

NEWSLETTER of the NILGIRI NATURAL HISTORY SOCIETY

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3 **Conserving pollinators** - a landscape approach

5 **Crop Diversity** and Indigenous Bees

6 **Creating** Pollinator Habitats

7 **The Bee's** Knees

9 **A Native glimpse** into Pollination

13 **Pollination strategies** of weed species



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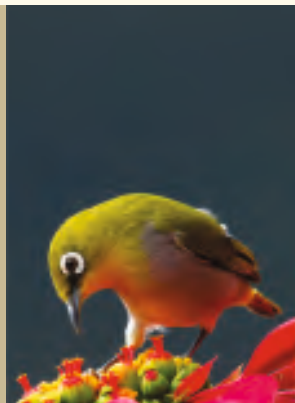
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Oriental White-eye *Zosterops palpebrosus*

The Oriental White-eye (*Zosterops palpebrosus*) is a small passerine bird. It is a resident breeder in open woodland in tropical Asia. It forages in small groups, feeding on nectar and small insects.

Photo credit: NA Naseer

EDITORIAL

A very happy new year 2014 to all our readers! Winter in the north eastern slopes is particularly beautiful, frosty mornings, splendid sunrises giving way to azure day skies fading into smoky hues at dusk; the nights are not to be outdone with spectacular displays of every little star in the galaxy.

Winter brings special visitors to our mountains, especially winged ones who are fleeing harsh winters of the higher altitudes. These winged visitors and the resident ones fill our mountains with color and song while performing their ecological roles as pollinators and seed dispersers in return for nectar or a nesting site. In this issue of the newsletter we dwell at length on the role of pollinators and their contributions to our landscape.

Manju Vasudevan and Robert Leo have contributed articles which cover a range of topics from importance of insects viz. bees as pollinators and their role in the indigenous agricultural landscapes. Hien Ngo has contributed a piece about the Global Pollinator project which is happening in many regions and Keystone is implementing this protocol in the Nilgiri landscape.

A few days ago a Common Rosefinch was spotted picking at the fruits of the mistletoe which grows on our pear trees. The Rosefinch is a winter visitor and is helping the mistletoe spread its seeds – one almost wishes it wouldn't do that because the pear trees die when the mistletoe grows abundantly! Dr. Shivanna has an interesting piece on the pollination mechanisms of weedy and invasive plants which makes for a very interesting read throwing light on the evolutionary tradeoffs that a species exhibits.

Pollination biology as we study it now can trace its origins to two approaches – studying flower structures and their interactions with animals as founded by Sprengel (1793) and understanding the influence of pollinators on evolutionary processes as proposed by Darwin (1862). The knowledge of pollinator diversity which lies with local communities is often overlooked and less understood. Rev. Philip Mulley in his column 'From Amongst the Blue Hills' brings a fascinating insight about pollination and its significance that was common knowledge to traditional cattle herders and agriculturists. One wonders if this knowledge has been documented and transferred or does it only stay in the pages of the 'Reverend's reminiscences'.

Regional news from Nilambur, Kotagiri and Chamrajnagar are compiled in the pages of the Kaatupoovu, Bidaru satta and Nisarga suddhi. These pages are a compilation of the major events of the past 6 months. The Bee Museum and NNHS activities continue under the dynamic leadership of Sumin George Thomas – President, Sangeetha Ramakrishnan-Outreach Manager and Vinoth – Bee Museum incharge. Read more about it in our Bee Buzz and the diary of the NNHS.

We hope you are encouraged to become members of our society which is turning 5 years old very soon.

Happy reading!



Lonicera japonica - a common hedge plant in the agricultural areas of Hassanur, Sathyamangalam

POLLINATORS IN NATURAL FORESTS

Ecosystems are composed of intricate and often fragile partnerships. And one of the most mysterious and evolutionarily exciting among them is pollination. Flowering plants everywhere on the planet spend a whole deal of energy on advertising, so as to cast a spell on insects. They have invested on a suite of traits to ensure effective pollination under pristine conditions. But not any insect will do: certain species are more effective and allegiant than others. Orchids, for instance, have very complex flower structures and only specific insect taxa can carry their pollen to another flower's stigma. Tropical parasites like *Loranthus sp.* attract their sunbirds for their pollination needs. Wild *Musa sp.* (banana) are known to be bat-pollinated. The Mexican Yucca plant and its co-evolution with the pollinator hawk moth is another commonly used example to illustrate specificity in pollination systems. The survival balance in such plants is so delicate that if the specific insect were removed from the habitat, the plant would go extinct from lack of reproduction.

In the tropics, generalist pollination systems are more common. Being a generalist is somewhat safer for a plant in a disturbed habitat since it allows a range of pollinators offering the service - beetles, flies, thrips, wasps, moths, and bees only one among them. Most tropical trees in the Western Ghats come under this category.

Even with a luxury of choice in generalist pollination mechanisms, there are other factors that could push these plants to a reproductively vulnerable status. Habitat loss and fragmentation is one such threat. There is plenty of evidence that pollinator abundance and diversity decline with forest degradation and fragmentation. Conversion of natural habitats to human designed structures or mono crops is another threat to bee habitats, particularly of solitary bees that nest in tree cavities, clay or mud banks, reeds, etc. Introduced bees and the diseases they bring along are another threat that farmers in the Himalayas have had to face.

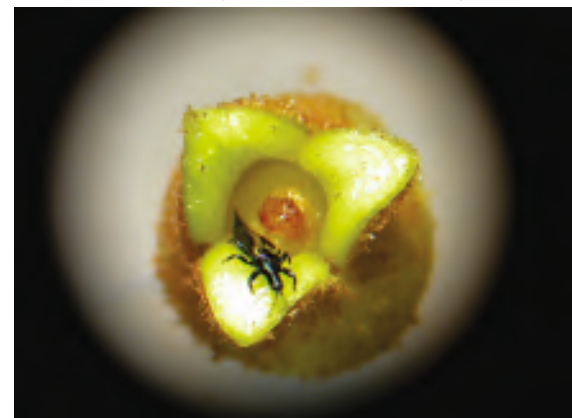
As forests and other wild habitats become increasingly fragmented and ecologically compromised, the challenge of attracting

and supporting effective pollinators has intensified greatly, potentially resulting in a significant decline in fruit and seed production, in forests as well as agricultural crops.

THE FARM-FOREST LANDSCAPE MATRIX

Forest health

With the growing human population and its ever-growing demand for food, more land is being converted for agricultural production and mono crops such as tea, and more soil is being eroded, by clearing



Thrips are believed to be one of the pollinators of wild nutmegs in the Western Ghats.



Flowers of pomegranate are self-pollinated (do not need pollinators), but insect pollination boosts their fruit set

forests which are extremely important bee refuge areas. The closest example to witness is right here in the Nilgiris.

Experiments and observations in many parts of the world now have shown that several crops suffer a pollinator deficit in circumstances where bee nesting habitats have undergone land use change. In extreme cases the farmers must hand pollinate flowers in their crop which in turn places a larger demand on manual labour. A much cited example is that of the apple orchards in China: their pollinators having gone locally extinct, the crop is now intensively hand pollinated to secure fruiting. Wild honey collection in Kutch (Gujarat) last year fell to 50 tonnes from the usual 300 tonnes in previous years because of the fall in the number of honey bees. The yield of certain native crops like date palms, lemon, papaya and kesar mangoes has also decreased. Sunflower farmers across the country acknowledge the significance of bee visitations in their crop: a decline in bees would mean they must manually pollinate each flower.

