Traditional technology in preparing legume-based fermented foods of Orissa

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The people in Orissa, like many other States in India, have a tradition of relishing a variety of cakes, locally called *pitha*, specially prepared during various festivals and rituals. Some of these foods are produced from the fermentation of cereal-legume batters. These products include *chakuli, chhuchipatra pitha, enduri pitha, munha pitha, podo pitha* and *chitou*, which are unknown to the scientific community. All these foods are described with respect to the nature of the product, method of preparation, mode of consumption and ethnic value.

**Keywords:** Chakuli, Chhuchipatra pitha, Enduri pitha, Munha pitha, Podo pitha, Chitou, Cereal-legume fermentation, Fermented foods, Traditional foods, Orissa

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A food is considered fermented when one or more of its constituents have been acted upon by microorganisms to produce a considerably altered product acceptable for human use. Traditional or indigenous fermented foods are those popular products, that since early history have formed an integral part of the diet and that can be prepared in the household or in cottage industry using relatively simple techniques and equipment. The origins of most fermentation technologies have been lost in the mists of history. Many fermented foods are now receiving world attention for their health-promoting or disease-preventing effects. Fermentation improves pulse digestibility for humans. The process can detoxify pulses by reducing haemagglutinin, phytate, oligosaccharides and trypsin inhibitors. Other attributes are improved flavour, nutritional value, appearance and reduced cooking time. In some fermented products containing spices and salt, the keeping quality is considerably enhanced. Fermented foods provide variety in the diet. Some ethnic groups of India are economically dependent upon fermented foods. The fermentation techniques are passed on as trade secrets in the families of certain communities, a practice protected by tradition.

Cereal and food grain legumes are staple foods of the people of India. From a nutritional point of view, cereal-legume mixture foods are advantageous because of an improved balance of carbohydrates and proteins. Although several legume-based fermented foods, like *idli, dosa, dhokla, khaman, wadi, papad* and *kinema* from different parts of India have been well studied and even several of these are scaled-up, there is no documentation on similar foods, indigenous to the state of Orissa. Therefore, the objective of this study was to look for legume-based fermented foods, if any, practiced traditionally in Orissa.

**Methodology**

A survey was conducted in the villages of different districts of Orissa to obtain detailed information on the types, traditional methods of preparation, modes of consumption, shelf life and ethnic value of legume-based fermented foods used traditionally by the local people through a well-structured pre-tested proforma and by personal interview method.

**Results and discussion**

Some important steps of preparation of six different types of legume-based fermented foods traditionally practiced in Orissa are presented (Fig. 1). As all these foods are delicious and easily digestible, these are also suitable for ailing persons, pre- or post-natal women, and children. These foods, prepared and consumed by all the communities irrespective of caste and creed, are described below.

**Chakuli**

*Chakuli*, which resembles *dosa*, is a round, fried pancake. It is prepared (Fig. 2) from varying
Dewatering soaked rice through a perforated bowl

Sun-drying briefly of soaked rice

Grinding of rice

Sieving pounded rice

Grinding of blackgram

Blending of rice powder with blackgram paste

Leaving batter in a closed container to ferment

Spreading fermented batter over a hot greased plate

Fig. 1 Steps in the preparation of legume-based traditional fermented foods
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proportions of par-boiled rice (*Oryza sativa* L.) and black gram (*Phaseolus mungo* L.). A little amount of boiled rice may be added, and black gram may be substituted with juice of jackfruit (*Artocarpus heterophyllus* Lam.) or palmyra palm (*Borassus flabellifer* L.) fruit during summer. Rice is washed, soaked, de-watered (Fig.1a) and briefly sun-dried (Fig.1b). Dried rice grains are pounded (Fig.1c) in an iron or wooden mortar and sieved to obtain a fine powder (Fig.1d). Black gram is soaked until the seed coat is easily removable by applying a gentle pressure. The grains are rubbed with hands to loosen seed coats, which are allowed to float away. The black gram is then made to a smooth paste using a stone grinder (Fig.1e). The paste is beaten repeatedly by hands with a little amount of water and mixed with rice powder (Fig.1f), appropriate amount of lukewarm water and salt. The batter is left to ferment under cover (Fig.1g) for 4-5 hrs during summer (12-15 hrs during winter). The fermented batter is fried over a hot greased pan to round shaped flat cake (Fig.1h). Spices, like ginger, onion and black pepper powder are sometimes added at the time of frying.

