

Ethno ecological knowledge of the Sumi tribe of Nagaland: Insects as bio-indicators of weather prediction

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Abstract

The Sumi Nagas have been practising weather prediction through the behaviour of animal acting as an indicator. Similarly, prediction with the help of insect indicators were sought to be investigated and documented. This study seeks to identify and document the insect indicators through their behaviour, in predicting weather phenomena among the Sumi Nagas of Nagaland. The study was conducted in 4 villages of Zunheboto district- Sukhalu, Shiyepu, Natha Old and Natha New. Qualitative design of study was involved and data was collected through in-depth interview (IDI) and focus group discussion (FGD). Prior informed consent was taken before the process of data collection. Convenient and snowball sampling were used for the study – informants including elders, farmers, folk tellers and hunters, were selected from each village and information was collected from them. Adhering to the fact that, elders are the real custodians of traditional knowledge, all the informants both women and men were above 40 years of age. The study showcases a rich documentation of the insect indicators among the communities which they have used since time immemorial until now. This study was a tedious one as the elders were hesitant to share their knowledge and thus, rapport building was much developed to gain their trust making them understand that the study's sole purpose was for documentation and not for other means. The study identified, listed and documented 20 (twenty) insects which were aiding the Sumi tribe of Zunheboto district for predicting their weather even in present times. However, in the event of urbanization and development, this traditional knowledge has often been sidelined and in addition, the younger generation do not pay much attention to these age-old traditions. The study also entails urgent need for documentation of traditional knowledge before it completely vanishes.

Keywords: Ethno Ecological Knowledge, Weather Prediction, Sumi, Naga, Nagaland, Bio-Indicators

Introduction

Ethno ecology refers to the study of how traditional groups organise and classify their knowledge of the environment (D.L. Hardesty, 1977). It has a substantial value for clarifying the ways in which traditional agriculturalists conceptualize the ecosystems on which they depend for a living (P.F. Barlett, 1980). The Sumi Naga is one of the major tribes of Nagaland and is endowed with rich culture and tradition. They have sound knowledge of their environment and its resources and have lived in closed associations with nature. The Sumi Nagas have been dependent on their environment for food, shelter, medicine, livelihood, etc. One such dependence worth mentioning is the locals' knowledge of weather prediction through the behaviour of insects. Insects are the most species-rich taxon with about one million species described worldwide (P.J. Gullan and P.S.

Cranston, 2010), corresponding to more than half of all known species (B. Groombridge, 1992). Several studies have found that the behaviour of insects altered during changes in atmospheric pressure (S. Dunlop, 2003). Insects have high ecological diversification and short generation times, thus, insects are useful indicators of environmental change (T.D Schowalter, 2011; J.A. Thomas, 2005). In Japan (R.R. Dunn, 2000) it was found that activities of arthropods such as fleas, cockroaches, houseflies, spiders are indicators of the arrival of summer season (N. Kihupi et al, 2003).

These arthropods were noticed by farmers to be abundant during the summer. Another study in Zambia found that people indicated rainfall through the cry of the cicadas- the louder the sound of the cicadas, the more rain is expected (K.J. Mbata, 1999). Other indicators such as- spiders spinning shorter and producing thicker webs; earthworms coming out of the soil- indicates adverse weather conditions such as storm or flood (S. Acharya, 2011). A study in Bangladesh recorded certain indicators- increase of flies and mosquitoes, movement of ants,

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indicates hot and humid weather. These signs occurred about 5-7 days earlier before the 1970 infamous flood (P. Howell, 2003). In addition, some communities in Thailand also observed how high above the ground specific insects lay their eggs- higher above the ground reflecting the prospect of more rain as height protects the eggs from flooding (N. Suphanchaimat and W. Grisnaputi, 1985). It was also found that if centipedes emerge from their holes carrying their eggs in swarms, an early rainfall is predicted (U. Dixit and V.C. Goyal, 2011). In today's context it is crucial to document these behaviours of insects in predicting weather as traditional knowledge is increasingly diminishingly as a result of total ignorance and lack of documentation. It is, thus, highly recommended to identify and document traditional ecological knowledge in this ever globalizing world scenario.

Materials and methods

The aim of this study was to list and document the traditional method of weather prediction through insects as bio-indicators, among the Sumi Tribe of Zunheboto district. Qualitative design of study was involved and data was collected through in-depth interview (IDI) and focus group discussion (FGD). Prior informed consent was taken before the process of data collection. Convenient and snowball sampling were used for the study – informants including elders, farmers, folk tellers and hunters, were selected from each village and information was collected from them. Adhering to the fact that, elders are the real custodians of traditional knowledge, all the informants both women and men were above 40 years of age.

