

Studies on the Consumption of eri Silkworm, *Philosamia ricini* Hutt. as Food in Nagaland

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Abstract

The purpose of rearing eri silkworm in Nagaland is mostly for its pupae which form a delicious food item for a large section of population. In the present study, survey was carried out during 2008 among the nine (9) communities in Nagaland with five (5) households selected from each community for this study. Data indicated that respondents consumed the eri worms at the pupal stage and preferred both by young and old alike and also by both the gender. Most of the respondents consumed by boiling it in bamboo shoot and also frying in oil. The study also revealed that pupae are highly in demand in the market, the rearers earned more by selling eri pupa than the cocoon. So, good market linkage through regulated market or private dealers is the need of the hour to promote eri culture in Nagaland.

1. Introduction

Silkworms provide not only silk fibre but also food to human beings. Roychoudhury and Joshi (1995) have mentioned that in some parts of India and China, the silkworm pupae are regarded as delicious food and are extensively eaten when the silk has been reeled off. It is a delicacy to tribals in some parts of North-eastern states of India. The fleshy larvae, pre-pupae and pupae of non-mulberry silkworms such as muga, tasar and eri are preferred as food by Garo, Mikir and Khasi tribes of India. They are in high demand in local markets of North-eastern states. Eri culture in Nagaland is traditionally practiced by different tribes of the state. Very often the purpose of Eri silkworm (*Philosamia ricini* Hutt.) rearing is mainly for their pupa which is a delicacy to a large section of the population (Narain, 1995). The tribals, who were consuming Eri silkworm pupae for their taste, were unknowingly consuming rich protein food material. Unlike other silkworm, Eri worms form cocoon which is open at one end. The rearers have the habit of taking out pupa from the cocoon in the pre-pupal stage and sell them which are in high demand in the local market of North Eastern states particularly in Nagaland. As Eri cocoons cannot be reeled and generally spun like cotton, the removal of pupa at pre-pupal stage not only maintains cleanliness of yarn, but also facilitates smooth spinning. In general, certain insects are

consumed as food and well known for having a nutritive value in the country especially in the North Eastern Region. Mulberry silkworm (*Bombyx mori* L) pupae are popularly consumed as a by-product from silk yarn reeling while ericulture has been in practiced in the region since time immemorial and has a close link with the traditional and socio-economic life of the people (Gogoi and Kalita, 2009).

In spite of its importance in making fabric as well as food for many years, no systematic work has been carried out on its consumption in the state of Nagaland. Hence the present study was designed to collect proper information from different communities on the nature of consumption of eri silkworm in the state of Nagaland.

2. Materials and Methods

With a view to understand the potentials and utilization of eri larva/ pupa as food in Nagaland, the present investigation was undertaken during 2008. The survey was carried out among nine (9) communities under Dimapur (Kachari), Kohima (Angami), Wokha (Lotha), Mokokchung (Ao), Mon (Konyak) and Tuensang (Chang, Khiamnungan, Sangtem & Yimchunger) districts. The selection of the respondents was done after identification from the respective District Sericulture Office, Department of Sericulture, Government of Nagaland and well



wishers. Five households/ respondents were selected from each community for this study.

The primary data was collected through personal contact method (PCM) with prescribed questionnaire during the study tenure which were duly verified and taken up for detailed analysis. Relevant tables were prepared according to communities and age wise distribution and the data thus collected were computed by using simple percentage/average method and techniques to draw some inferences in this study.

3. Result and Discussion

From the investigation, it has been drawn that all the different age group are involved in rearing of worms but was mostly carried out by the middle age group between 41-50 years old representing 33.33% of the total respondents. Since sericulture does not involve hard labour and does not require sophisticated machinery it is easy to understand and can be carried out both by young and old alike. The educational status of the respondents were represented with 15.56% illiterate, 15.56% primary school, 31.11% of middle and high school while 6.67% have studied up to college level (Table 1). Sericulture does not require sophisticated machinery and involves use of simple technologies and appliances which is easy to understand and can be adopted even by an illiterate farmer. It was observed that 86.67 per cent of the respondents consumed the eri worms at the pupal stage which is preferred both by young and old alike and also by both the genders. The study also indicated that 13.33% of the respondents prefer to eat the silkworm larvae just after cocoon formation while 86.67% likes to consume the pupae. Except the Konyak communities, all the remaining communities consumed at pupal stage (table 2). It was also observed that the cooking of eri larva/pupa varies from person to person. In table 3, it shows that 51.11% of

