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RESEARCH ARTICLE

PHYTOCHEMICAL SCREENING OF SELECTED TWELVE MEDICINAL PLANTS COMMONLY USED AS SPICES AND CONDIMENTS IN MANIPUR, NORTH-EAST INDIA

¹Kheroda Devi, M., ^{1*}Thangjam, I., ¹Nimai Singh, W. and ²Robindro Singh, W.

¹Institutional Level Biotech Hub, Department of Biotechnology, Kamakhya Pemton College, Hiyangthang, Manipur

²Institutional Level Biotech Hub, Department of Biotechnology, S.K.Women's College, Nambol, Manipur

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ABSTRACT

The present field survey revealed that an extensive study of spices and condiments in Imphal west district Manipur. Medicinal plants possess primary and secondary metabolites which play important roles to cure disease different ailments and also play an important role in healing. Commercially, phytochemical analysis of the plants is very important for the production of new drugs for curing various diseases. Out of the twelve plants, *Alternanthera philoxeroides*, *Cinnamomum tamala*, *Citrus latipes* show the negative results for the presence of saponins. The remaining nine species give the positive results of the entire phytochemical test except saponins. Spice yielding plants are also for manufacturing of perfumes and incenses in cosmetic industry. As the use of spices is increasing their economic importance is also increasing. So, more production of spices in Manipur is needed.

Key words: Spices, Condiments, aromatic, antibiotic, phytochemical.

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INTRODUCTION

Spices are plants products having an aromatic or pungent vegetable substances used to flavor food and food products. Spices give agreeable aroma and flavor to food and add greatly to the pleasure of eating. But spices cannot be ranked as food because, they contain little nutritive value. However, they stimulate the appetite and increase the flow of the digestive juices. Majority of them contains essential- oils and other aromatic principles. Apart from the term Spices – condiments –Seasoning; Sauce; that which is used to give relish to meat or other food. A condiment is a substance applied to food, usually in the form of a garnish, powder, or spread, to enhance or condiments are typically smeared with knives, squirted or sprinkled onto other foods. Today, the word is broadly applied to a variety of foods, including spices, herbs, saucer, seasonings, flavorings, colorings, and even beverages, such as tea, coffee and alcoholic drinks. Condiments may be classified into five non-exclusive categories, viz, salt sugar, pickled, spicy and salsa. Spices and condiments are products of plants, which are mostly used for seasoning flavoring and drugs (Parry, 1969; Dziezak,1989; Manandhar,1995). The knowledge and used of plants as species and condiments is as old as the history of mankind. Plants used as Spices and condiments are usually aromatic and pungent (Achinewu et.al.1995) had reported that these plants owe these properties to the presence of varying types of essential oils.

Spices are also used in medicine, pharmaceutical, perfumery, cosmetics and several other industries. Spices may comprise of different plant components parts. Species possess antioxidant, antimicrobial and antibiotics activities. Spices are used as therapeutical activities such as diuretic, antiseptic, antihelmintic, stimulant, analgesics and carminative etc. Many researchers have reported biochemical studies of aromatic spices through the world. Thus, the present study deals with the preliminary screening based on phytochemical tests of selected twelve spices and condiments. All these important physiological and medicinal aspects of spices and condiments deserve our serious consideration and further through probes wherever necessary. The main objective of our research work was to document for aromatic (spices) plants found in Imphal west district and analysis the presence or absence of different bioactive secondary metabolites in the selected aromatic (spices) plants.

MATERIALS AND METHODS

An intensive study of spices and condiments was carried out in the different areas of Imphal West district. The present paper was based on the spices and condiments used by the indigenous group of communities of Manipur their identification, categorization with locally available materials. Information on the spices and condiments and its products were collected from well-known village headman, many traditional healers regarding the utilities of plants as Spices through interaction.

*Corresponding author: Thangjam, I.,
Institutional Level Biotech Hub, Department of Biotechnology, Kamakhya Pemton College, Hiyangthang, Manipur

Table 1. Preliminary phytochemical tests for methanolic plant extracts

Phytoconstituents	Test	Observation
Phenols	(a) 1ml extract+a few drops of lead acetate solution(10%) (b) 1ml extract+few drop FeCl ₃	Yellow precipitation Dark green colouration
Flavonoids	1ml extract +2ml Pb(OA) ₄ (10%)	Yellow coloration
Terpenoids	2ml extract +2ml (CH ₃ CO) ₂ O + 2-3 drops conc.H ₂ SO ₄	Deep red coloration
Saponins (Foam Test)	(a) 5ml extract+5ml H ₂ O+heat (b) 5ml extract+Olive oil (few drops)	Froth appears Emulsion forms
Steroids(Salkowski Test)	2ml extract +2ml CHCl ₃ +2ml H ₂ SO ₄ (conc.)	Reddish brown ring at the junction
Glycosides (Liebermann's Test)	2ml extract +2ml CHCl ₃ +2ml CH ₃ COOH	Violet to blue to green coloration
Alkaloids(Hager's Test)	2ml extract+few drops of Hager's reagent	Yellow precipitation

