



Cicadas - the tireless Crooners of the forest

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Keywords: Cicadas, Ethnoentomology, Festival, Meghalaya, Niantaser, Northeast India, Worldcup cicada

Humans' beings with all the modern amenities and advancement, long removed from the primitive living condition of the wild forests are even today bugged by the tiny six legged creatures known as Insects; be it in the sophisticated modern urban setting or in the rural settings close to the wild nature. For those of us who resides in the warm and humid tropics and close to some sort of natural forests one may not have failed to encounter these six-legged creature right from the time we are born. We have the dreaded mosquitoes that buzz around to suck our blood, spreading the deadly malaria, encephalitis and chikungunya; to the hordes of termites out for destruction, to pests invading our crops and foods. We make every effort to evade many of them from causing harm to our health and to our food grown in the fields. These small creatures have evolved and become so successful long ago; as early as million years back; long before we humans appeared on Earth and have seen and survived when even the giants like dinosaurs become extinct.

Insects are as varied as they are abundant, and they come in various sizes and shapes, some beautiful as the Butterfly and some instill fear as the dreaded buzzing yellow jacket (hornet). It is estimated that our planet have some 900 thousand species of Insects and there are thousands that remain unknown to science. How many of these insects we will be able to know is a matter of concern for us today, as it is expected that thousands will disappear or will be on the verge of disappearance brought about by disappearance of their pristine forest habitats across the world.

For many of us insects are just an annoyance and are things to be revulsed. Gone are even the days when kids were happy chasing butterflies and dragonflies. Today it's the age of smartphones and virtual world, there is a lack of human –nature experience, as scientist and naturalist poses concerns before us about how we are getting distanced and disconnected from Mother Nature and its amazing creatures- big or small. A recent review article in a leading scientific journal puts it appropriately: with the title - 'Extinction of experience: the loss of human- nature experience'. Yes, indeed we are heading towards a world that would one day lose our intricate connections with nature.

It is important, therefore for naturalist and scientists to bring to light the mysteries and amazements of nature to a wider audience. In this small popular article I am going to write about one such insects that is popularly known as the cicadas. Many of us may be aware of the saying 'happy are the cicadas for they have voiceless wives'. Yes indeed, the cicadas are one group of insects that does not fail to amaze us by their beautiful and often loud calls and by the fact they seem to play some kind of tricks to evade themselves from revealing to the untrained eyes. The loud calls or more scientifically tymbalisations as it is called technically is made by the males that have the apparatus called the tymbals which help them in producing such a loud blasting sound. Come summer you would hear them calling all over the forests, they are in fact the Crooners that sing tirelessly to attract the best of the females. Females however lacks the apparatus for producing this sound and are therefore silent. They do however may make flicking sound with their wings.

Life among the trees and under the ground

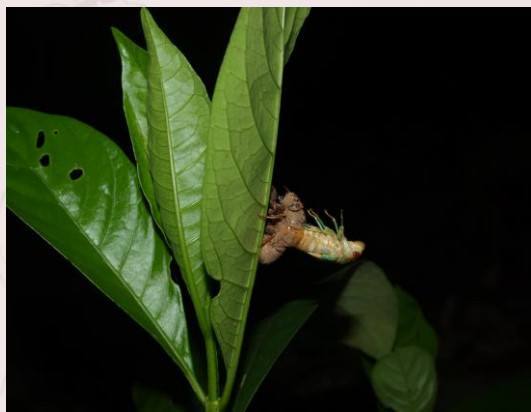
The loud buzzing calls of the cicadas often appear to be enigmatic. Their calls often coming from hundreds of males in the form a chorus are heard reverberating from amidst the branches and foliage of trees. Few are heard on arrival of summer initially but gradually becoming more and increasing in crescendo until they disappear equally mysteriously once the season is over. Appearance of cicadas are something of a mystery. Almost a century ago Entomologist worked on the life cycle of the cicadas and found that cicadas do not disappear or vanish during certain seasons but remain hidden deep underground as growing nymphs. While underground as nymphs, they are slow in their growth, which is due to the nature of the diet they have. The developing young cicadas known as nymphs or instars actually derive their nutrients from the root saps of trees. While underground the nymphs are pale white and one can in fact find them in lumps of soils while digging up soils along with attached rootlets, when we crush these soil lumps, we can see the tiny nymphs with their pointed rostrum or mouth still attached to the roots. It would take them several months before they assume the final instar, and then something would send them a cue which would signaled them to start the process of emerging over ground to finally transform them into a beautiful winged adult far from the bizarre looking nymphs underground. This is because Nature have imprinted in their genome the timing of the day when they would finally perform this act of emerging over ground.