the respondents preferred boiled pupa, 6.67% by frying while 42.22% preferred both boiling and frying in mustard oil. In Kohima district, pupae are made into pickle which could be stored and consumed during the off season. The method for preparing eri pupae dishes depends on individual and mostly prepared by boiling with bamboo shoot, frying in mustard oil or by making pickles. To cook in bamboo shoot, the pupae are first cleaned properly and washed in hot water to which is added salt and chillies. Then, Bamboo shoots, garlic, ginger and pupae are boiled together till cooked properly. For frying, oil is spread in a frying pan to which spices like ginger, garlic, chillies, salt are added and stirred till golden brown colour is obtained. Then the pupae are added and fried. For pickle preparation, same procedure is followed as in frying, but the difference is that more spices are added and the pupae are fried till crispy which is then stored in container for future consumption during the off- season. Roychoudhury and Joshi (1995) also observed similar results that the pupae are either cooked in very hot water or roasted. So, ericulture is commonly practiced by the farmers in the state from which they earn by selling the empty cocoons as well as pupae. Eri pupae which are rich in protein are mostly utilized as a delicacy by the tribal people of Nagaland. Ao and Singh (2004) also reported that a total number of 15 insect species belonging to 13 taxa are consumed as edible insects in Mokokchung and Zunheboto districts of Nagaland in which eri silkworm was also included as edible insect. It is preferred both by young and old alike. The present findings are in confirmation with Narain (1995), Roychoudhury and Joshi (1995) who have described that the purpose of eri silkworm (*Pricini*) rearing is for pupal utilization in the form of human food. The purpose of rearing the worms varies from one another as such, 37.78% of them rear for self consumption as food while 62.22% rear it for commercial purpose. It is

Table 1: Distribution of age and Educational status of the respondents.

Communities	Distribution of age of the respondents					Educational status of sample units of the respondents				
	21-30	31-40	41-50	51-60	61-70	Illiterate	Primary School	Middle School	High School	College
Angami	-	1	4	-	-	-	2	2	1	-
Ao	-	2	1	1	1	-	1	2	2	-
Chang	4	1	-	-	-	1	-	-	3	1
Kachari	-	2	1	1	-	-	3	1	1	-
Khiamniungan	3	1	1	-	-	2	1	1	1	-
Konyak	-	1	1	2	1	1	-	2	1	1
Lotha	-	-	2	3	-	1	-	2	2	-
Sangtam	1	2	2	-	-	1	-	1	2	1
Yimchunger	-	1	3	1	-	1	-	3	1	-
Total	8	12	15	8	2	7	7	14	14	3
	(17.78%)	(26.67%)	(33.33%)	(17.78%)	(4.44%)	(15.56%)	(15.56%)	(31.11%)	(31.11%)	(6.67%)

Table 2: Preference for consumption of larva/pupa and Stages of worms consumed by the respondents

Communities	Preference for consumption of larva/pupa					Stages of worms consumed		
	Elder	Children	Both	Male	Female	Both	Larva	Pupa
Angami	-	-	5	-	-	5	-	5
Ao	-	-	5	-	-	5	-	5
Chang	-	-	5	-	-	5	1	4
Kachari	-	-	5	-	-	5	-	5
Khiamniungan	-	-	5	-	-	5	-	5
Konyak	-	-	5	-	-	5	5	-
Lotha	-	-	5	-	-	5	-	5
Sangtam	-	-	5	-	-	5	-	5
Yimchunger	-	-	5	-	-	5	-	5
Total	0.00 (0.00%)	0.00 (0.00%)	45 (100%)	0.00 (0.00%)	0.00 (0.00%)	45 (100%)	6 (13.33%)	39 (86.67%)

Table 3. Preparation of eri silkworm as food, Rearing purpose and source of market facilities for cocoon of the respondents.

