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Antimicrobial and Analgesic Activity of Few Traditional Dishes of Tribal People of Tripura, India

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Food is composed of many substances, or nutrients, that are essential for various processes in the body. Edible vegetables and fruits are indispensable for our food because of their nutritional and therapeutic value. A few traditional dishes of tribal people of Tripura were prepared namely *Kharpani*, *Godak*, and *Bangui*. The extracts of these preparations were screened for antibacterial, antifungal and analgesic activity. It was found that the extracts of prepared three dishes showed significant antibacterial and antifungal activity but analgesic activity was showed by *Kharpani* extract only.

Key words: Traditional dishes, Antibacterial activity, Antifungal activity, Analgesic activity.

The aim of the present study is to evaluating the antimicrobial, antifungal and analgesic activities of the extracts of three different recipes namely *Kharpani*, *Godak*, and *Bangui* used by the tribal people of Tripura. To our knowledge, this is the first report to demonstrate such activity of few traditional dishes of tribal people of Tripura.

Food is composed of many substances, or nutrients, that are essential for various processes in the body. Edible vegetables and fruits are indispensable for our food because of their nutritional and therapeutic value. A meal without vegetables and fruits would be very dull indeed. The vegetables includes those plant parts like leaves, roots, tubers, bulbs, flowers, stems, seeds and shoots etc. that are served raw or cooked as a part of a meal. These vegetables provide variable sources of vitamins, and minerals. They have low fat and protein content and have fair amount of caloric value but have high water content. Carbohydrate is present as starch, sugars, and cellulose substances. Vegetables are normally classified into three broad groups: leafy vegetables, roots and tuber, like drumstick leaves (*Sajna bwlai*), radish (*Mulai*) etc., roots and tuber vegetables like tapioca (Thaborchuk), Sweet potato (*Jinga thaktwi*) etc. and fruits like brinjal, tomato etc., flowers like cauliflower. Drumstick etc. beans like cluster beans, shoots like bamboo shoot (*Muia*) etc. are used popularly all over Tripura (Bhakta 2004). The tribal community of Tripura uses all these vegetables as wild edible product. The art of processing food by the tribal people of Tripura by using wild edible plant products not only increases

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the taste and palatability but also enhances the digestibility, makes the food stuff soft and also helps to kill the disease causing organisms too. They use less spices for preparing their food from forest products. Sometimes, they use aromatic leaves of different wild plants for flavoring several dishes. One of the remarkable features of their food preparation process is that they use less oil in preparation of food i.e., frying the leaves and vegetables are not so popular among them. Rather, they prefer to boil steam and smoke or roast their vegetable products of the forest. The tribes of Tripura also use leaves as wrapper to scorch or roast their food. Another unique and interesting feature of tribal people of Tripura is that sometimes they use fresh bamboo culms. It was found that as a container to cook food and throw it into the live charcoal to cook the fresh bamboo helps to cook the inside food. One of the peculiarities is that almost all three recipes made by tribal people of Tripura need dry fish (Sidal) as one of the ingredients (Das 1997**)**.

In present investigation, a few traditional dishes of tribal people of Tripura were prepared. These are viz, *Kharpani*, *Godak*, and *Bangui*. The tastes of these preparations were checked by ten tribal and ten non-tribal male and female healthy volunteers. Further, these preparations were subjected for extraction by maceration/pressed method and p^H of these three extracts were also checked. The three different extracts were then screened for antimicrobial and analgesic activity with the aim to evaluate their therapeutic values.

MATERIAL AND METHODS

Preparation status of different recipes of the tribal people of Tripura was collected giving stress on Tripuri tribal. Vegetables were collected as wild edible plants for preparation of dishes. The p^H of the extracts was measured by using digital p^H meter, *Toshiba NIG-333*. All other chemicals used were of analytical grade.

Method of preparation of different recipes

Kharpani* or *Alkali water

To prepare this food preparation, dry leaves of bamboo, banana, sesame plant and mustard plant were burnt together and the ash of burnt leaves was taken into a basket that was kept hanging above a container. The basket is made up of bamboo which is known as '*Chekhak*'. The water was then poured drop by drop on the ash of the basket. Water trickles down after washing the ash into the container placed below. The same process of pouring water was repeated until the water collected into the container placed below. Clear water from the container was decanted and it is used as alkali water or *Kharpani* (Das 1997).

Gudak* or *Thamsa peimie

For this special dish (Das 1997), a hollow internoes of fresh bamboo with one side open was used. Vegetables like radish (*Mulai*), bamboo shoot (*Muia*), *Muikhon*, *Chichiri*, *Pachak*, *Dagardoma*, Mushroom, Potato (*Alu*) etc. were cut into small pieces and were mixed properly with dry fish, green chilies, chopped, onion and salt, but without oil. The mixture was then put inside the hollow bamboo, the open end of which was kept closed with banana or turmeric leaves. The filled bamboo was put inside the burning charcoal to boil the ingredients. Finally, a uniform paste was made by repeatedly driving a suitable bamboo stick inside the bamboo.

