

## **BIODIVERSITY AND BIOCHEMICAL COMPOSITION OF SOME ANIMALS USED IN TRADITIONAL MEDICINE IN MANIPUR**

**K. KHAMBA SINGH, R.K. GAMBHIR SINGH\* AND O. GOGEN SINGH**  
DEPTT. OF BIOCHEMISTRY, MANIPUR COLLEGE, IMPHAL-795 001, INDIA.  
DEPARTMENT OF LIFE SCIENCES, MANIPUR UNIVERSITY,  
CANCHIPUR-795 003, INDIA\*.  
(e-mail : khambadr@rediffmail.com)

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The present study deals with the traditional uses of 10 animal species for treatment of human ailment practiced by Meitei community of Manipur. In this regard, chemical composition of the animals indigenous to Manipur for constituents *viz.* soluble protein, lipid, soluble carbohydrate, ash, calcium, iron, sodium and potassium has been displayed with narration of their ethnomedicozoology in practice. While these animals were noted to be used in traditional preparation of medicine for curing different ailments, their biochemical composition was found to be varied widely. This might have relation with the application of these animals in curing different ailments. Most of these animals have been consumed as food and thus they have great potential in nutrition, economy and medicine.

**Key words :** Ethnomedicozoology, traditional medicine, protein, lipid, carbohydrate and minerals.

### **INTRODUCTION**

Meitic community has been practicing the traditional method of healing human diseases and ailments from the time immemorial using animal and its products. Although the practice of using traditional drugs and folk medicine system has been greatly denounced, with the advent of modern allopathic system of medicine, this system of treatment is still practicing among the individuals of Meitei community inhabiting in the remote areas of the state, where the modern medical facilities are lacking.

Ethnomedicozoology has now become a newly emerging discipline of Bioscience which has its foundation in Zoology a basic branch of Natural science. Although the impact of ethnomedicozoology towards the human cause is underestimated, its vital role towards the betterment of human welfare and especially of its role in the alleviation of human disease is more or less universally accepted. Perhaps, the people consume animals as tasteful and protein rich food without understanding their medicinal importance. Moreover, the discipline ethnomedicozoology has scope with certain animals which have not been usually consumed as food. There is suspicion that with ever advancing and prevalent adoption of allopathic system of therapy, ethnomedicozoological practice of this community may be subdued up to total disappearance. The present study is for registering the practice of ethnomedicozoology of Meitei community based on ten animals indigenous to Manipur along with displaying of their chemical composition.

### **MATERIALS AND METHODS**

The materials were collected from every district where the Meitei communities inhabited. For collecting information, interviews were arranged through the personal contact of the elders of the localities and renowned persons to get an accurate and an

Table I : Biochemical composition of animals adopted in traditional practices of healing ailments.

S. No.	Species	Protein (mg/g)	Lipid (mg/100g)	Soluble Carbo-hydrates (mg/g)	Mois-ture (%)	Ash (%)	Calcium (mg/100g)	Iron (mg/100g)	Sodium (mg/100g)	Pota-ssium (mg/100g)
1.	<i>Clarias batrachus</i>	17.03 ± 0.06	1.46 ± 0.04	0.59 ± 0.02	81.4 ± 0.9	1.49 ± 0.05	0.080 ± 0.02	2.67 ± 0.10	40 ± 20	310 ± 15
2.	<i>Heteropneustes fossilis</i>	12.73 ± 1.06	5.03 ± 1.62	0.66 ± 0.01	76.71 ± 1.2	1.39 ± 0.02	0.240 ± 0.06	1.65 ± 0.16	100 ± 20	420 ± 5
3.	<i>Channa orientalis</i>	24.57 ± 0.06	1.41 ± 0.06	0.23 ± 0.04	74.61 ± 1.1	1.32 ± 0.04	0.240 ± 0.03	1.50 ± 0.09	130 ± 5	500 ± 10
4.	<i>Ursus arctos</i> (Gall-bladder)	14.06 ± 0.26	12.68 ± 0.33	0.22 ± 0.03	71.31 ± 1.3	1.94 ± 0.03	0.200 ± 0.04	1.40 ± 0.04	1150 ± 20	380 ± 6
5.	<i>Canis familiaris</i> (Gall-bladder)	18.00 ± 0.22	11.75 ± 0.02	0.22 ± 0.05	72.18 ± 0.8	1.25 ± 0.04	0.200 ± 0.03	1.20 ± 0.12	650 ± 10	130 ± 5
6.	<i>Periplaneta americana</i>	48.60 ± 1.20	2.96 ± 0.40	0.70 ± 0.06	46.67 ± 2.2	1.38 ± 0.06	0.240 ± 0.07	0.80 ± 0.09	1130 ± 15	420 ± 20
7.	<i>Belostoma indica</i>	36.15 ± 0.92	10.64 ± 1.02	0.15 ± 0.02	47.59 ± 1.07	1.92 ± 0.02	0.240 ± 0.01	0.85 ± 0.04	290 ± 9	380 ± 18
8.	<i>Palaemon malcolmsoni</i>	2131 ± 1.23	6.75 ± 0.44	0.45 ± 0.03	70.26 ± 0.8	1.72 ± 0.05	0.440 ± 0.05	1.45 ± 0.03	260 ± 10	340 ± 10
9.	<i>Pila species</i>	12.13 ± 0.84	933 ± 0.82	1.33 ± 0.03	72.85 ± 0.6	3.72 ± 0.09	0.561 ± 0.02	1.45 ± 0.05	80 ± 20	110 ± 8
10.	<i>Unio marginalis</i>	16.48 ± 0.55	12.26 ± 1.04	0.33 ± 0.02	70.23 ± 0.8	1.04 ± 0.01	0.280 ± 0.01	2.00 ± 0.15	120 ± 5	180 ± 6