Lack of native forest cover in areas adjacent to crops can be a serious problem. Domesticated varieties of wild species such as nutmeg, pepper, citrus, etc. show frequent bad years of fruiting due to lack of sufficient pollination. Sometimes diminished native tropical forest around the horticulture farm to supply pollinators is the actual problem. Domesticated crops inevitably 'borrow' pollinators from their wild cousins and therefore any decline in forest cover and wild populations is dangerous. Obviously such systems are in jeopardy of losing their pollinators and thus of conservation concern.

Poisoning of bee foraging resources

Modern farming is chemical intensive in nature and eradicates pollinators, natural enemies of pests and litter decomposers, all of which offer an invaluable service to agricultural land. On the other hand, studies and organic movements across the world have emphasised on the need for more sustainable farming practices; practices that would assure pollinator diversity alongside agro-biodiversity.

The global pollinator crisis is not an exaggerated theoretical construct. There are in fact some dramatic cases of pollinator loss recorded. The United Kingdom alone has lost three of its 25 species of native

bumblebee, and six more are listed as endangered. Four bumblebee species have gone extinct from Europe, and there is evidence for similar declines in North America and China. One of the major causes of bee declines points to the use of neonicotinoids, a nicotine-based pesticide that has been banned in many parts of Europe. The Tamil Nadu Agricultural University portal mentions the impacts of indirect exposure to pesticides from the spray drift in farms or bees foraging in sprayed crops. The Nilgiris, as a region dominated by tea and hill vegetable crops that are under intensive chemical farming, paints a rather grim picture for the pollinators. As our farms become pesticide laden monocultures of cash crops like tea, cotton, rubber and corn - plants that provide little pollen for foraging bees - honeybees are probably starving.

I tend to think that if the bees did not rear in 'private' spaces (hives, for instance) and if their larvae fed on plants like those of butterflies, their populations would have gone extinct by this time, considering the magnitude of pesticides sprayed on crops. That a colony collapse disorder has not struck the bees of the Western Ghats or the rock bee colonies seem to carry on with their seasonal migrations is not reason for complacency. Because, we do not know enough about bees or their thresholds to make assumptions about their populations.

Dr. Manju Vasudevan is an ecologist associated with the Conservation Team at Keystone. Her research interests are pollination studies, habitat threat assessments and sustainable ecosystems. She can be contacted at manju@keystone-foundation.org



Apis florea the dwarf honey bee foraging on mustard crop, Hassanur, Sathyamangalam

Crop Diversity and Indigenous Bees

- Robert Leo and Manju Vasudevan



A millet vegetable complex in an indigenous farm in Gudalur, Nilgiris.

The *Mannukaran* in a mountain Kurumba village is a fascinating resource person. He is the one who holds the traditional knowledge on soil fertility, on disease and pest management, on weather forecast and seed selection. In times when modern farming is rapidly pushing its way to the remotest of Indian villages with its smart seeds and fertilizer subsidies, it is a saviour that the *Mannukarans* still exist and although in some places the practice may need revival, such communities where seed diversity and sovereignty matter are a breath of fresh air.

Talking of pollinators brings us to common ground between seed keeper and consumer, between bee keeper, adivasi and conservationist. During 2009, Keystone was actively engaged with communities in a project aimed at securing agro biodiversity and food security through habitat reconstruction to support indigenous pollinators. An important aspect of the project was to establish linkages of bees and other native pollination systems with the economically and culturally valuable plants. At the end of it we had established community seed banks, a local network of seed exchange and 'seed yatra' a campaign for agro-biodiversity and its benefits for fodder, nutrition and food security. About 200 species of plants, traditionally cultivated as well as wild, were identified as important in the millet agriculture system and most are bee-pollinated, suggesting that these crops are valuable pollinator foraging habitats.

In areas where millets and vegetables are grown together, the aspect of pollination is

closely linked to the livelihood of subsistence farmers and most of these farms are held by marginalised indigenous farmers in the region. Such millet-vegetable complexes are unique to the remote indigenous villages, embedded inside forests.

POLLINATOR FRIENDLY PRACTICES

Pollination services are not only of economic importance, but they support agricultural diversification and healthy diets for farmers in many parts of the world. Most of our food crops need a pollinating agent and the entire human civilization's food security rests on the wellbeing of the pollinator, which in many cases, is a honey bee.

Some of the preliminary research at Keystone and elsewhere in the Western Ghats has focussed on understanding the diversity of native pollinators, their refuge areas in terms of nesting sites in the wild and foraging preferences. Although millets do not require insect pollinators for reproduction (being wind pollinated), the millet-vegetable complex characteristic of indigenous farms is so diverse that they offer diverse foraging resources for pollinators: in fact insects visit the millet flowers for their pollen supply. The foraging resources are provided by shrubs of okra, brinjal, etc., runners and creepers of beans and gourds, and a variety of tubers, greens and other herbs. The resource diversity is not restricted to the crops grown. A recent scientific study in the vegetable farms of Tadsalatti in Hassanur revealed the significance of hedge plants and their diversity in inviting insects

and birds that could prove useful to the economic crop, in terms of pollination and pest control services.

ECOSYSTEM SERVICES

A large percentage of the world's crops and wild plants are pollinated by animals, largely insects. The value of global pollination services to cultivated crops is estimated to be worth 153 billion euros per annum. Farmers in Europe are given compensation for maintaining wetlands even if they are not cultivating, for the wetlands are bird nesting sites. They are compensated for keeping fallows that support pollinator diversity. Pollination is an important ecosystem service, often taken for granted in tropical countries.

Crops such as tea and hybrid vegetables do not support pollinators, and such crops dominate our landscape today. Such crops not only deprive us of food diversity and food security, but they leave other crops that need insect pollinators and their nesting habitats vulnerable. In addition to loss of native forests that are important bee refuge areas, there is the risk of introduced bees and pesticides for pollinators to face. What farmers need are not fertilizer subsidies but incentives for organic farming and mixed cropping, the kind practised in indigenous communities.

Indigenous hill communities of the Nilgiri Biosphere Reserve were traditionally hunter gatherers and their exposure to agriculture may be rather recent but appears very spiritually evolved. Their farming practice has space for weeds in the hedge and the rarest of native pollinators. Their farming philosophy willingly accommodates losses from crop raids; in their opinion part of the crop produce is the rightful share of a wandering wild animal, and not a matter of conflict.



Mimosa pudica, a common hedge plant. Hedge diversity increases pollinator visitation on crops.

Creating Pollinator Habitats

- Robert Leo

As an effort towards securing social and solitary bee habitats in millet-vegetable growing areas across the Nilgiri Biosphere Reserve, a number of nesting sites were created in wood, clay and reed, and placed near field margins. They may be called trap nests, and are a brilliant way to study solitary bees and their diversity. They have also been used as a management technique in other parts of the world to provide nesting sites to solitary bees. Alongside installing artificial structures, existing natural structures were identified with the help of farmers, and these ranged from dried logs, fence poles, field huts, stumps, root stocks, cattle pen walls.

- Solid Wooden blocks: drilled holes were made in varying dimensions ranging from 4mm to 8mm in diameter and 10 to 25mm in depth on well dried wooden block and placed in the middle of millet fields. 276 blocks were used.
- Split Wooden blocks: similar shape and sized blocks with split types were made to open observe/identify the agents and placed in millet and vegetable growing areas. 276 split wooden blocks were used.
- Clay pouched structure: clay pouches of varying depths and widths were prepared and kept along the fence for the pollinators to nest. 215 pouched clay structures were used.
- Reeds: reeds of different diameters and lengths were tied in bunches on trees, fences and shrubs for pollinators to nest. 3225 reed cuttings were used across 43 fields.
- Wooden poles & logs: dried wooden poles and logs drilled with different sized holes were placed scattered in millet growing areas.