Bangui* or *Bangui Pitha

First the Binny rice was kept in water for few hours and then washed with water. Ground nuts, chopped ginger, ghee etc. were mixed thoroughly with the rice. Then a *Bungui* leaf was taken and made it into a conical shape. The mixed rice was kept into this pack, then lopped the pack and tied with fine bamboo cane. Thus several packets were made and kept into a container which was again kept upon a comparatively big container, filled up with water. Finally, the water was boiled and steamed the *Bangui* pack. Thus *Bangui Pitha* was prepared (Tripura & Debbarma 2007).

Preparation of extract:

The food preparations were further subjected for extraction by pressed/maceration method. The p^H of three different liquid extract of *Kharpani*, *Godak*, and *Bangui* was found to be 9.3, 5.5, and 5.9 respectively.

Antimicrobial study

Antibacterial activity

The *in vitro* antibacterial activity for the extracts was determined by disc diffusion method by measuring zone of inhibition in mm (Pelczar 1993). All the extracts with standard tetracycline were screened for antibacterial activity against bacterial strains *Bacillus pertusis*, *Staphylococcus*

aureus, *Escherichia coli*, and *Vibrio cholerae* at a concentration of 200 µg/ml. DMF was used as solvent control and nutrient agar was used as culture medium. The results obtained are depicted in Table 1.

Antifungal activity

The *in vitro* antifungal activity of extracts against fungal strain like *Candida albicans* was carried out employing agar disc diffusion method. All the extracts with standard Amphotericin-B were treated at a concentration of 200 µg/ml in DMF. The results obtained are given in Table 1.

Analgesic activity by acetic acid induced Writhing method

Adult albino Swiss mice weighing between 18-25 g were used for the study. The animals were divided into five groups of six animals in each. DMF were used as vehicle. First group served as control which received only vehicle in 2 ml per kg body wt. through intra peritoneal injection. Second group received aspirin (reference standard) dissolved in DMF at a dose of 100 mg/ kg body wt. by intra peritoneal injection. Third, Fourth, and Fifth groups received three different extracts diluted in DMF at a dose of 100 mg/ kg body wt. respectively.

After a gap of 30 minutes of the administration of the test extracts all the groups of mice were given the writhing agent, 3% aqueous acetic acid at a dose of 2 ml/kg body wt by intraperitoneal injection. The writhing produced in these animals was counted for 30 minutes and percentage protections were recorded (Withkin 1961).

Analgesic activity data are summarized in Table 2.

RESULTS AND DISCUSSION

The taste of prepared dishes was checked by healthy male and female volunteers. The taste was appreciable by the ten tribal and non-tribal male and female volunteers. Further, the extracts were checked for their p^H and the values were found to be 9.3, 5.5, and 5.9 for *Kharpani*, *Godak* and *Bangui* respectively.

The study was aimed at evaluating the antimicrobial and analgesic activities of the extracts of three different recipes. The results obtained for antimicrobial activities (Table 1) of these extracts showed that *Kharpani* was more active against *Vibrio cholerae* as compared to the standard drug, tetracyclin. *Kharpani* again showed activity against *Candida albicans* nearer to Amphotericin B. *Godak* also showed activity against microbes but not at per to standard drug. Bangui showed activity against *Bordetella pertusis* nearer to the activity of Tetracycline.

In the study of analgesic activity (Table 2) it was found that *Kharpani* showed activity considerably nearer to the standard drug, Aspirin. *Bangui* showed no activity. But it was recorded that *Godak* was able to create pain rather to showing the analgesic activity.

Keeping this in mind one can easily interpret that food items (recipes) used by tribal people of Tripura, have certain therapeutic values which need more exploration. Thus further research on food practices of tribal people of Tripura and their nutritional and therapeutic evaluations is to be continued.

Table 1. Antibacterial and antifungal activities of different recipes

Extracts/ Drugs	*Bordetella pertusis*	*Staphylococcus aureus*	*Eschericia coli*	*Vibrio cholerae*	*Candia albicans*
Control[@]	0	0	0	0	0
Tetracycline	24	23	25	2	-
Amphotericin –B	-	-	-	-	18
Kharpani	09	10	14	27	15
Godak	10	08	15	-	12
Bangui	18	-	14	-	10

[#] Concentration : 200 µg/ml; [@] DMF

-: No activity zone 0: No inhibition zone

Table 2. Analgesic activity of extracts of different recipes

Group	Extracts /Drugs	Dose	Mean of writhing	Decrease in writhing (% protection)
I	Control (DMF)	-	57.8	0
II	Stanard (aspirin)	100 mg/kg	13.2	77.16
III	*Kharpani*	100 mg/kg	21.0	63.66
IV	*Godak*	100 mg/kg	61.0	-5.54
V	*Bangui*	100 mg/kg	57.6	0.35

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