One can observe this amazing event if one ventures with a torch light in the forest in the darkness of the night, and if we search on the tree trunks and on twigs of vegetation above ground, we will find them crawling up and securing on the bark or stem of vegetation with their pointed claws which are like the ice axe of climbers, helping them crawl up and remain fixed. Once securely fixed on the trunks, the magical moment will arrive after a while when a beautiful pale ethereal greenish form or teneral form will break open from the skin of the nymphs. Finally transforming into an adult.

During this emergence the adult males and the female start appearing and they can be seen roosting on the branches and twigs of trees. It is at this time that one would hear their

crackling with the calls of myriad species of cicadas each with its own musical notes and distinct from the other. Thus begins their life over ground. The adult cicadas have pointed mouthparts that have thin tube-like structure that can be pierced inside stems to reach for the sap. They draw in the plant sap and as they take in this the excess fluid is eliminated through their posterior end. When hundreds of cicadas feed of tree branches, they eject this excess fluid which falls downward often in the form of light drizzling rain. They are now ready to perform their primordial task of self-propagating, which is through mating. The males would be crooning all day long to attract females, with whom it will finally mate. The males have played their role and they would gradually die out of exhaustion, the females with their long and serrated egg laying apparatus also known as ovipositor would make egg nests in the form

narrow groves on the trunk and lay her eggs, the eggs will hatch and tiny young once emerge and somehow, they crawl down or fall on the earth and the cycle then repeats again.



The freshly emerging adult of the periodic “Worldcup cicada” (*Chremistica ribhoi*) from its nymphal skin (on top) and the just emerged adult delicate and greenish, which will turn brownish within hours

Photo: Author

Some cicadas are annual and some periodic

Most of the cicadas appear annually and are very common, they are heard every year with the arrival of a particular season; however, there are a few species that have an enigmatic appearance and appear only after an interval of several years. The cicadas that show periodicity, the famous among which is the ‘Seventeen-year cicada’ or *Magicicada septemdecim* found in the United States have a long periodicity of seventeen years. Others include the Eight-year cicada or ‘*Nanai*’ or *Raiateana knowlesi* of Fiji Island. In India we are fortunate to have a fascinating cicada with a four-year periodicity popularly and fondly known by the Khasi community living in Bhoi areas of Meghalaya where this particular cicada emerges as the ‘world cup cicada’, it was so named due to chance synchronicity of

its emergence with FIFA world cup. The “world cup cicada ‘or ‘*Niangtaser*’ as the local love to call it was known to the local as long as they can remember, its prevalence within a much larger area within RiBhoi are still been talked about by the villager elders, who themselves witnessed the mass emergence long ago when the forest used to be so close to their villages. Scientifically however, this unique and amazing periodic cicada was not known to cicada biologist and remained unidentified and undescribed until the author happened to himself witness the mass emergence event during the year 2007. However, it took few more years consulting international cicada experts and to finally describe it taxonomically as

Chremistica ribhoi. The name of the species being named after the locality *Ribhoi* as per provisions of the zoological nomenclature.

The ‘World cup cicada’ or ‘*Niangtaser*’ of Meghalaya

‘*Niangtaser*’ or the world cup cicada was known to the local indigenous communities since a very long time, and they have valued this cicada as an item of delicacy, eaten in many forms including roasting the still freshly emerged cicadas over wood fire; or pickling in vegetable oil with spices; and even sun dried and kept for long to be relished months after they are gone. Unlike the annual cicadas, the emergence of this periodic cicadas often occurs as a synchronous event during which the nymphs which were all this time underground starts emerging over ground occur together *en masse* within a brief period of about a fourth night during the month of May. Once mass emergence occurs in a particular year, the next emergence will occur again after an interval of four years. This periodicity in emergence is maintained and locals know for certain the year when the next emergence shall take place.