**Chakuli** (Fig.1i) is taken as breakfast food or snacks with a variety of side dishes including *sambar*, sugar, jaggery, tea, milk, vegetable curry, mutton, or even without any side dish. Though the shelf life of chakuli is one day, they are consumed hot and fresh for optimum delicacy. It is prepared during all the festivals.

**Chhuchipatra pitha**

The preparation procedure is similar to that of chakuli in respect of making and fermenting batter. The fermented batter is flattened thin over a hot greased pan using a spatula. The fillings of grated coconut, *dahi-chhana* (curd) and sugar are taken in the centre of the pancake (Fig.1j), which is then folded, in a square shape to fry suitably (Fig.1k). It has a shelf life of two days and is usually taken without any adjunct due to its sweet taste. *Chhuchipatra pitha* is prepared during *bataosha* festival.

**Enduri pitha**

*Enduri pitha* is a steamed flavoured cake, prepared by taking the fermented batter (as done for making chakuli) in a turmeric (*Curcuma longa* L.) leaf and folding the leaf through mid-vain. It is also stuffed with coconut, *dahi-chhana* and sugar fillings. The batter-filled folded leaves are then cooked over steam. Its shelf life and mode of consumption is similar to that of *chhuchipatra pitha*. *prathama astami* is the festival during which *enduri pitha* is prepared.

**Munha pitha**

To prepare of munha pitha, par-boiled rice powder and black gram paste are mixed in the ratio of 3:1. Sugar or jaggery, minced coconut, raisins and cashew nuts may be added to the fermented batter for delicacy. Sufficient water is taken in a *handi* (large-mouthed pitcher), and a piece of cloth is tied over its mouth keeping a shallow cavity (Fig.1l). When the water starts boiling, a thick batter is poured over the cloth (Fig.1m). An empty *handi* is kept upside down over the previous one to capture the steam (Fig.1n). The continuously generated steam cooks the material, and completion of cooking is checked by inserting a sharp object through the centre of the batter mass and observing if the batter has stuck to the surface. No adherence of batter to the object indicates completion of cooking even at the centre. A good quality munha pitha becomes spongy like *idli* (Fig.1o) and it is served by cutting into pieces (Fig.1p). The shelf life of munha pitha is one day and it is taken with sugar or curry. *Munha pitha* is prepared during different festivals.
Podo pitha

During the preparation of podo pitha, fermented batter (as done for making chakuli) is mixed with minced coconut, raisins, cashew nuts and sugar. The mixture is packed using sal (Shorea robusta C.F.Gaertn.) or banana (Musa paradisiacal L.) leaf. The packets are then covered all round with hot charcoal in an earthen oven to bake in low but continuous heat for 5-10 hrs. Completion of cooking is checked as done in case of munha pitha. After preparation, the product is cut into pieces and served. Podo pitha has a shelf life of three days and is usually taken without a side dish. It is prepared during different festivals including bijoya dashami and raja festivals.

Chitou

Chitou (Fig.1q) is prepared by mixing the fermented batter (as prepared in making chakuli) with sugar and grated coconut. It is then taken in a special earthen mould or in deep bowl and covered with a lid. The junction is closed with a wet cloth and water is sprinkled intermittently. It is fried on a low heat. Although it has shelf life of one day, chitou is delicious when taken fresh and hot. Generally, it is taken with curry, sugar, curd or tea. Chitou is prepared in popular festivals, like makar sankranti and chitou-amabasa.

The production of these foods has remained a traditional village art practiced in homes in a crude manner. Due to sub-urbanization, changes in family structure, growing number of household unit and increase in mobility, there is a gradual inclination of the newer generation of these villagers towards the modern fast foods, under-estimating their own traditional foods. These traditional fermentation processes like many others in world, are complicated and time-consuming, and, hence, many of them are being replaced by industrially processed and convenience foods, often based on technology imported from industrialized countries. The unfortunate outcome of this replacement is the inevitable loss of traditional know-how and much valued resources before it is fully understood and harnessed for the future generations. Traditional processing methods are surely not ideal and there is ample scope for improvements. But, nevertheless, as these techniques developed based on trial and error through generations, they take into account all the constraints given by the environment and the culture. They can reveal the value of traditional techniques and people can be reassured about the worth of their knowledge.

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