This was the first ever documentation of insects as indicators of weather prediction and there was no evidence of existing literature and documented data in the study area.

Results and discussion

Altogether, insects were identified and documented from the data collected in 4(four) villages of Zunheboto district. The indicators include insects and their behaviour, habitat, etc. These indicators are still relied upon and practised till today as part of their traditional knowledge.

1. Common name: Cicada
Local name: Ghoyii
Scientific name: *Cicadoidea*

People believe that cicadas' song brings rain. The louder the song, the more rainfall and vice versa. The villagers also call and chant prayers to the cicadas to sing in order to bring rain before the sowing season and even after. The song is actually a mating call for the females who are noticeably quiet in contrast to males.

2. Common name: Flying termites
Local name: Alhu
Scientific name: *Isoptera*

Sharing similarities with the Mizos of Mizoram, the Sumi Nagas also believes that after rainfall, if the winged termites come out of the soil in groups, it is a sign that it will not rain for few days. It usually starts from March till the summer season.

Its scientific explanation is that after rainfall, winged termites seek to mate and start colonies as the environment is moist which makes the survival more likely.

3. Common name: Mosquitoes
Local name: Amiyi
Scientific name: *Culicidae*

The Sumis use 'mosquito season' and 'summer season' interchangeably. If there is an alarmingly increase in the number of mosquitoes, it meant that summer season has begun.

In addition, during the mosquito season, if you notice that mosquitoes have suddenly disappeared, it means that rainfall is imminent.

4. Common name: Fire beetles/flyies
Local name: Saghu
Scientific name: *Lampyridae*

Fire beetles are another indicator of weather prediction. Villagers understand that warm and moist season has begun when they see fire beetles in abundance during the evening and at night.

5. Common name: Weaver ants
Local name: Alhache
Scientific name: *Oecophylla*

The nest structure of the red ants also predicts the coming of rain. If the entrance of the nest is upward and open, then less or no rain is expected. However, if the nest's opening is closed, rainfall is expected in good amount.

In addition, the size of the ant hill is also an indicator of rainfall. If ants build their hill with high walls, then rainfall is expected.

6. Common name: Caterpillar
Local name: Aninga
Scientific name: *Lepidoptera*

Caterpillars are found during spring till the early autumn and its presence predicts the warmer season. It is also to be noted that its decreasing number or disappearance indicates the colder season.

7. Common name: Bee

Local name: Akhi

Scientific name: *Anthophila*

When bees are seen busy and active, but suddenly disappears, the villagers understood that rain is approaching and so the bees have gone into their hives for protection.

8. Common name: Spiders

Local name: Thalaxu

Scientific name: *Araneae*

People also predicted the occurrence of rainfall/storm through the webs woven by the spiders. If the webs are thick, rain/storm is said to be approaching. However, if the webs are thin, then fair weather is expected.

9. Common name: Butterfly

Local name: Amimi

Scientific name: *Rhopalocera*

Butterflies' foraging habit also predicts rainfall. They are seen in abundance during a clear sunny day, however, if they disappear, then rainfall is expected. People predict rainfall through this indicator.

10. Common name: Cricket

Local name: Awusho

Scientific name: *Gryllidae*

The Sumi tribe also predicted rainfall through the song of crickets.

In addition, the disappearance of crickets predicts colder season/winter.

11. Common name: Lady bug/bird

Local name: Khetsunhe paza

Scientific name: *Coccinellidae*

Lady bugs are also an indicator of warm season. They are seen during spring and summer-warmer months, during which people start planting potato, radish, squash, eggplant, cucumber, tomato, etc.

12. Common name: Dung beetle

Local name: Amishibalu tsu

Scientific name: *Phaneus vindex*

Dung beetles are another indicator of rainy and humid season. They are found to be busy collecting dung and are seen most active during warm moist season. Villagers start cultivating soyabean, maize, turmeric, sugarcane, etc.

13. Common name: Grasshopper

Local name: Atikha

Scientific name: *Caelifera*

Grasshoppers are seen during hot and dry weather. It is an indicator that hot season is looming or had begun and there will be less or no rainfall.

If there is an alarming rise in the number of grasshoppers, then people fear that there would be drought.

14. Common name: Dragonfly

Local name: Tsuzu kha

Scientific name: *Anisoptera*

The flight of dragonfly is also an indicator of weather prediction. If it flies high in the sky, it indicates sunny day, while on the other hand, it flies low in case of an approaching rain.

