BIOCEUTICALS IN *SINGJU*, THE TRADITIONAL SALAD FOOD OF THE MEITEIS: AN OVERVIEW

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ABSTRACT

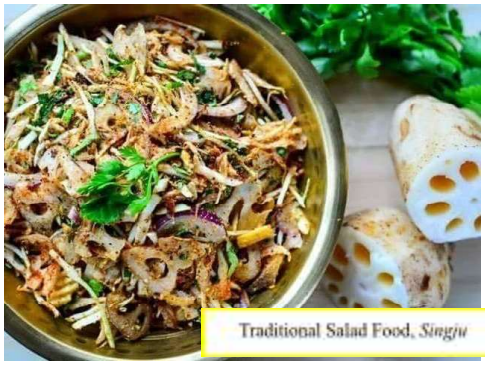
In today's world, there is a drastic change in lifestyle which spurred a global nutrition transition and immediate actions are needed to create food systems that nourish people and sustain the planet. *Singju*, the traditional salad food of the Meiteis can be one such solution which has potential benefits for the long-term nutrition, health benefits and a sustainable livelihood. Altogether, 25 (twenty five) underutilised plants used in the traditional salad *singju* have been recorded that provide benefit for health and well being that can play an important role in contributing to the livelihoods of rural and peri-urban dwellers alike. This food can bring an entire new dimension to the present food industry because *singju* contain bioceuticals that provide beneficial health and wellness effects.

Keywords: *Singju*, livelihood, bioceutical, traditional, nutrition.

INTRODUCTION

Traditional and indigenous food systems have existed for centuries and were in balance with local food supplies, globally. However, between the mid 20th and early 21st century the green revolution dramatically altered food production, which in turn affected the inclusivity of traditional production systems within food systems and subsequently traditional dietary intakes (Rebecca, 2023). Today the world faces a drastic change in lifestyle which spurred a global nutrition transition. This change was accompanied by a global *synergistic* of obesity, undernutrition and climate change. A clarion call to action to create food systems that nourish people and sustain the planet is needed. Modern food systems have evolved to a point where the cost of a healthy diet is five times greater than the cost of a diet that meets dietary energy requirements from the least costly food products, cereals (FAO *et al*, 2022). A decrease in use of traditional food systems has concerns for loss of traditional knowledge and culture. The reasons for decreased use of traditional food systems are many, but are rooted to two main reasons: (i) Climate change which makes the environment unfavourable for plants to thrive and (ii) Increase reliance on food markets for food resources by the urban and rural people.

The State of Manipur, an integral part of the Indo-Burma biodiversity hotspot, picturesquely set in the north-eastern region of India, has a history which had seen a long course of two thousand years as evident from the chronicles and manuscripts (Ch.M. Singh, 1996). It has a rich repository of plant biodiversity. The wild plants supplement a large amount of local food in Manipur. Adopting proper agro practices to conserve traditional underutilized plants would help to increase the per capita of the rural people. (S.G. Devi *et al*, 2022)


Traditional Salad Food, *Singju*

'*Singju*' the traditional salad food of the Meiteis, often eaten as a side dish is regarded as an appetizer and provide benefit for health and well being. It is an age-old tradition of the Meiteis which have been passed down from generation to generation that have hidden scientific knowledge and is still relished today with great delight. Although, the dietary diversity related to traditional and indigenous species and foods seem to be undervalued by modern food systems, some in the culinary world embrace traditional and indigenous food cultures. (Gina Kennedy *et al*, 2021). A diet containing high levels of fruits and vegetables has been associated with a lower risk of chronic diseases because in addition to their high vitamin and mineral content, these foods also contain compounds with health-protective effects. These same metabolites provide beneficial health and wellness effects in human. Traditional neutraceuticals are natural whole foods with new information about their potential health qualities. The nutritional, economic and socio-cultural potential of the neglected and underutilised plants used in the traditional salad (*singju*) of the Meiteis have yet to be fully exploited and are

suffering from a lack of research interest. Some studies on ethnomedicinal plants have been conducted in Manipur; however, there is limited information on traditional plants despite its diverse uses (Singh & Arora, 1978; B. Thongam *et al*, 2016; OA Devi *et al*, 2023). This paper proposes the long-evolved traditional salad (*singju*) of the Meiteis that amount to a treasure of knowledge that is typically overlooked and undervalued which has potential benefits for the long term nutrition, health benefits and sustainable livelihood for the rural people.

