India, alcohol is produced mainly by the fermentation of diluted cane molasses by distiller yeast (A. Somi P. Taro, 1991).
The experimental results were verified by the data presented in the table II.

**TABLE - 2**

Changes in the level of Sugars Phenols and esters during the aging of fermented mash of Hamei.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Entities</th>
<th>TIME</th>
<th>One month</th>
<th>One year</th>
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<tbody>
<tr>
<td>Hamei</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Sugars</td>
<td></td>
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<tr>
<td></td>
<td>mg/100 mg</td>
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<tr>
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<td>Phenols</td>
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<td>mg/100 gm</td>
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<td>Esters</td>
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<td>8.3</td>
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<tr>
<td></td>
<td>mg/100 gm</td>
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