This natural phenomena of the unique cicadas species known popularly as the ‘Worldcup Cicada’ was certainly known to the people living in RiBhoi since time immemorial, and therefore, we find associated with this cicadas an unique folklore, prevalent among the Bhoi Khasis, a narration as to how this cicada had appeared into the forest. It is said that long ago there lived an old woman in a village, one day she suddenly developed severe stomach ailment with watery diarrhea and had to go frequently for constant call of nature. The villagers fearing it to be a contagious, lead the old women deep inside the forest, where the villagers build her a bamboo thatch, she was kept there along with food and daily amenities. It is said that after few days when the villagers went there to check on her, they found her missing and nowhere to be found around, peculiarly they were amazed at thousands of cicadas flying and resting on the tree branches, and all of these cicadas were discharging a watery fluid from their rear. This made the villagers think that these cicadas who were continuously discharging watery fluid from behind was in fact the old women who had turned into thousands of cicadas, and was still suffering from the stomach ailment.



Just emerged adults freshly gathered and ready for various delicious preparations

Photo: Pankaj

‘Mass emergence’ and a celebration of the gift of nature- ‘*Niangtaser Festival*’

For people living in RiBhoi, the emergence of ‘*Niangtaser*’ is a gift from nature. Once in four years that too in a small span of a forth night, they exhibit the amazing phenomena of ‘mass emergence’, wherein thousands of the nymphs of ‘*Niangtaser*’, that were developing and growing over period of four years begins emerging in hundreds and thousands from the ground. As the darkness sets in the forest of ‘*Iwesier*’ and other forest of RiBhoi areas. This is time of festivities for the villagers as they gather and venture inside the forest for the evening picking. There are hundreds of these emerging adults ready to be picked and



‘*Niangtaser festival*’ at Iwesier village -promoting ecotourism and spreading conservation awareness

Photo: Pankaj

gathered from the forest. One can witness the excitement as young and old entering the woods as the evening approaches. Each carrying a torch which now have replaced the ‘*dongmusa*’ or the bamboo lantern and the ‘*tingna*’ on their waist, which is a short piece of hollow bamboo, with string that it tied around the waist as a waist pack. Within it also contains a length of bamboo rod. As they search with glow of the torch on the bamboo grooves for the freshly emerged adults that is still attached to its nymphal skin, once picked it is immediately pressed with thump and fingers to squeeze out the fluid, it is then put on the bamboo container, as the container gets filled then it is occasionally pressed with the bamboo rod, it is said that this way it prevents the fresh adults from becoming hard and distasteful.

According to the research on the nutritional properties of this cicada conducted at North-Eastern Hill University, a number of nutritional components were found to be present in good amount, including carbohydrates, proteins, minerals like iron, calcium, magnesium, zinc, manganese, Selenium have been found to be present. Also include are Vitamin A and E, lipids and amino acids.

People of Saiden near the district headquarter town of Nongpoh since last few emergences of this unique natural cicada event have been organizing the ‘*Niangtaser festival*’ at *Iwesier*

village with lots of fanfare; with number of stalls catering indigenous food preparations, singing and dancing competitions, nature camping, etc., which of late have been helping in promoting this event and ecotourism.

Some cicadas are small and some are large and loud

Cicadas come in varying shapes and sizes, the smallest ones measure not more than a centimeter to some as large as ten centimeters. Most cicadas have brownish body with transparent wings, however few have dark body with colorful wings, which are even comparable to butterflies in terms of their beauty, so much so that a famous French cicada biologist have referred them to as '*Butterfly cicadas*'.

Cicadas in tradition and ethnic cultures of northeast India

North east India is unique, here we have diversity in indigenous cultures who are in intimate relationship with nature. Several insects are considered as delicacy and relished by many communities forming an important source of natural proteins and other nutritional components. Insects also form an integral part of the traditional folklores and belief of the indigenous communities.