There were frequent instances of bees, ants, beetles, wasps and spiders taking up these nesting sites.



Nesting sites for *Xylocopa* spp. in bamboo poles, artificial wooden hive to rear *Apis cerana*, a social bee.



Tubular nesting habitats created in reed (left) occupied by solitary bees (middle), and a Dammar bee nest in a clay pot hung on a house wall (Right).

In five geographical landscapes where trap nests made of wooden blocks and where clay pots and reeds were erected, monitoring gave us the following results in terms of number of nesting sites occupied by solitary bees.

Region	Tubular reeds	Bamboo blocks	Wooden	Clay pots	Hives	Dead logs
Sigur	187	9	12	16	21	3
Pillur	154	6	3	7	11	5
Hassanur	231	26	2	8	19	30
Arakode & Coonoor	126	22	2	1	3	9



Documenting solitary bee's nesting structure: the leaf cutter bee makes cup shaped nests in leaves of mallows. The circular cut on leaves of mallows indicates the presence of this pollinators

Knowledge of Pollinators

Indigenous hill community's practise farming without spraying chemical pesticides and this in itself is what can be called 'pollinator friendly'. Our intervention to secure existing bee nests and creating new habitats was useful in demonstrating the link between crop diversity and presence of a variety of pollinators, and eventually the benefits of pollinator diversity to crop productivity. It created a wave of awareness in protecting these structures even during the non-cultivating seasons within the farmer groups.

While the occupation of natural and artificial nests by a range of pollinating insects can be considered a significant research outcome, from an outreach point of view, the indigenous farmers consciously participating in the initiative and realising the value of traditional structures in the health of their crop was a valuable outcome. The attempt also demonstrated the cost effectiveness of such methods and the ease with which farmers could adopt these in their farms and thus contribute to knowledge building among them.

Robert Leo is Deputy Director, *Appropriate Technologies at Keystone*. He can be contacted at leo@keystone-foundation.org



The Bee's Knees

- Hien Ngo

It's been almost three decades since famous entomologist, E. O. Wilson, wrote about the little things that run the world (the importance and conservation of invertebrates) (Wilson, 1987). Many of these small creatures perform services that are very beneficial to people. Ants, for instance are “ecosystem engineers” when it comes to affecting soil structure and the flow of energy in soil (Folgarait, 1998). Beetles, the most speciose group of organisms on this planet, are important nutrient recyclers, but the most

widely recognized group of beneficial insects are bees. Bees provide many essential pollination services for approximately 76% of our global crops (Klien et al., 2007).

These super insects not only pollinate most of the food we eat, they also pollinate 87.5% of all flowering plants globally which provide ecosystem stability.

Lastly, bees provide direct products such as wax, pollen and honey. Their work has not gone unnoticed. The global community has recognized pollinators and their pollination services as being vital for sustaining human livelihood. In 2000, the Convention on Biological Diversity established the International Initiative for the Conservation and Sustainable Use of Pollinators, also referred to as the International Pollinators Initiative (IPI). The Global Pollination Project was part of IPI's Action Plan.

The Food and Agriculture Organization of the United Nations (FAO) coordinates the Global Pollination Project, which originally included seven partner countries: Brazil, Ghana, India, Kenya, Nepal, Pakistan and South Africa. The objectives of the Global Pollinator Project were to identify pollinator conservation practices and build capacity in applying pollinator assessment tools using an ecosystem approach.

The information and on-going research coordinated by FAO and the Global Pollination Project could provide solid baseline information and inputs for the



newly developed Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES). The Intergovernmental Platform on Biodiversity and Ecosystem Services is an independent intergovernmental body responsible for producing credible and independent status assessments of biodiversity and ecosystem services; this information is then translated for decision makers to effectively develop policies towards conserving and managing these ecosystem services.

The FAO and the INRA (L'institut National De Recherche Agronomique of the French government) in Avignon, France developed a protocol to identify and assess pollination deficits from a farmer's perspective. This protocol was implemented in the seven original participating countries in the Global Pollinator Project and is now being applied in an additional five partner countries: Argentina, China, Colombia, Indonesia and Zimbabwe.

In Tianshui, Gansu (China), turnip rape (*Brassica rapa*) is an important crop. Little is known about the pollination requirements of turnip rape in this region and the effects of pollination on crop production. In April of this year, the FAO worked with Chinese Academy of Agricultural Sciences and the



Gansu Institute of Apiculture to implement the Protocol in turnip rape fields. The research team asked the question of whether or not distance from large forest fragments affected the pollinator community and their pollination services to turnip rape. The research took place from April until July and crop harvest took place in September. The results are now being analyzed and will add to the larger meta-analysis from 11 countries that will inform IPBES on ways of assessing pollination services. In 2012, China produced 1.5 million tonnes of oilseed crops, and Chinese oilseed exports are projected to

increase by 40% between 2013-2022 (www.oecd.org). The implementation of this study could not have been more timely, linking the pollination services provided by bees and optimal oilseed crop production is important for China on local, regional and national levels.

All of the partners involved in the Global Pollination Project are implementing the Protocol in their own countries with crops important to their region. With growing recognition of bees and their pollination services, hopefully no one will forget the little things that run the world.

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Hien Ngo is a PhD student at York University (Toronto, Canada) and is a consultant to FAO on pollination matters





A Native glimpse into Pollination

- Rev. Philip K. Mulley

Certain authorities (Hans von Lengerke and Francois Blasco, 1989) who have studied selected pollen spectra in the Nilgiris have traced the oldest reconstructable vegetation history of these hills back to about 38,000 years. The pollen profile of the Nilgiris, archaeologically estimated is said to offer a perspective as old as from 8000 BC (Dilip Chakrabarti, 2006).

In a less remote sense, Badaga tradition refers to earliest evidence of some sort of seed generation and propagation from the neighbourhoods of *Mudubola* (ancient field) and *Baakibola* (wild edible 'grass-rice' field) beyond Lovedale. These place names in recent times have been unfortunately Anglo-Tamilised to *Mudugola* and *Balacola*. Migration of buffalo herds from as far as east in Tandanand (Kotagiri) to Muduhola among many such trails are also well known in the history of Badaga pastoralism. Toda movements also corresponded to this kind of pattern. The occurrence of what the experts call "the overall values of the grasses and forest shrubs" crisscrossing these terrains also came to be reflected in the cultural idioms that emerged in later times.

The ecological boundaries recalled in Nilgiri lore, for instance, from *Baaniore* (Upper Bhavani) to *Baanukaadu* (Kodanadu) as well as from *Talamalai* (Hassanur) to *Yellemalai* (Gudalur) were said to relate to specific pollinators. *Badaga Hethe* (the Virgin

Ancestress) in her primitive form was saluted as the patroness of this floral domain. Honeybees (as known from a Kurumba legend), beetles, moths, insects, birds etc. were known as effective pollinators. A popular pastime for Badaga lads during their herding sojourns of old times was always to make an inventory of plants and their 'pollination moorings'. The native tribes in the Sigur plateau (especially of Anaikatti) were considered as excellent monitors of bee-pollinated habitats.

Wetlands were recognized as good foraging sources for pollinating agents. Balsams in the wild and different kinds of beans (avare) and mushrooms of eight varieties were considered to have provided crucial inputs to the pollination-complex in the highlands. A Badaga proverb also indicates that the pollinating bees always topsy-turvied the rainfall patterns. The mossy foliage on forest floors was believed to augur well for the overall pollination mechanism.

