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## Cooking methods and medicinal uses of frog species among the Naga tribes in Dimapur

**Sagarika Talukdar<sup>1</sup>, Saibal Sengupta<sup>2</sup>, Manngam Konyak<sup>1</sup>,  
Shunyei<sup>1</sup>, Md. Rizwan<sup>1</sup>**

<sup>1</sup>Department of Zoology, St. John College, Dimapur, Nagaland, India

<sup>2</sup>Department of Zoology, Assam Don Bosco University, Tapesia Campus, Sonapur Assam, India

E-mail address: [sago.beda@gmail.com](mailto:sago.beda@gmail.com)

### ABSTRACT

Amphibia is a class of vertebrate. Amphibians are ectothermic, or cold-blooded, and they have smooth skin that must stay moist to prevent desiccation. They play an important role in nature both, as predator and prey. Nagaland is one of the north eastern hilly states and it is very rich in biodiversity. Due to the geographical position, Nagaland has a huge number of amphibian fauna. Purpose of the present study is to get information of sociocultural relation of frog and Naga people and to study the diversity. Study was conducted through the market survey and interview. Interview was conducted among the people of different age groups which are belonging to different tribes. Frog species were collected from the markets and Morphometric measurements were taken by using a vernier caliper. Frog samples were kept as museum specimen. From the investigation, all together 11 species from 4 families were recorded from the market and identified with the help of relevant literature. Cooking procedure of frog meat among the people of Nagaland varies from tribe to tribe and people to people. Most common method of consumption is boiling with bamboo shoot. Naga people have traditional believe that frogs have medicinal purposes. Different body parts of the frog are consumed by different way to cure the various diseases. Frog eating is a traditional way and continued practice among the Naga society from the time of civilization to obtain the protein, and frogs are easily available in the markets in both, as fresh and dried. Frogs are being exploited from nature from year after year without having proper maintenance and conservation. The results of the study revealed that there is no reduction in frog population, though they are being collected in a huge number. It is necessary to culture the frog species and to establish socio-ecological system through a sustainable management and conservation of biodiversity.

**Keywords:** Amphibia, biodiversity, medicinal value, Nagaland, sustainable management, traditional knowledge, frog species, Naga tribes

## **1. INTRODUCTION**

Nagaland is one of the north eastern states of India. Nagaland is home to 16 major tribes, each with a distinct culture, tribal traditions and language. The people inhabited to this state are known as Naga. The Naga people are various individuals or ethnic groups associated to the North Eastern part of India and Northwestern Myanmar. The traditional faith, religious beliefs and practices of Naga tribes show sign of being animistic. In Naga culture animal protein is a staple diet. Different live animals, like frogs, birds, insects, etc. are supplied also from outside the state to the local markets. All the Naga tribes consumed frog meat on a regular basis. Frog eating is a traditional way to obtain the protein. Frogs are easily available in the markets. It is also feared that some species having huge scientific value may end up in dishes of delicacy. Despite having a species- amphibian fauna and presence of frogs in diets of people, little is known about the frogs that are in the cuisine of Naga people.

Purpose of the present study was to get information of medicinal value and cooking methods of edible frog species and also evaluate the trade of frog species in the market of Dimapur, Nagaland.

## **2. MATERIALS AND METHODS**

The study was conducted in Dimapur district of Nagaland. The market survey was conducted in different areas of Dimapur. The markets of the district were surveyed twice in a month from June 2019 to December 2019. The quantity of frogs sold and their prices were recorded. Morphometric measurement (SVL, SL, HL, etc.) taken by using vernier caliper. Frog species were identified following Boulenger (1920). Further, personal interviews were conducted among the different age groups. All together, 90 individuals were interviewed and the respondents were of various occupations and they belong to different Naga tribes. The questionnaires were prepared in nagamese language to avoid communication problems. All the interviews were conducted in the presence of field assistants speaking nagamese and also other Naga languages. They were asked about species of frogs consumed (local name), medicinal use of frogs in various ailments, and cooking method of frog meat.

## **3. RESULTS AND DISCUSSION**

Total 11 species belonging to 4 families of frogs were identified in the study. The most abundant species were *Fejervarya* and Naga people mostly consumed *Hoplobatrachus tigerinus* and *Euphlyctis cyanophlyctis*.

All the species recorded during survey are mentioned below:

**Dicroglossidae:** *Euphlyctis cyanophlyctis*, *Euphlyctis ghosi*, *Fejervarya teraiensis*, *Hoplobatrachus crassus*, *Hoplobatrachus tigerinus*

**Megophryidae:** *Megophrys major*

**Ranidae:** *Amolops species*, *Pterorana khare*

**Rhacophoridae:** *Polypedates teraiensis*, *Rhacophorus bipunctatus*, *Rhacophorus maximus*

**Table 1.** This shows the family, no. of species, scientific name and IUCN status

Family	No. of species	Scientific name	IUCN status
<b>Dicroglossidae</b>	5	<i>Euphlyctis cyanophlyctis</i>	Least concern (LC)
		<i>Euphlyctis ghosi</i>	Data deficient
		<i>Fejervarya teraiensis</i>	-
		<i>Hoplobatrachus crassus</i>	LC
		<i>Hoplobatrachus tigerinus</i>	LC
<b>Megophryidae</b>	1	<i>Megophrys major</i>	LC
<b>Ranidae</b>	2	<i>Amolops</i> species	LC
		<i>Pterorana khare</i>	LC
<b>Rhacophoridae</b>	3	<i>Polypedates teraiensis</i>	LC
		<i>Rhacophorus bipunctatus</i>	LC
		<i>Rhacophorus maximus</i>	LC

### 3. 1. Cooking methods of frog meat

Boiled: It is a common method among the people. They boiled the frog meat with different ingredients like salt, chilies, ginger and bamboo shoot which bring a good taste. But they also believed that using bamboo shoot the medicinal values are reduced. Soup: They also used as a soup, having high medicinal values. Fried: Some people even fried the frog meat with spices to increase the taste. Smoked: People also prefer to dry the meat over the fireplaces so that the frog meat becomes tastier with the fire smoked taste. This method is very common among the Zeliang tribe.

### 3. 2. Medicinal uses

The Naga peoples used frog meat for varieties of ailments like gastritis, blood lost, skin burns. Some people believed that swallowing small live frog is good to cure poisonous effects in stomach and to stop vomiting. The fresh frog meat soup is consumed to recover the blood lost. Cooked meat of frog is taken as the medicines to cure wounds and blood lost. If the person is sick, often the frog soup is consumed as it strengthens them and help in recovering the sickness faster. It is also taken as a medicine after any operation or surgery. Skin of frog is applied on burn wounds for rapid healing. It is used as a medicine for any organ injury. Frog meat is good in healing fractured bones.

#### **4. CONCLUSIONS**

Medicinal value of the frogs is of great importance among the Naga people, especially living in the remote area due to a limited availability of the medicines. Traditional knowledge of medicinal uses of frog is important to the human society and science for better understanding of traditional medicine and its relationship with socio-economic of Nagaland. In the study it was observed from the interviews and market survey revealed that all these recognized tribes consume frogs regularly. However, Kiyasetuo (1986) reported seven tribes, namely Angami, Ao, Sema, Lotha, Rengma, Chakhesang, and Zeliang, to consume frogs. Further, 100% of the interviewed population recognized had knowledge that frog's meat is a great source of protein for human. They believe that the frog meat has a medicinal importance and consume frog by different ways to cure varieties of ailments.

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