Table II : Animals and applications in traditional healing of diseases.

Name of Animal(s)	Part(s) used	Method of Preparation	Mode of administration	Diseases/ curing property
1	2	3	4	5
<i>Clarias batrachus</i> (L.N. Ngakra) Family : Claridae	Whole body	i). The whole fish is boiled with water, little common salt and <i>Capsicum annum acuminatum</i> (L.N. Morok).	As soup, at least twice daily for ten days.	Remedy of anaemia for post partum/lactating women and as general boby tonic.
	Whole body	ii). Whole body is cooked with fresh milk	Used as tonic/ curry.	Malnourishment
<i>Heteropneustes fossilis</i> (L.N. Ngacheek) Family : Heteropneustidae	Whole body	Cooked with <i>Phlogacanthus thyrsiflorus</i> (L.N. Nongmangkha ashinba).	Used as tonic/ curry.	Anaemia, blood purifier.
<i>Channa orientalis</i> . (L.N. Ngamu) Family : Channidae	Flesh	i). The flesh is cooked with edible oil and taro.	As curry twice daily for entire post gestation period.	Remedy of anaemia for lactation and post partum/ post gestation women and as general body tonic
	Flesh	ii). The flesh is cooked with <i>Cissus adnata</i> (L.N. Kongouyen).	As a curry once a week for one month.	Abortion and amenorrhoea, remedy to urticaria and stone case (for removing stone present in the urinary tract).
	Flesh	iii). Cooked without oil with <i>Murdania rudiflora</i> (L.N. Tandan mana), <i>Curcuma domestica</i> (L.N. Yaingang), piece of pine wood (L.N. Uchan) and water	As curry twice daily for seven days.	Loss of appetite and loss of vigour and stamina.

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elaborate information regarding the mode of application, the therapeutic uses and drug derived form the animals.

The fishes for the study were brought from the Imphal market.

The carnivorous live fishes-*Clarias batrachus*, *Heteropneustes* and *Channa orientalis* were brought to the laboratory alive. The live fishes were sacrificed I mmediately after

Name of Animal(s)	Part (s) used	Method of Preparation	Mode of Administration	Diseases/ Ailments
1	2	3	4	5
	Flesh	iv). The flesh of the fish is cooked with <i>Blumea balsmifera</i> (L.N. Langthrei)	Used as curry.	Stone case.
	Tail	v). The tail of the fish is taken fresh.	Tail is applied on the region.	Helps in the opening of boils.
	Bile	vi). The bile is made into paste.	Orally given to the patient.	Small pox and Chicken pox.
<i>Ursus arctos</i> (L.N. Shawom) Family— Ursidae	Gall-bladder	i). Gall bladder is mixed with either honey or sugar cane juice.	The mixture is used as tonic twice daily for two days.	Fever (both acute and chronic). Chicken pox and worm diseases.
	Fat	ii). The fat obtained from the animal is used as medicine	The fat is applied externally on the area of injury.	Leprosy
<i>Canis familiaris</i> (L.N. Hui) Family Canidae.	Flesh	i). The flesh is cooked with water, common salt and spices.	Used once daily for seven days	Tuberculosis
	Flesh	ii). The flesh is boiled with water.	the boiled extract of the flesh is used as medicine.	Emaciation, debility and general weakness.
	Bile	iii). The bile of the animal is mixed with water.	The extract solution is orally given to the patient.	Cough asthma and tuberculosis.
	Gall-bladder	iv). The gall-bladder is mixed with the juice of <i>Gingiber officinalis</i> (L.N. Sing) and made tablet.	Used as tablet once daily for seven days.	Dog bite, Tuberculosis Malnourishment