Coming closer to modern times, the ushering in of "English vegetation landscape" by Sullivan and consequently the rapid invasion of coffee and tea plantations since about the 1830s completely changed the pollination map of the Nilgiri region. Will the ecologically compromised habitats of post-modern times be redeemed by any divine interventions, is of course, a moot question. But recollection of a time honoured ritual in

the local folk-religion seems to be apt.

The Badagas of these hills, once upon a time invoked their ancestral spirits to flourish the process of pollination. In addition to buffalo-herding, being also swidden cultivators and millet farmers from very early times, they made a ritual offering of five select flowers (distinct from one micro-region to another) in a ceremony commemorating their ancestors. This ceremony also heralded the beginning of their *Hethe* celebration. The five spp. (identification only tentative) always included the following and may have had more in the past. viz. *Plectranthus nightii*, *Lobelia excels*, *Senecio neelgherryanus*, *Caesalpinia decapitala*, *Leucas rosmarinifolia*, *Sophora glauca*, *Rubus racemosus*, *Rhodomyrtus tomentosa*. The ceremony is still in vogue but in an entirely different complexion. The scientific relevance of what are called these "protective flowers" is lost to the vagaries of cultural amnesia.

An apocryphal version of both Toda and Badaga fables recalls that the embroidery on Toda cloaks represents a colourful pollination chart on the paths to the afterworld!

Rev. Philip K. Mulley blogs at fromamongstthebluehills.blogspot.in and can be contacted at pphilipkmulley@gmail.com



பீதரு சத்த

வெள்ளெரிகோம்பே ஊர் சிறுவர்களால் உருவாக்கப்பட்ட இயற்கை மாத இதழ்



கற்றதும் அறிந்ததும்

இந்த மாதம் கோர்ப்பதி கிராமத்தில் சிவா எங்களை காட்டிற்குள் அழைத்து சென்றார். அப்போது எங்களுக்கு சாம்பிராணி செடியை காண்பித்தார். அதில் குழந்தைகளுக்கு, சளி ஏற்பட்டால் அரைத்து நெற்றியில் போட வேண்டும் என்று சொன்னார். அடுத்து சர்க்கரை வியாதி தழை, இதனை அதிகமாக காய வைக்காமல் அரைத்து பாலில் கலந்து சாப்பிட்டால் சர்க்கரை வியாதி குணமடையிம் என்றும் தெரிவித்தார்.



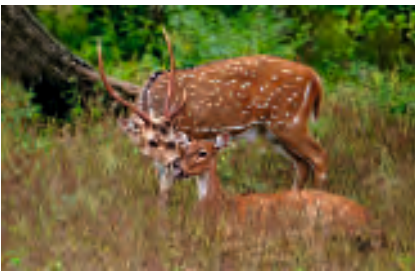
தெரிந்து கொள்ளுங்கள்

இவரை

இவர் பெயர் செல்லி. இவர் பில்லூர் பகுதிக்கு உட்பட்ட கீழ் பில்லூர் கிராமத்தில் வாழ்ந்து வருகிறார். இவர் அந்த ஊரில் சிறு சிறு மருத்துவ மூலிகைகள் செய்து வருகிறார். அத்துடன் அந்த ஊரில் உள்ள சிறு குழந்தைகளுக்கு மூலிகை மருந்துகளை சொல்லி தருகிறார்.

மாண்கள் அதிகமாக இரவில் கத்தினால் சிறுத்தை, புலி அருகில் இருப்பதாக அர்த்தம். மற்றும் வீடு அருகில் உள்ள ஆடு, மாடு வைத்திருப்பவர், எச்சரிக்கையாக இருக்க வேண்டும் என்று அர்த்தம்.

இந்த மாதத்தில் பில்லூர் பகுதியில் அதிகமான வண்ணத்து பூச்சிகள் காணப்பட்டன. அவை மிகவும் அழகாகவும், கூட்டமாகவும் காணப்பட்டன.



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கண்ணால் பார்த்ததும் காதால் கேட்டதும்

இந்த மாதம் பில்லூர் கீஸ்டோர் அலுவலகத்தில் மிகவும் அதிகமான நெல்லிக்காய் பார்த்தோம். அத்துடன் அதன் பயன்களையும் கேட்டு தெரிந்து கொண்டோம். காட்டிற்கு செல்லும்போது சாப்பிட்டால் தண்ணீர் தாகம் அதிகம் எடுக்காது. இதன் கிளைகளை வெட்டி தண்ணீரில் இட்டு, சிறிது நேரம் கழித்து தண்ணீர் குடித்தால் உடல் நலத்திற்கு நல்லது.



இம்மாதம் காட்டில் கிடைக்கும் பொருட்கள்

1. முன்னை கீரை
2. முஸ்டை கீரை
3. முன்னாங்கன்னி கீரை
4. சீங்கை கீரை
5. காக்கை டாகு
6. நெல்லிக்காய்
7. சீனி மிளகாய்
8. அரிசி காளான்
9. புத்து காளான்
10. மர காளான்





ನಿಸರ್ಗ ಸುದ್ದಿ

ಪುಣಜನೂರು ಮಕ್ಕಳು ಸಿದ್ಧಪಡಿಸಿದ ಮಾಸಿಕ ಪರಿಸರ ಸುದ್ದಿ



ಕುತೂಹಲಗಳು:

ಕಾಡಂಚಿನ ಜಮೀನುಗಳಲ್ಲಿ ದಿನಾ ಬೆಳಿಗ್ಗೆ ಕೋತಿಗಳು ಜೋಳ, ರಾಗಿಯನ್ನು ತಿನ್ನಲು ಬರುವುದು. ನಂತರ ಮಾನವನ ಗೊಂಬೆಯ ಚಿತ್ರವನ್ನು ಮಾಡಿ ಓಡಿಸುವರು ಮತ್ತು ತಗಡಿನ ತಟ್ಟೆಯನ್ನು ಕಟ್ಟಿ ಶಬ್ದ ಮಾಡಿ ಓಡಿಸುವರು.

ಪ್ರಾಣಿಗಳ ಚಲನವಲನ

ಆನೆ ಮತ್ತು ಹಂದಿಗಳು ಅಧಿಕವಾಗಿರಾಗಿ ಜೋಳ ತಿಂದು/ತುಳಿದು ನಾಶಮಾಡುತ್ತಿವೆ. ಪುಣಜನೂರು ಭಾಗದ ಮುನೇಶ್ವರ ಕಾಲೋನಿ, ಹೊಸಪೋಡು, ಎತ್ತೇಗೌಡನದೊಡ್ಡಿ ಈ ಗ್ರಾಮಗಳಲ್ಲಿ ಆನೆಗಳು ನುಗ್ಗಿ ರಾಗಿ ಮತ್ತು ಜೋಳವನ್ನು ನಾಶ ಮಾಡಿವೆ.