The practice of cicadas as edible items is prevalent among the communities of northeast and southeast Asia. Rural folks can be seen using long bamboo poles with sticky natural glues concocted with plant resins to capture adult cicadas right off the trees. The practice is so ancient that even in ancient Chinese text mention may be found about the art of catching cicadas with long bamboo poles. In several parts of northeast, cicadas are considered a delicacy, there are caught in the evening by clapping two bamboo pieces and lighting a small fire, cicadas get attracted to the clapping sound of the bamboo sticks and the light from the fire; they come flying and rests on cut tree twigs that are inserted on the ground near the fire.

Like many other communities across the globe, several tribal communities inhabiting Northeast India, cicadas are part of their traditional agrarian heritage and many folklores are woven around the humble cicadas. For instance, among some of the communities of Nagaland, cicadas are considered as harbingers of the arrival of seasons, each changing season is heralded by the changing call of a different species of cicada. For instance, the beginning of the loud chorus of *Pomponia* and *Platylomia* species signals the timing for paddy cultivation. Among the Adis and Galo communities inhabiting Eastern Arunachal, cicadas referred as NyanyNyare or Goyeng, as per their folklore, they are said to have two sisters Yangi and YayaYaing, among them Yangi was considered a great singer because of her periodical melodious notes and buzzes and, she is therefore considered as an indicative of seasonal changes.

These folk tales which are intimately associated with the life of the tribal folks once upon a time show how deeply connected these communities were with nature. They may fade away gradually from our memory with changing times and modernization. Young children playing close to nature once were fascinated and chased these insects. That culture may be gone and along with we are going to lose the delicate connections with every aspect of nature.

Cicada diversity in northeast and India

India has somewhere around 172 species of cicadas belonging to 47 genera. Most of these cicadas are from Northeastern India, the Western Ghats and the Himalayan belt. Northeast India alone has somewhere around 76 species of cicadas belonging to 45 genera. This is based on recent published review based on literature and also on our survey, sponsored by the department of biotechnology, government of India. Northeast India is home to some of the interesting species of cicadas like *Salvazana mirabilis* and *Salvazana imperialis*, which is a large colorful ‘butterfly cicada’ which was discovered from Meghalaya. Similarly, there was an interesting new species of a large cicada species – *Platylomia kohimaensis* discovered from Nagaland by the author who happen to identify the undescribed species based solely on the calls, which was never heard off by the author. Similarly, one more interesting species of cicada is under review for publication as I write this article. It is seen that over the last few years some new species of cicadas have been discovered from northeast states and we expect several undiscovered species of cicadas from this region with continued survey and documentation.

Cicadas and conservation

Cicadas have their own intricate role in the overall natural scheme of things. They may not be considered economically important, considering they do not offer us thing valuable as resources in the form of honey as in bees and silk from the silkworms. Neither are they involved in pollination. However, they constitute an important component of a forest ecosystem, and form an important component of the forest food web. They are prey to many animals including, frogs, snakes, birds and small mammals. Ecologically, they act as nutrient recyclers, their underground tunnels aerate the soil and contribute towards enrichment.

While many cicadas are common and plentiful, there are few like the ‘Worldcup cicada’ that may need to be conserved, if our future children are to see these amazing insects. While they are still not considered important for conservation; we will be poorer if we are to lose some of these amazing cicadas.

A poem on ‘the *Niangtaser*’ written by me, it is slightly modified from my earlier version.

I am the ‘*Niangtaser*’
 I come after every four years
 deep within the earth I dwell
 As I wait for four long years
 In the darkness of the earthly womb
 To see the light of the day
 The tree roots nurture me with her sweet sap
 And caress me when I am out on the trees
 Spreading my wings
 I am here today, so was I
 for millions of years
 I don’t claim the Earth, nor do I claim the sky
 But let us also live beneath the twinkling stars
 and sing among the branches

and bask in the glory and warmth of the sun
I am the '*Niangtaser*'
And I come after every four years.