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Name of Animal (s)	Part (s) used	Method of Preparation	Mode of Administration	Diseases/ Ailments
1	2	3	4	5
<i>Periplaneta americana</i> (L.N. Kharmi) Family- Blattellidae.	Whole body	The animal is roasted.	Orally taken two times daily for seven days.	Antidiuretic and to stop bed wetting by children.
<i>Belostoma indica</i> (L.N. Naosek) Family- Belostomatidae.	Whole body	i). The animal is roasted without oil.	Orally taken two times daily during meal for ten days.	Blood purifier.
	Whole body	ii). The animal is cooked with <i>Centella asiatica</i> (L.N. Peruk).	Used as curry.	Blood purifier.
	Whole body	iii). The animal is roasted and mixed with plantain plant (prepared as curry).	Used as curry.	Blood purifier.
	Whole body	iv). The animal is fried with mustard oil.	Orally taken as curry.	Piles and cancer.
<i>Palaemon malcolmsoni</i> (L.N. Khajing) Family— Palaemonidae	Flesh	i). the flesh of the animal is boiled with <i>Tectona grandis</i> (L.N. Chingsoo) and obtained a soup.	Used as curry.	Anaemia and to improve the circulation of blood.
	Whole body	ii). The whole body of the animal is crushed by using mortar and fanned a paste.	The paste is applied on the pain region.	Used as a remedy to wounds of the cattle (eradication of maggots).
	Whole body	iii). The animal is cooked with <i>Hibiscus esculentus</i> (L.N. Sougri ahangba) without oil.	Used as curry.	Stone case.
	Whole body	iv). The animal is made salad with tender lotus leaf, common salt, <i>Capsicum annum acuminatum</i> (L.N. Morok) and fermented fish.	Orally given to the patient as a medicine.	Diabetes.

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they were brought to the laboratory. Pieces of muscle were excised from the trunk region particularly from the area dorsal to the pectoral fins; Gall-bladders of mammals viz. *Ursus arctos* and *Canis familiaris* were taken and among invertebrates animals viz. *Pila* sp., *Unio marginalis* *Periplaneta Americana*, *Belostoma indica* and *Palaemon malcolmsoni* was taken for analyses.

Name of Animal (s)	Part (s) used	Method of Preparation	Mode of Administration	Diseases/ailments
1	2	3	4	5
<i>Pila</i> sp. (L.N. Labuktharoi) Family— <i>Viveparidae</i>	Whole body.	Cooked with a little amount of common salt, <i>Capsicum annum acuminatum</i> (L.N. Morok) and <i>Curcuma domestica</i> (L.N. Yaingang)	Used as curry once daily for one month.	As a remedy of impotency.
<i>Unio marginalis</i> (L.N. Konggreng achouba). Family— <i>Unionidae</i> .	Flesh	The flesh is fried in mustard oil with <i>Allium sativum</i> (L.N. Chanam).	Orally taken twice daily for five days.	Piles.

Moisture and Ash contents were determined by Haut and Fisher method. Total soluble protein was estimated spectrophotometrically following the method given by Plummer (1985) with BSA (Bovine serum albumin) as protein standard. Total lipids were extracted in chloroform-methanol (2:1 v/v) based on the method detailed by Plummer (1985). Total soluble sugars were estimated by the method of Dubois *et al.* (Plummer, 1985). Calcium content was estimated following the method of Indian Standard Institute (1980). Iron content was estimated by adopting a standard method. Sodium and Potassium contents were determined by Flame Photometry.

## RESULTS AND DISCUSSION

Biochemical composition of test animals, consumed mostly as food is found to be varied (Table I). Total soluble protein of the animals varied from 12.13 to 48.60 mg/g, the highest and lowest values being for *Periplaneta Americana* and *Pila* sp. respectively. Soluble protein value of *Belostoma indica* was recorded to be as high as 36.15 mg/g. The variation of lipid content was noted from 12.88 mg/100g (*Ursus arctos*) to 1.41 mg/100g (*Channa orientalis*). While the highest value of soluble carbohydrate was observed as 1.33 mg/g (*Pila* sp.), the lowest value noted was 0.15 mg/g (*Belostoma indica*). The highest moisture content was observed for *Clarias batrachus* (81.4%) and lowest being for *Periplaneta Americana* (46.67%). Highest ash value was found in *Pila* sp. (3.72%) and lowest in *Canis familiaris* (1.25%). The contents of calcium, iron, sodium and potassium were in the ranges of 0.08-0.56, 0.08-2.67, 40-1150, 110-550, respectively, all values being in mg/100g. From the data, it could be inferred that chemical composition of the animals varied significantly. This might have relation with the application of these animals as traditional curatives of different ailments as narrated in Table II. On the ground that the present study could not mention about the chemical identities of pharmacologically active agents, suggestion is put up for sooner sparing of efforts for scientific evidences. Since most of these animals have been consumed as food, it is rather concluded that they have profound potential in nutrition, economy and medicine.

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