ಮುಖ್ಯ ಸಮಾಚಾರಗಳು

ದಿನಾಂಕ 13/09/2013 ರಂದು ಮಹಾತ್ಮಗಾಂಧಿ ರಾಷ್ಟ್ರೀಯ ಉದ್ಯೋಗ ಖಾತ್ರಿ ಯೋಜನೆಯ ಬಗ್ಗೆ ಪುಣಜನೂರು ಪಂಚಾಯತಿಯ ತೆಂಗಿನ ನಾನಿನ ನಿಗಮದ ಗೋದಾಮಿನಲ್ಲಿ ಗ್ರಾಮ ಸಭೆಯು ನಡೆಯಿತು. ಕೃಷಿ, ನೀರಾವರಿ, ತೋಟಗಾರಿಕೆ ಇಲಾಖೆಯ ಅಧಿಕಾರಿಗಳು ಮತ್ತು ಅಧ್ಯಕ್ಷರು, ಸದಸ್ಯರು ಹಾಗೂ ಸುತ್ತಮುತ್ತಲ ಗ್ರಾಮಸ್ಥರು ಹಾಜರಿದ್ದರು, ಭಗವಾನ್ ಮಹಾವೀರ್ ದರ್ಶನ್ ಕಣ್ಣಿನ ಆಸ್ಪತ್ರೆ, ಮೈಸೂರು. ಇವರು ದಿನಾಂಕ 23/9/2013 ರಂದು ಕೋಳಿಪಾಳ್ಯದಲ್ಲಿ ಉಚಿತ ಕಣ್ಣಿನ ತಪಾಸಣಾ ಶಿಬಿರವನ್ನು ಏರ್ಪಡಿಸಲಾಗಿತ್ತು.

ಮುಂದಿನ ತಿಂಗಳು

4 ಗ್ರಾಮದಲ್ಲಿ ಗ್ರಾಮದ ಹಿರಿಯರು ವಿಧ್ಯಾರ್ಥಿಗಳನ್ನು ಕಾಡಿಗೆ ಕರೆದುಕೊಂಡು ಹೋಗಿ ಔಷಧ ಸಸ್ಯಗಳ ಉಪಯೋಗಗಳ ಬಗ್ಗೆ ಮಾಹಿತಿ ತಿಳಿಸುವುದು. ಪುಣಜನೂರು ಮತ್ತು ಕೋಳಿಪಾಳ್ಯದ ಸರ್ಕಾರಿ ಶಾಲೆಗಳಲ್ಲಿ ಪರಿಸರ ಸಂರಕ್ಷಣೆ ತರಗತಿಯನ್ನು ನಡೆಸುವುದು. ಪುಣಜನೂರು ವಿಭಾಗದ ಹೆಚ್ಚಿನ ಸಂಗ್ರಹಗಾರರ ಸಭೆ ನಡೆಸುವುದು. ಅರಣ್ಯ ಹಕ್ಕು ಸಮಿತಿಯ ಸಭೆ ನಡೆಸುವುದು.

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ಮಾಡಿದ್ದು

19/10/2013 ರಂದು ಕೀಸ್ಟೋನ್ ಫೌಂಡೇಷನ್ ನ ವತಿಯಿಂದ ಪುಣಜನೂರು ವಿಭಾಗದ 6 ಮತ್ತು 10 ನೇ ತರಗತಿಯ 30 ವಿಧ್ಯಾರ್ಥಿಗಳನ್ನು ಒಂದು ದಿನದ ವೈಸೂರು ಪ್ರವಾಸವನ್ನು ಹಮ್ಮಿಕೊಳ್ಳಲಾಯಿತು. ಸಂಪಿಗೆ ಮೌಲ್ಯ ಸೇರ್ಪಡೆ ಕೇಂದ್ರದಲ್ಲಿ ಜೇನು ಸಂಸ್ಕರಿಸಿ ಬಾಟಲಿ ಮಾಡಿ ಮಾರಾಟ ಮಾಡಲಾಗುತ್ತಿದೆ.

25/10/2013 ಅರಣ್ಯ ಹಕ್ಕು ಸಮಿತಿ ಸಭೆಯನ್ನು ಬೇಡಗುಳಿಯಲ್ಲಿ ನಡೆಸಲಾಯಿತು.

16/11/2013 ರಂದು ಹೊಸಕೆರೆ ಭಾಗಕ್ಕೆ ಶ್ರೀನಿವಾಸಪುರ ಕಾಲೋನಿಯ ವಿಧ್ಯಾರ್ಥಿಗಳನ್ನು ಹೊರಸಂಚಾರಕರೆದುಕೊಂಡು ಹೋಗಲಾಯಿತು.

ಹೊಸಪೋಡು ಮತ್ತು ಶ್ರೀನಿವಾಸಪುರ ಕಾಲೋನಿಯಲ್ಲಿ ಗ್ರಾಮದ ಹಿರಿಯರು ಗ್ರಾಮದ ವಿಧ್ಯಾರ್ಥಿಗಳಿಗೆ ಔಷಧ ಸಸ್ಯಗಳ ಬಳಕೆಯ ಬಗ್ಗೆ ತಿಳಿಸಿ ಕೊಡಲಾಯಿತು.

ಕೋಳಿಪಾಳ್ಯ ಮತ್ತು ಪುಣಜನೂರು ಶಾಲೆಯಲ್ಲಿ ಪರಿಸರ ಸಂರಕ್ಷಣೆ ತರಗತಿಯನ್ನು ನಡೆಸಲಾಯಿತು.



ಇವರ ನೆಪ್ಪು ಇದೆಯಾ?

ಸಿದ್ದೇಗೌಡ, ೩೫ ವರ್ಷ: ಇವರು ಹುಟ್ಟಿದ್ದು ಪುಣಜನೂರು ಭಾಗದ ಜೇಗಟೆ ಪೋಡಿವಿನಲ್ಲಿ ಇವರ ತಂದೆ ಜವನೇಗೌಡ ತಾಯಿ ಜಡೇಮಾದಮ್ಮ. ಅರಣ್ಯ ಭೂಮಿಯಲ್ಲಿ ಇವರು ವ್ಯವಸಾಯ ಮಾಡುತ್ತಿದ್ದರು ಪ್ರಮುಖ ಬೆಳೆಗಳೆಂದರೆ, ರಾಗಿ, ಜೋಳ ಅವರೆ, ತೊಗರಿ, ಕಾಫಿ, ಬಾಳೆ ಇತ್ಯಾದಿ ಬೆಳೆಗಳನ್ನು ಬೆಳೆಯುತ್ತಿದ್ದರು. ಇವೆಲ್ಲವನ್ನು ಸ್ವಂತ ಬಳಕೆಗಾಗಿ ಬಳಸುತ್ತಿದ್ದರು.

ನಂತರ ಇವರ ಹತ್ತನೆಯ ವಯಸ್ಸಿಗೆ ಗದ್ದೆಸಾಲಿಗೆ ಹೋಗಿ ವಾಸವಾದರು ಕೆಲವು ವರ್ಷಗಳ ನಂತರ ಮುಣ್ಣುಕೈ ಪೋಡು, ಬೇಡಗುಳಿ ಗ್ರಾಮಗಳಲ್ಲಿ ವಾಸವಾಗಿದ್ದರು. ನಂತರ ಸಿದ್ದೇಗೌಡರು ಬೇಡಗುಳಿಯಲ್ಲಿ ಬಂದು ಮದವೆಯಾದರು. ಈಗ ಇವರು ಬೇಡಗುಳಿಯ ಮಾರಿಗುಡಿ ಪೋಡಿನಲ್ಲಿ ವಾಸವಾಗಿದ್ದಾರೆ. ಈಗ 3 ಜನ ಗಂಡು ಮಕ್ಕಳು ಒಬ್ಬ ಹೆಣ್ಣು ಮಕ್ಕಳಿದ್ದಾರೆ. ಇವರು ಮನದೇವರಾದ ಗುಂಡತ್ತಿದ ಗುರು ಸಿದ್ಧಪ್ಪ ದೇವರನ್ನು ಪೂಜಾರಿಯಾಗಿ ಪೂಜೆ ಮಾಡುತ್ತ ಬರುತ್ತಿದ್ದಾರೆ. ಅದಲ್ಲದೆ ಗೋರುಕನ, ಹಾಡುಕ, ಓಲಗದಲ್ಲಿ ಬಾಲ್ಯದಿಂದಲೂ ಪಾರಂಪರಿಯಾಗಿ ಹೆಸರುವಾಸಿಯಾಗಿದ್ದಾರೆ. ಈಗ "ಕಾಡಸಂಪಿಗೆ ಕಾರ್ಯ ಕಲಾ ತಂಡ"ವನ್ನು ರಚಿಸಿಕೊಂಡು ಪಟ್ಟಣಕ್ಕೆ/ಸಭೆ ಸಮಾರಂಭಗಳಿಗೆ ಗೋರುಕನ ಕಾರ್ಯಕ್ರಮಗಳನ್ನು ಮಾಡಿಕೊಂಡು ಸೋಲಿಗ ಸಂಸ್ಕೃತಿಯನ್ನು ಉಳಿಸುತ್ತಾ ಬರುತ್ತಿದ್ದಾರೆ.