Table 2. Preliminary phytochemical constituents of twelve aromatic (spices) plants

Plant name	Alkaloid	Phenol	Flavonoid	Saponin	Glycoside	Steroid	Terpenoid
<i>Alpinia galanga</i>	+	+	+	+	+	+	+
<i>Alternanthera philoxeroides</i>	+	+	+	-	+	+	+
<i>Amomum aromaticum</i>	+	+	+	+	+	+	+
<i>Cinnamomum tamala</i>	+	+	+	-	+	+	+
<i>Citrus latipes</i>	+	+	+	-	+	+	+
<i>Curcuma angustifolia</i>	+	+	+	+	+	+	+
<i>Curcuma caesia</i>	+	+	+	+	+	+	+
<i>Elsholtzia balanda</i>	+	+	+	+	+	+	+
<i>Eryngium foetidum</i>	+	+	+	+	+	+	+
<i>Hedychium marginatum</i>	+	+	+	+	+	+	+
<i>Hedychium coronarium</i>	+	+	+	+	+	+	+
<i>Houttuynia cordata</i>	+	+	+	+	+	+	+

Voucher specimens were collected from the natural habitat as well as from the markets and maintained were followed for correct identification and nomenclature (Sinha, 1986; Brown, 1969; Brickell, 1993; Vedaja, 1988).

Plant extract and solvent extraction: The 12 selected plant species were washed under tap water, air dried, rinsed with distilled water and ground into powder form method. The plant samples were shaded; air dried for one week and evaporated water molecules under hot air oven at a temperature of 35⁰C- 40⁰C for 2-4 days. The dried leaves were ground into powder form by using grinder and stored in polythene bags for chemical analysis. Crude plant extract was prepared by Soxhlet extraction.

Phytochemical tests: Preliminary screening of all the twelve plant extracts for various phytochemical constituents were carried out using standard methods (Yadav *et al.*, 2011; Aiyegororo, 2010; Harbone, 1973; Manjulika *et al.*, 2014).

RESULTS AND DISCUSSIONS

In the present investigation, the phytochemical analysis of selected twelve plants have shown the presence of alkaloids, phenols, flavonoids, glycosides, steroid and terpenoid. These secondary metabolites possess biological activities of plants such as hypoglycemic, antidiabetic, antioxidant, antimicrobial, anti-inflammatory, anticancer, antimalaria activities etc. (Negi *et al.*, 2011). Flavonoids are present in all selected twelve medicinal plants as a potent antioxidant, which possess good source of anticancer activity and also have strong induced oxidative stress for managing diabetes (Rio *et al.*, 1997; Salah *et al.*, 1995). Bioactive compound terpenoids are also strong known possess antimicrobial, anti-inflammatory and immunomodulatory properties (Rabi, 2009; Wagner, 2003) and have strong insecticidal properties (Sultana *et al.*, 2008). Alkaloids show a good phytochemical which affects as diuretic (Setchell *et al.*, 1999).

Alternanthera philoxeroides, *Cinnamomum tamala*, *Citrus latipes* show the negative results for the presence of saponins. Some researchers reported that saponins are the unique property of red blood coagulation (Okwu, 2004; Sodipo *et al.*, 2000). The use of these species plants to enhance the taste of foods, beverages and drugs is still needed by the communities of Manipur, because of poor socio-economic conditions. Lack of institutional support, unsustainable use, cultural changes have threatened resources and local traditional knowledge (Rajendro *et al.*, 2009). The present investigation suggested that for an urgent need to explore proper domestication research and development of rapid spices production and new good technologies. Majority of the spices are from the herbs except few which are from the trees and shrubs. In future, the production of spices is expected to be increased. On the other hand, traditional way of identification even causes error in some case, if the spices are morphologically similar. Therefore molecular level of identification with phylogenetic studies, antioxidant activities are required. So, conservation of spices and condiment plants are needed in the Manipur Valley.

Conclusion

In the present comparative study of the phytochemical analysis of the methanolic extract of all the twelve plants almost showed the positive results of the bioactive compounds except in three different plant species. Important active medicinal constituents such as alkaloids, phenols, flavonoids, steroids, terpenoid and glycosides were present in the samples. The medicinal bioactive compounds which are very helpful for the manufacturing of new drugs. The present studied and previous preliminary phytochemical screening showed nearly the similar results due to the presence of the phytochemical compounds. The phytochemical analysis of the medicinal plants have commercial interest in both research and manufacturing of the new drugs for treatment of various diseases.

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