METHODOLOGY

This paper is based on secondary data available for the traditional and underutilised plants related to the traditional salad of the Meiteis, i.e. *Singju*. Data & Information from scientific papers, Google Scholar, PubMed, Science Direct, SciFinder were also employed to search for the articles relevant to each plant involved in the preparation of the traditional salad of the Meiteis, i.e. *Singju*.

MODE OF PREPARATION OF *SINGJU*

The fresh plant ingredients are finely chopped and mixed with chillies (*Capsicum frutescens*), steamed/roasted *ngari* (fermented fish), common salt, powder of fried peas and black sesame (*Perilla frustescens*) seeds. Fermented fish (*ngari*) is used for non-vegetarian dish. (S.G. Devi *et al*, 2022)

RESULT AND DISCUSSION

In the present work, we have compiled 25 (twenty five) different types of plants incorporated in the preparation of the traditional salad, *singju*. The data (Table) presents the scientific names, common names, edible parts with additional information on their bioceutical properties.

Table: Traditional plants of *Singju* with their various properties

S/N	Name of plant/common name	Edible part	Bioceutical Properties
1.	*Alocasia cucullata* (Lour.) G.Don (Chinese Taro)	Rhizome	Anti-inflammatory, Cytotoxic, Antimicrobial, Antioxidant, Antidiabetic, Anticancer, Antifungal, Antiparacytic, Antitumor
2.	*Alocasia indica* (Roxb.) Schott. (Indo-Malay Taro)	Young petiole and corm	Antidiarrheal, Antimicrobiol, Antioxidant, Antiinflammatory, Antibacterial, Antidiabetic, Anticancer, Immunoprotective, Antihypertensive
3.	*Brassica oleracea* L. (Cabbage)	Whole plant	Antioxidant, Antimicrobial, Antiinflammatory, Anti-obese, Antidiabetic, Anticancer
4.	*Cardamine hirsuta* L. (Bittercress)	Whole plant	Anti-inflammatory, Antioxidant, Antimicrobial, Antibacterial, Antidiabetic, Anticancer, Antimutagenic, Neuroprotective
5.	*Carica papaya* L. (Papaya)	Unripe fruit	Antioxidant, Antibacterial, Antiviral, Anti-inflammatory, Antiallergic, Anticancer, Antimicrobial, Antioxidant, Anticoagulent
6.	*Cycas pectinata* Buch-Ham (Sago Palm)	Young shoot	Antioxidant, anti-inflammatory, Thrombolytic, Anxiolytic, Analgesic, Antidiarrheal, Antimicrobial
7.	*Euryale ferox* Satisb (Prickly water lily)	Seeds and stem	Anticancer, Antidiabetes, Antitumor, Antibacterial, Antioxidant, Antiviral, Antiinflammatory, Antifatigue, Antidepressant
8.	*Leucaena leucocephala* (Lam.) de Wit. (Wild Tamarind)	Fruit	Antioxidant, Anticancer, Antibacterial, Antidiabetic, Anti-inflammatory, Hepatoprotective, Hypolipidemic
9.	*Ludwigia adscendens* (L.) H. Hara (Water primrose)	Young shoots	Antidiabetic, Hepatoprotective, Cytotoxic, Antioxidant, Antibacterial, Antimicrobial, Anticancer, Anti-inflammatory
10.	*Meriandra bengalensis* (J. Koenig ex Roxb.) Benth. (Bengal Sage)	Inflorescence & leaves	Cytotoxic, Antibacterial, Antioxidative, Antirheumatic, Antidiabetic, Antimalaria