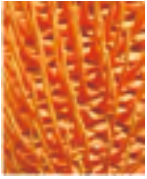


ಈ ತಿಂಗಳು

ಸೊಡಲಿ ಹೂ, ಕಾಡಿಂಬಿ ಹೂ, ಬೈಸೆ ಹೂ, ಮುಸ್ತಕ ಹೂ, ಎರಕು ಹೂ, ತಾರಿ ಕಾಯಿ, ಅಣಿಲೆ ಕಾಯಿ, ಈ ತಿಂಗಳು ಸೋರೆ ಹಕ್ಕಿಯು ಮೊಟ್ಟೆ ಇಟ್ಟು ಕಾವು ಕೊಡುವ ಸಮಯ.

ನಿಮಗೆ ಗೊತ್ತಿದೆಯೇ ?

ಕಾಡು ಪ್ರಾಣಿಗಳು ಜಮೀನುಗಳಿಗೆ ನುಗ್ಗಿರಲು ಬೇಲಿ ಸುವಾರು ಎರಡುವರೆ ಅಡಿಯಿಂದ ಮೂರು ಅಡಿಯ ವರೆಗೆ ಸಾಲಾಗಿ ಜಮೀನು ಸುತ್ತ ಜೂಜಕ್ಕಿ ಕಡ್ಡಿಯನ್ನು ನೆಡುವುದರಿಂದ ಹಂದಿ, ಮುಳ್ಳಂದಿ ಯಂತಹ ಪ್ರಾಣಿಗಳಿಂದ ಬೆಳೆ ನಾಶವನ್ನು ತಡೆಗಟ್ಟಬಹುದು.



കാട്ടുപൂവ്

നിലമ്പൂരിലെ കുട്ടികൾ തയ്യാറാക്കിയ പരിസ്ഥിതി മാസിക



നാട്ടുവിശേഷം

ജൂലൈ, ഓഗസ്റ്റ് സെപ്റ്റംബർ മാസങ്ങളിൽ മഴ ശക്തിയായി പെയ്തു. നിലമ്പൂരിലെ മിക്കവാറും എല്ലാ ആദിവാസി ഉരുക്കളിലും മഴക്കാലരോഗങ്ങൾ പടർന്ന് പിടിച്ചിരുന്നു. ജനങ്ങളെല്ലാം ജോലിക്ക് പോവാൻ കഴിയാതെ ബുദ്ധിമുട്ട് അനുഭവിച്ചു. സെപ്റ്റംബർ മാസം നെടുങ്കയം കോളനിയിൽ വിപുലമായി ഓണാഘോഷം നടത്തുകയും പൂക്കളെമാറുകയും ചെയ്തു. പാട്ടക്കരിമ്പ് കോളനിയിൽ ഒക്ടോബർ മാസം എല്ലാ ഉരുമുനിവാസികൾക്കും അര ഏക്കർവീതം ഭൂമി വനാവകാശ നിയമപ്രകാരം ലഭിച്ചു. ബഹുമാനപ്പെട്ട പട്ടിക വർഗ്ഗ വകുപ്പുമന്ത്രി കുമാരി പി.കെ ജയലക്ഷ്മി പട്ടയവിതരണ കർമ്മം ഉദ്ഘാടനം ചെയ്തു. അന്നേ ദിവസം പാട്ടക്കരിമ്പ് ആദിവാസി വനസംരക്ഷണസമിതി നിർമ്മിച്ചു നൽകിയ കമ്മ്യൂണിറ്റി സെന്റർ ബഹുമാനപ്പെട്ട വൈദ്യുതി വകുപ്പ് മന്ത്രി ശ്രീ. ആര്യടൻ മുഹമ്മദ് സമുദായത്തിനായ് തുറന്നുകൊടുത്തു.

കാട്ടുവിശേഷം

ഈ വർഷം മുണ്ടക്കടവ്, പുലിമുണ്ട, ഉച്ചക്കുളം തുടങ്ങിയ ഇടങ്ങളിൽ ധാരാളമായി നെല്ലിക്ക ഉണ്ടായിട്ടുണ്ട്. ഈ കോളനികളിലുള്ള നിരവധിപേർ നെല്ലിക്ക ശേഖരണത്തിൽ ഏർപ്പെട്ടിട്ടുണ്ട്. വളളിക്കെട്ട് അറനാടൻ കോളനിയിലുള്ളവരും വനത്തിൽ നിന്ന് ധാരാളം നെല്ലിക്ക ശേഖരിച്ചു വിൽക്കുന്നു. കിലോഗ്രാമിന് 25 രൂപ തോതിലാണ് നെല്ലിക്ക വിപണനം ചെയ്യുന്നത്. ഈ വർഷം കുമ്പളപാറയിൽ നിന്ന് ഏതാണ്ട് മൂന്നുറോളം കിലോഗ്രാം ചെറുതേൻ ശേഖരിച്ചു.



ഇവർ ഇങ്ങനെ?

മാധവി - നെടുങ്കയം പണിയ കോളനിയിലുള്ള മാധവിക്ക് ഏകദേശം 60 വയസ്സ് പ്രായമുണ്ട്. കാട്ടിലുള്ള വിവിധ മരുന്നുചെടികളെക്കുറിച്ചും വന ഭക്ഷ്യ വിഭവങ്ങളെക്കുറിച്ചും ഇവർക്ക് നല്ല ധാരണയുണ്ട്. നെടുങ്കയം ബദൽസ്കൂൾ വിദ്യാർത്ഥികൾക്ക് ഇവരുടെ അറിവ് പകർന്ന് നൽകാൻ ഇവർ സമയം കണ്ടെത്താറുണ്ട്. നെടുങ്കയത്ത് കീസ്റ്റോൺ ഫൗണ്ടേഷൻ നടത്തുന്ന മുതിർന്നവർ ചെറുതലമുറക്ക് പാരമ്പര്യ അറിവുകൾ പകർന്നു നൽകുന്ന പ്രോഗ്രാമിൽ ഇവർ പ്രധാന പങ്കാളിയാണ്.