15. Common name: Moth

Local name: Puthowu amimi

Scientific name: *Tineola bisselliella*

The appearance of moth by dusk and night is another indicator of warmer days.

16. Common name: Millipedes

Local name: Lathilala

Scientific name: *Diplopoda*

Julida millipede is an indicator of coming rains or moist weather. They are found in great numbers when there is good amount of rainfall as they survive in moist areas. If they hang around in good numbers, then it is a sign of abundant rainfall.

17. Common name: Fruit flies

Local name: Axhati mthu

Scientific name: *Drosophila*

When fruit flies are seen in abundance, people understood that it is time for harvesting.

18. Common name: Thunder flies/storm flies

Local name: Pasapagha mthu

Scientific name: *Thysanoptera*

When villagers notice the increasing number of thunder flies, it is understood that storm or heavy rain is on its way.

19. Common name: House flies

Local name: Amthu

Scientific name: *Musca domestica*

If houseflies are found in large numbers inside the house, then wet weather is expected.

20. Abundance of insects

When people notice that the numbers of insects are increasing, they understood that the warm season has begun.

Table 1 Insects as bio-indicators of weather prediction

Common name	Local name	Scientific name	Behaviour	Prediction
Cicada	Ghoyii	Cicadoidea	Singing	Onset of rainfall
Flying termite	Alhu	Isoptera	Appearance/Flight	No rain for few days
Mosquito	Amiyi	Culicidae	Appearance/abundance If suddenly disappears-	Hot weather/Summer season has begun Rain is imminent
Fire beetle/fly	Saghu	Lampyridae	Appearance/abundance	Hot and moist weather has begun
Weaver ant	Alhache	Oecophylla	Nest structure- If entrance is open- If entrance is closed-	Dry weather or very less rain Rainfall is imminent
Caterpillar	Aninga	Lepidoptera	Appearance/abundance- Disappearance-	Summer season Cold weather
Bee	Akhi	Anthophila	Busy and active- Disappearance-	Clear weather Rainfall is imminent
Spider	Thalaxu	Araneae	If webs are thick- If webs are thin-	Rain/storm is imminent Fair weather
Butterfly	Amimi	Rhopalocera	Abundance- Disappearance -	Clear, dry and hot weather Rainfall
Cricket	Awusho	Gryllidae	Singing Disappearance	Onset of rainfall Onset of winter
Lady bug	Khetsunhe paza	Coccinellidae	Appearance/abundance	Warm season
Dung beetle	Amishibalu tsu	Phaneus vindex	Appearance/ busy	Rainy and humid weather
Grasshopper	Atikha	Caelifera	Appearance/abundance	Hot and dry weather
Dragon fly	Tsuzu kha	Anisoptera	High flight- Low flight-	Sunny day Rainfall is approaching
Moth	Puthowu amimi	Tineola bisselliella	Appearance/abundance	Warm weather
Millipede	Lathilala	Diplopoda	Abundance	Abundant rainfall
Fruit fly	Axhati mi	Drosophila	Abundance	Time for harvest
Thunder fly/ storm fly	Pasapagha mi	Thysanoptera	Abundance	Storm/ heavy rain is imminent
House fly	Amthu	Musca domestica	Abundance	Wet weather is expected
Abundance of insects			Increasing numbers of insects	Winter had ended and warmer season has begun

Conclusion

This study is a vital evidence of the traditional wisdom of Sumi Nagas, necessitating immediate call and attention for documentation and preservation. As shown in table 1, the Sumi Nagas have been practicing weather prediction for a long time through the aid of insects as bio-indicators. They have also cared and nurtured the environment and hence, in turn, have relied on the environment for meeting their prediction requirements. As a matter of fact, both the people and the environment are living in a communion and complement one another for their survival. The Sumi Nagas still rely on these bio-indicators for predicting the weather and to carry out their daily activities. This study was a tedious one as the elders were hesitant to share their knowledge and thus, rapport building was much developed to gain their trust making them understand that the study's sole purpose was for documentation and not for other means. The study identified, listed and documented 20 (twenty)

insects which were aiding the Sumi tribe of Zunheboto district for predicting their weather even in present times.

However, the major setback is the depreciating value of traditional knowledge in light of the fact that there is no documentation, thereby, in the event of death of a knowledge holder, the wisdom disappears. In addition, the younger generation do not recognize the gravity in upholding the profundity of their rich traditions. The importance of the age-old tradition is overlooked and hence, the wisdom is lost. Therefore, it is imperative that traditional knowledge in all arrays be exclusively and crucially be preserved and promoted in order to maintain and enrich its existence.

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