11.	*Meyna spinosa* Roxb. Ex Link. (Voavanga)	Leaves	Antiallergy, Anticancer, Hepatoprotective, Antimicrobial, Antioxidant, Antidiabetic, Cytotoxic, Abortifacient, Nephroprotective
12.	*Musa* spp. (Banana plant)	Flower, Fleshy stalks	Antioxidant, Anti-diabetic, Anti-diarrheal, Antitumor, Antimutagenic, Antiulcerogenic
13.	*Nelumbo nucifera* Gaertn. (Sacred lotus)	Young leaves, stem	Antioxidant, Antibacterial, Antiviral, Antifungal, Antidiabetic, Antiaging, Antifertility, Antidiarrheal, Anticancer, Antipyretic, Antiamnestic, Antiinflammatory
14.	*Neptunia oleracea* Lour. (Water mimosa)	Young shoot	Antitumor, Antioxidant, Antibacterial, Antidiarrhoea, Antiepilepsy, Antisyphilis, Antiallergic
15.	*Nymphaea alba* Linn (White water lily)	Petioles & flowers	Antioxidant, antiinflammatory,Cytotoxic, Anxiolytic, Antimicrobial, Antiseptic, Anticarcinogenic, Antidepressant
16.	*Nynphaea nouchali* Burm.f. (Blue water lily)	Stem	Antimicrobial, Antioxidant, Cytotoxic, Anticancer, Antiparasitic, Anticonvulsant
17.	*Oenanthe javanica* (Bhume) DC (Water celery)	Leaf, stem	Antioxidant, Antiviral, Anticancer, Anticoagulant, Antifatigue, Anti-inflammatory, Hepatoprotective, Neuroprotective
18.	*Parkia javanica* Merr (Tree bean)	Flowers & fruit	Anticancer, Cytotoxic, Anti-oxidative, Anticancer, Antihypertensive, Antiinflammatory, Antimicrobial
19.	*Pisum sativum* L. (Green pea)	Leaves, Pods (Seeds)	Antioxidant, Antimicrobial, Anticancer, Antidiabetic, Antiosteoporosis, Antiinflammatory, Anti-fatigue, Antihypertensive
20.	*Psophocarpus tetragonolobus* (L.) DC. (Star bean)	Immature pods	Antioxidant, Cytotoxic, Antiinflammatory, Antinociceptive, Antifungal, Antibacterial, Antiproliferative
21.	*Sesbania sesban* (L) Merr (Egyptian Pea)	Young leaves	Antioxidant, Antiviral, Antimicrobial, Anthelmintic, Antifertilit, Antiinflammatory, Antidiabetic, Anticancer, Antianxiety
22.	*Trapa natans* L. (Water chestnut)	Petioles	Hepatoprotective, Antiinflammatory, Antimicrobial, Antidiabetic, Antifungal, Anthelmintic
23.	*Viola pilosa* Blume (Smooth-Leaf White Violet)	Whole plant	Antibacterial, Antiviral, Antioxidant, Anticancer, Anti-inflammatory, Antitumor, Antipyretic, Antiasthmatic
24.	*Wendlandia glabrata* OC (Climbing Hampweed)	Inflorescence	Antidiabetic, Antiobesity, Anticancer, Antihyperglycemic
25.	*Xanthoxylum acanthopodium* DC (Indian Prickly ash)	Inflorescence	Antibacterial, Antimicrobial, Antioxidant, Antiinflammatory, Cytotoxic, Cardioprotective, Hepatoprotective, Nephroprotective

Reference(s): Dayar Arbain *et al*, 2022; AK N Husna *et al*, 2023; Than Ninh Le *et al*, 2020; Sisay Awoke, 2021; AT Prasetya *et al*, 2018; Md Nouman *et al*, 2021; AM Tareq *et al*, 2020; Jiahui Jiang *et al*, 2023; Zayed & Samling, 2016; MM Baky *et al*, 2022; Daina *et al*, 2022; Sen & Chakraborty, 2017; Payal Kumari, 2023; Anupam Bishayee *et al*, 2022; Romesh & Singh, 2017; Agnihotri S *et al*, 2020; RO Baker *et al*, 2016; AL Abelti *et al*, 2023; Chuan-li Lu and Xiu-fen Li, 2019; Khangembam *et al*, 2018; Ding-Tao Wu *et al*, 2023; Xiumei Han *et al*, 2023; Hussein B. *et al*, 2020; S.M. Abgelgawad *et al*, 2023; RC Corovic *et al*, 2021; Rishabh Kaundal *et al*, 2022; Yunus Sheikh *et al*, 2019; Adrian *et al*, 2023; Wijaya *et al*, 2019

CONCLUSION

The food system of the Meitei community has long been associated with a rich biodiversity of varied wild and traditional plants as traditional food and in some special circumstances these foods are also used for nutritional and medicinal purposes. The traditional food like *singju* offers considerable potential for stimulating development in the food industry in light of their low cost, scalability, minimal energy and insfrastructural requirements. An entire new dimension can be brought to the present food indusry and create future by providing nutritional rich and medicinally enhanced food and products that are cost-effective, cultural and environmentally friendly. *Singju* of the Meiteis are rich with potential for policymakers, researchers and others who are associated with livelihood programmes, public health and nutritional intervention programmes, strategies for agricultural and food based start-ups, industries and innovative enterprises based on traditional food products.

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