വിരുന്നുകാർ

- ആന - 20 തവണ
- കൊമ്പൻ - 20 തവണ
- ആനക്കുട്ടം (7എണ്ണം) - 12 തവണ

Sunil is the Coordinator for activities at the Village Conservation Centre, Keystone Foundation, Nilambur

പക്ഷികൾ

ഇരട്ടതലച്ചി, എല്ലാദിവസവും, ആനറാബി, മണ്ണാത്തിപുള്ളി, കാലികൊക്ക്, ചാരമുണ്ടി, ഓലേഞ്ഞാലി, തേൻകുരുവി, ചെമ്പോത്ത്, മരംകൊത്തി, നീർകാക്ക അരിപ്രാവ്, പുത്താങ്കീരി, പൊന്മാൻ

തന്ത്രങ്ങൾ

- 1) ആനച്ചുവടി സമൂലം അരച്ച് മുറിവിൽ പുരട്ടിയാൽ വിഷജന്തുക്കളുടെ കടിമൂലമുള്ള വിഷം ശമിക്കും. മുറിവുണ്ടാകും.
- 2) ആനച്ചുവടിനീരും കടുക്കാതോടും അരച്ചു ചേർത്താൽ കഴിച്ചാൽ അഞ്ചാംപനി മാറും.
- 3) ആനച്ചുവടി സമൂലം വെന്ത കഷായം കുടിച്ചാൽ ആമാശയ രോഗങ്ങളും അർശസും ശമിക്കും.



അറിഞ്ഞോ?

- 1) മുണ്ടക്കടവിലും മാഞ്ചീരിയിലും എല്ലാം മാവോയിസ്റ്റ് ഭീഷണി. ഊരിലുള്ളവരിൽ നിന്നും അരിയും മറ്റു ഭക്ഷ്യ സാധനങ്ങളും വാങ്ങിക്കൊണ്ടു പോവുകയും ലഘുലേഖകൾ വിതരണം ചെയ്യുകയും ചെയ്തതായി പറയപ്പെടുന്നു. പോലീസ് സേന ഇവർക്കായി തിരിച്ചിൽ നടത്തി വരുന്നു.
- 2) നിലമ്പൂർ മേഖലയിലെ കാട്ടുനായ്ക്ക ചോലനായ്ക്ക വിഭാഗങ്ങൾക്ക് പി. വി. ടി. ജി പദ്ധതിയിലൂടെ അരിയും ഭക്ഷ്യധാന്യങ്ങളും വിതരണം നടത്തി. മുണ്ടക്കടവ്, കുമ്പളപാറ എന്നീ ഉരുക്കളിൽ ആരോഗ്യക്യാമ്പുകളും സംഘടിപ്പിച്ചു.
- 3) നെടുങ്കയം ബദൽസ്കൂൾ വിദ്യാർത്ഥികൾക്കായ് ശുദ്ധജല ജൈവവൈവിധ്യങ്ങളെ കുറിച്ച് പരിസ്ഥിതി ക്ലാസ് നടന്നു. 15 ഓളം വിദ്യാർത്ഥികൾ ക്ലാസിൽ പങ്കെടുത്തു.





Pollination strategies of weed species

K.R. Shivanna

Our response to weeds varies from indifference to dislike. We don't look at them with any sense of appreciation. Weeds are more successful than non-weedy species; they seem more 'intelligent' in exploiting available resources for their survival, reproduction and spread. They thrive in disturbed habitats - agricultural and fallow lands, waste lands, along the road sides and in degraded forests. They don't grow in areas where natural succession has reached the peak. Although most of them are native to Tropical America and Africa, they have become naturalized in India, composing nearly 40% of our flora.

One of the definitions of a weed is: "a plant growing where it is not desired". Weeds tend to be invasive and noxious. They outcompete native species for resources and pollinators, eventually impacting native biodiversity, bringing about considerable changes in the forest structure. Undisturbed forests with closed canopies are generally free from invaders, but in disturbed forests they begin invasion along the edges, roads and gaps and spread rapidly. *Lantana camara*, *Parthenium hysterophorus*, *Mikania micrantha*, *Chromolaena odorata* and *Eichhornia crassipes* (water hyacinth) are examples.

Adaptive traits

Weeds capture resources (light, moisture and nutrients) efficiently because of their early germination, rapid seedling growth, large leaf area and massive root system. Most of them are not palatable to grazing livestock, being armed with deterrents such as spines/thorns/prickles or chemical repellents. They are able to withstand extremes such as drought through

phenotypic plasticity. They grow rapidly through vegetative phase and shift early to flowering phase; and continue to produce seeds as long as the growing conditions permit. The seeds remain dormant in the soil for years. Also, all seeds don't germinate at one time even when conditions are favourable; they germinate sporadically at successive growing seasons. This way they can survive even if all germinated seedlings were to die.

The most important evolutionary adaptation in weeds seems to be 'reproductive assurance' through autogamy (self-pollination within the flower), apomixis (seed development without fertilization) and vegetative propagation.

Pollination becomes a major limitation when pollinators become scarce or the density of conspecific plants becomes low. The limitation is accelerated in degraded and fragmented habitats. Many plants evolve autogamous mode of pollination to overcome pollination constraints. This shift from out crossing to autogamy is a frequent evolutionary change recorded particularly in invasives. Shifting the breeding system requires changes in several floral traits: i) pollen release and stigma receptivity must be synchronised, ii) anthers and the stigma need to be positioned close to each other to facilitate

selfing and iii) complete or partial self-compatibility to permit production of sufficient selfed seeds.

Autogamous species can set seeds independent of the presence of pollinators or the density of conspecific plants. Thus, evolution of autogamy provides reproductive assurance to the species. Although self-pollinated, many species opt for crossing when pollinators are available. In autogamous species there is also the advantage that dispersal of even a single seed to a new location can establish a viable population, since the plants don't require pollinators or other conspecific plants to set seeds.

Reproductive assurance through selfing also allows the species to allocate fewer resources: flowers need not

be large and showy to attract pollinators and they don't need to produce nectar. Pollen grain production is also reduced. As expected, many autogamous weeds have small, inconspicuous flowers with no or little nectar.

Inbreeding depression can be a problem faced by autogamous species and can result in reduced vigour when compared to out crossing species. But weeds, as we see, have flexible mating systems, offering some degree of heterozygosity in the species. Even when populations suffer some inbreeding depression, the benefits of autogamy with assured seed set irrespective of pollination environments is large enough to compensate adequately the inbreeding depression. In order to survive and spread, weeds seem to have opted for the autogamous pathway rather than maintaining vigour at the cost of

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Butterflies are abundant visitors and efficient pollinators of *Lantana camara*.

Diary of Nilgiri Natural History Society



Community Seed exchange

Looking after seeds from the backyard or the farm is a wonderful skill. Seeds are meant to be saved so that there is never a shortage of food in the next sowing season. Seeds are to be exchanged within and between communities so that their amazing diversity is maintained and they are multiplied and distributed.

The tradition of seeds being passed down generations is almost a lost art today.

We live in times when genetically modified and hybrid seeds have led to the loss of close to 75% of crop genetic diversity.

In an effort to combat the genetic erosion of agro biodiversity the Nilgiri Natural History Society organized a community seed exchange at the Bee Museum, Ooty on the 18th of October. Several farmers from the Pillur, Sigur and Kotagiri regions participated in the exchange. The event started off with a presentation by Mr. Robert Leo, a founder member of the NNHS on the importance of seed saving and agro biodiversity protection followed by the exchange itself. Several seeds, including millets, beans, flowers and vegetable varieties were exchanged on that day.

To further this cause the NNHS plans on having a seed bank at the Bee Museum. A seed bank can be compare to a savings account. Seeds are "deposited" into the seed bank with the intention of "withdrawing" them in the future when they are needed. Individuals interested in being a part of this can get in touch with us at contact@nnhs.in

Biodiversity & conservation workshop for kids

A program on biodiversity and conservation was held at the Bee Museum for children from the villages surrounding Sigur on the 21st of July. The NNHS teamed up with Bravin Kumar from the Zoo Outreach organization to conduct this daylong program which included several presentations, short movie screenings and games. Special emphasis was paid to small mammals and their conservation. In the end all thirty-seven students took a pledge to protect their environment.