Communities	Preparation of eri silkworm as food				Purpose of rearing worm		Source of market facilities for cocoon			
	Boil	Fry	Both	Pickle	Self consumption	Commercial purpose	Market	Locally utilized	Govt.	Unable to dispose
Angami	1	-	4	1	1	4	2	-	3	-
Ao	4	-	1	-	-	5	2	-	-	3
Chang	5	-	-	-	5	-	2	-	3	-
Kachari	1	1	3	-	1	4	-	4	1	-
Khiamniungan	2	-	3	-	5	-	-	4	1	-
Konyak	-	-	5	-	3	2	1	-	2	2
Lotha	3	1	1	-	-	5	5	-	-	-
Sangtam	2	1	2	-	1	4	4	1	-	-
Yimchunger	5	-	-	-	1	4	-	4	1	-
Total	23 (51.11%)	3 (6.67%)	19 (42.22%)	1 (2.22%)	17 (37.78%)	28 (62.22%)	16 (35.56%)	13 (28.89%)	11 (24.44%)	5 (11.11%)

concluded that the main purpose of rearing erisilkworm are for commercial purpose. The source of market of the products are categorized as market, locally utilized, Government and unable to dispose. It was recorded that 35.56% of the production have market outside the village, 28.89% are locally utilized, 24.44% are purchased by the Government and 11.11% are unable to dispose off. It was reported that most of the empty cocoons produced are bought by the people of Assam, Manipur and Bihar. The traders also purchase the cocoons from the rearers at door step or from weekly markets usually at thrown away prices by engaging middle men. Some utilize the cocoon for making silk shirts, jackets, shawls and mekhalas sharing their experience that making a thread is more profitable than selling off empty cocoons. The Department of sericulture, Government

of Nagaland usually buy back the empty cocoon with the departmental rate of ₹ 130/kg which does not satisfy the farmers. The farmers suggested that the rate of empty cocoon should be enhanced by the government to benefit the farmers. Some respondents from Ao and Konyak communities find it very difficult to dispose off the empty cocoons due to poor market linkage. This is in the line of conformity with the findings of Prasad and Sahu (1992) who has also reported that organized marketing system for sericulture is lacking in the North-eastern region. About 24.44% of the respondents earned more than ₹ 20,000 in a year, 20% of the respondents earned in the range of ₹ 5,000-10,000 and 48.89% of the respondents earned in the range of ₹ 1,000-5,000 (Table 4). It is evident from the present study that a significant source of income is getting

Table 4. Value of annual production and financial assistance availed from the Government.

Communities	Value of annual production				Financial assistance
	₹ 1000-5000	₹ 5000-15000	₹ 10000-15000	₹ 15000- above	
Angami	1	4	-	-	5
Ao	-	-	-	5	-
Chang	5	-	-	-	-
Kachari	1	-	-	4	5
Khiamniungan	3	2	-	-	3
Konyak	2	1	1	-	-
Lotha	-	2	1	2	-
Sangtam	5	-	-	-	-
Yimchunger	5	-	-	-	3
Total	22 (48.89%)	9 (20.00%)	2 (4.44%)	11 (24.44%)	16.00 (35.56%)

from ericulture to some families of the respondents which offer the major portion of the family income. Respondents also highlighted that eri cocoon are less in income generation but somehow selling of eri pupa/ larva give additional income. Patil and Savanurmth (1994) also reported that ericulture is relatively a less remunerative occupation as compared to the production of other silks, but because of selling of pupae rearers are benefited. The respondents also shared that they usually reared about 10 to 50 eri DFL's and gets about 5 to 20 kgs of eri cocoons per crop which depends upon the number of DFL's they reared/ crop in a year which is directly related with the value of annual production and income. Out of the total 45 respondents, it is found that only 35.56% have received financial assistance from the Government. The study has also revealed that except four communities viz; Angami, Kachari, Khiamniungan and Yimchunger, the other communities did not receive any financial assistance, exhibiting lack of appropriate policy on the assistance to the sericulture farmers by the government. Since, financial assistance plays an important role in promoting host cultivation and rearing of worms, there is a need on the part of the government to look into the matter in making higher investment in sericulture. Appropriate policy in giving financial and technical assistance to the rearers is urgently needed in the state to promote sericulture and it's marketing for socio- economic development of the people, particularly the rural masses.

4. Conclusion

The present findings have revealed that there is a high demand of the eri pupae in the market, which can be a good source of income generation. Therefore, proper motivation, initiation,

training and development as well as extension schemes and projects should be implemented both by the Government as well as voluntary organizations on this sector. Good market linkage through regulated market or private dealers is the need of the hour to promote eri culture in Nagaland. In order to boost ericulture production to commercial level, there is a need for a comprehensive planned project with both financial and technical inputs so that it will provide sustainable livelihood to the farmers. Moreover, eri silkworm is a safe green edible insect where no chemical are used in the rearing process. Thus, eri products could generate supplementary income to the farmers as well as nutritional value assists. With proper technology of ericulture in large scale, there is ample scope to support the government in its food security policy in context of supplying edible insects as a protein source to different communities.

5. References

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