Art for Tigers

On the International day of the Tiger- 29th July'2013, the NNHS organized an art competition cum exhibition titled 'Art for Tigers' at the Bee museum. Hillfort Matriculation School-Kotagiri, Riverside Public School-Kotagiri and St. Thomas School-Gudalur sent in their entries. The works of art were judged based on creativity and their understanding of the theme - Tigers and their conservation. A documentary film titled Truth about tigers by Shekar Dattatri was also screened for the visitors.

Talk on Orchids

A talk on orchids took place at the Bee museum on the 4th of September. The speaker, Mr. Nimal Kumar, an orchid enthusiast and vertical gardening expert introduced the participants to the basics of orchid taxonomy. His talk covered various characteristics of these complex plants. He also brought several species including some native ones, which he exhibited. The talk ended with him giving the participants advice on how to care for orchids.



Learning through Conservation Education

A talk on Conservation Education (CE) took place at the Bee museum on the 10th of August 2013. The speaker was NimeshVed, an independent consultant who has been working in the field of CE for the past several years. He shared some stories from Mizoram where he did a great deal of outreach work with schools and villages. He is currently helping to streamline the NNHS CE program.

Why Insects Matter

Dr. Meenakshi Venkatraman, a population ecologist, who has studied insect dynamics mainly in the field of biological control, gave a talk on insects on the 6th of June. Her talk introduced audiences to the common insects around us, with a special emphasis on their ecological roles. The talk was an effort to bring about awareness into the microscopic world of insects without which we cannot live. She took the audience through a series of slides showcasing different species and their characteristics. It was an inspiring talk, which made us look at these creatures in a completely different light.

Happenings at the Bee Museum, Ooty

The Bee Museum at Ooty is an initiative of Keystone Foundation. Inaugurated in October 2006 by the then Secretary, Minister of Tribal Affairs, Ms. Meena Gupta, the museum, first of its kind with a focus on honey bees of India, tells of the ecology of the Nilgiri Biosphere Reserve and the livelihoods of the honey gatherers. The museum has a steady flow of visitors and activity modules for children.



Teacher training program on Freshwater Biodiversity Conservation

Freshwater ecosystems are essential for human survival, providing a large part of people's drinking water. These ecosystems are homes to several species of fish, amphibians, invertebrates, birds and mammals. Despite their importance, these ecosystems are constantly under threat from anthropogenic pressures. Several species of fish and amphibians have become extinct in recent decades. While a lot has been done for the conservation of large mammals like the tiger and elephant hardly any conservation efforts have been made for the smaller species that inhabit these ecosystem even though they play a vital role in the proper functioning of this ecosystem.

In an effort to raise awareness on issues related to freshwater and its biodiversity, the Zoo Outreach Organization (ZOO) and Nilgiri Natural History Society (NNHS) organised a teachers training program on the



subject of 'Freshwater Biodiversity Conservation' on 5th November 2013 at Keystone Foundation, Kotagiri. Following the 2011 IUCN Freshwater Biodiversity Assessment Report, the Zoo Outreach Organization conceived and developed a teaching manual to help educators address issues around freshwater species conservation. With a focus on innovative teaching techniques, Dr. B.A. Daniel from ZOO conducted a series of active learning activities on themes ranging from the history of Western Ghats to the current threats faced by the region's diverse habitats such as forests and wetlands. There were also introductory guides to understanding four freshwater groups and their conservation significance – Odonates, Fish, Snails and Aquatic plants.

There were 46 participants, mostly teachers and conservation educators from various institutes – Government Arts College Ooty, Alpha GK School, Hillfort School, Sarva Shiksha Abhiyan, Lawrence School Ooty, Riverside Public School Kotagiri, P.U.S. Kattabettu, Department of Horticulture, Education Department, Kotagiri, Forestry College Mettupalayam and Keystone Foundation. All participants received a copy of the teaching manual and at the end of the workshop, pledged to commit themselves to the cause of conservation.



Night Trail

A night trail was organized by the NNHS from Hallakarai to the Pachakad estate on the 28th of August. The participants discovered a completely different world that came alive after dark. Several species of arachnids were spotted along with toads and frogs.

The newsletter of the Nilgiri Natural History Society (NNHS) aims to cover the many dimensions of natural history - conservation issues, lay observation, cultural representations and traditional knowledge. The newsletter will carry communications about research in Keystone Foundation in the areas of conservation, environmental governance, culture, livelihoods and enterprise. In keeping with the pan Nilgiri Biosphere Reserve (NBR) nature of the Society, space will be allocated for reporting of events/views from elsewhere within the country and from outside the country. Additionally a section will be devoted to research summaries by students who work in the region of the NBR. Guest editors will be invited for special editions. News items gleaned from printed sources about the NBR will be featured. Separate sections will carry information on NNHS and Bee Museum activities. The species focus will feature species of special conservation status, endemic to the Western Ghats and present in the NBR.

SUBMISSION OF ARTICLE

The NNHS newsletter articles are reviewed by the Chief Editors and a member of the editorial board

Articles are invited for the following section: i. Natural History News from India (400 words); ii. Natural History News from the World (400 words); iii. Research Initiatives in the NBR - student contributions (400 words); iv. Species focus (250 words)

Articles should be submitted by email to: anita@keystone-foundation.org or archana@keystone-foundation.org

Authors should provide complete information including an email address and phone numbers. Articles need to be submitted in standard word processor formats only. Rich text content and other forms are not accepted. Figures and texts need to be sent in separately with adequate labelling and numbering in context to the articles sent. Pictures in the manuscript also need to be sent in separately in TIFF, JPEG or PNG formats with resolution not less than 250 dpi

Reference style:

Papers in Journals and other periodicals

Hanely, T.A. and Hanley, K.A. 1982. Food resources partitioning by sympatric ungulates on Great Basin rangeland. *Journal of Range Management* 35: 152-158.

Papers in Edited Books, Symposia Proceedings, etc

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Lieth, H. and Whittaker, R.H. (eds.). 1976. *Primary Productivity of the Biosphere*. Springer-Verlag, Berlin.

Reports, Dissertations, etc

Sollins, P., Reichle, D.E. and Olson, J.S. 1973. *Organic Matter Budget and Model for a Southern Appalachian Liriodendron Forest*. Oak Ridge National Laboratory, Oak Ridge, U.S.A.

Funambulus sublineatus

Photo credit: NA Naseer



Common name: Dusky-striped Squirrel

Distribution: Endemic to southern India and Sri Lanka (Molur et al. 2005; Thorington and Hoffmann 2005) at elevations of 200 to 1,200 m asl.

Habit and Habitat: This species is restricted to riparian habitats, especially reedbeds, in tropical evergreen and moist deciduous forest. In Sri Lanka, it is associated with wetlands in low country wet to mid montane wet zone (Molur et al. 2005) and in bamboo jungles. In the Western Ghats it is associated with *Ochlandra* sp. reedbeds in moist forests. It is one of the rarest and most shy *Funambulus* species that is usually confused with *Funambulus layardi* in Sri Lanka and *Funambulus tristriatus* in India.

Status: Listed as Vulnerable because it is confined to riparian habitats, and has an area of occupancy of probably less than 2,000 km² in total, its distribution is severely fragmented, and there is continuing decline in the extent and quality of its habitat.



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