



TAMILNADU FOREST DEPARTMENT



வரையாடு VARAIYAADU

THE OFFICIAL NEWSLETTER OF PROJECT NILGIRI TAHR

PROJECT NILGIRI TAHR

**SAVE OUR STATE ANIMAL
OUR NILGIRI TAHR, OUR PRIDE**



DIRECTOR'S MESSAGE

I am delighted to share the second edition of the 'Project Nilgiri Tahr' Newsletter, 'VARAIYAADU'. This issue reflects the research progress of Project Nilgiri Tahr- country's first iconic project to conserve the endemic mountain ungulate- Nilgiri Tahr. As a remarkable progress, the first synchronized survey of Nilgiri Tahr was successfully conducted in coordination with Kerala Forest department and other organizations like WII, AIWC and WWF-India. The population estimation methodology for synchronized survey was determined based on the results of a pilot study conducted to compare the pros and cons of four different methodologies. For the first time, a Nilgiri Tahr was successfully Radiocollared to assess the home range and to study the behaviour ecology. Also, mystery revealed for lump disease in Nilgiri Tahr. This quarterly newsletter covers salient findings and research progress, astonishing field observations of researchers and outreach programs. We look forward for new ideas and innovative solutions and strive to work hard to conserve Tamil Nadu's State Icon-Nilgiri Tahr.



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OUR VISION

Our vision is to be a hub for passionate individuals, conservationists, and communities united in their commitment to safeguard the Nilgiri Tahr and its unique ecosystem.

OUR MISSION

Our mission is to excel in the conservation and protection of Nilgiri tahr, an iconic species endemic to the Western Ghats



APR - JUNE 2024

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சங்க இலக்கியத்தில் வரையாடிகள்

பாகம் II

தமிழ் மொழியில் மகவும் தொன்மை வாய்ந்த இலக்கியங்களான ஐம்பெருங்காப்பியங்கள், பத்னெய்திமேற்கணக்கு நூல்கள் மற்றும் சிற்றலக்கியங்கள் போன்றவற்றில் வரையாடுகள் 'வருடை' என்னும் பெயரால் அழங்கப்பட்டுள்ளன. அதன் வாழிடங்கள் பற்றிய குறிப்புகளும் இடம்பெற்றுள்ளன.

“நெடுவரை மகையது குறுங்கால் வருடை”

ஐங்குறுநூறு, 287.,

“அண்ணலாங்கு குன்றத்தெயில் வருடைபாய்ந் துழக்கலன்”

சிந்தாமணி, 1899.,

வரையாடுகள் உயரமான மலைகள் [மகை-மலை] மற்றும் குன்றுகளின் மேல் உளவும் அன்புதனை மேற்கூறிய ஐங்குறுநூறு மற்றும் சிந்தாமணி நூல்களில் இடம்பெற்றுள்ள வரையாடுகள் மூலம் அறியலாம். மேலும் வரையாடுகள் செங்குத்தான [செங்குதரை] மலைப்பகுதிகளில் வாழ்வதாகவும், 'பெருவரை'யில் குதப்பதாகவும் பின்வரும் குறுந்தொகை பாடல் அளக்குகிறது.

“செங்குதரைச் செக்கை வருடை மான்மந்

சுரைபொழி தீம்பா லார மாந்தி

பெருவரை நீடி வுகளு நாடன்”

குறுந்தொகை, 187.,

“வேறுவேறு நனத்த வரைவாழ் வருடை
கோடுமுற் றளந்தகர்ப் பாடுகிறந் தியல்”

அகம், 378

வரையாடுகள் மலைகளில் வாழும் அன்புதனை அகநானூற்றின் 378-ஆம் பாடலிலும், மலைபடுகடாம் நூலின் 503-ம் பாடலிலும் “வரைவாழ் வருடை” என்ற தொடரின் மூலம் அறியலாம்.

கம்பர் இயற்றிய இக்காசு காப்பியமான கம்பராபியணத்திலும் “மருகை மால்வரை உம்பரில் குதிக்கின்ற வருடை” என்ற தொடரின் மூலம் வரையாடுகள் உயர்ந்த மலைகளில் தாங்கள் குதிக்கும் அன்புதனை அறியலாம்

“மகையாடு சீமை மால்வரைக் கவாஅன்

வரைவாடு வருடைத் தோற்றம் போல”

பட்டினப்பாலை, 138-139.,

மேற்கண்ட தொடர் இடம்பெற்றுள்ள சங்க நூலான பட்டினப்பாலையின் வரையாடுகளின் தோற்றம் மற்றும் அதன் வாழிடங்களை பற்றி உருத்திரங்கண்ணனார் குறிப்பிட்டுள்ளார்.

“கிருஷ்ணாங்கு கிறுவரை உர்பு கிழிய ஆடும்

வருடை மான் குழுவிய வளமலை நாடனே”

-[கல்.43]

மூங்கில் மசைந்த முடிந்தா எரும்படி

.....

வருடை மடமநர் யூர்ந்தைத் துஞ்சம்
கிருள் தூங்கு சோலை இலங்குநீர் வெற்பு

-[கல்.50]

மேற்கண்ட கல்தொகைப் பாடல்களில் கருமகங்களின் கிருள் கூழ்ந்த மலைச்சரிவுகளில், வரையாடுகளின் குட்டிகள் வளையாடும் ஏனும் கிருள் கூழ்ந்த சோலைகளில் யானைகருடன் உறங்கும் ஏனும் கயலர் உரைக்கிறார்.

மேலும் பிற சங்க நூல்களான கல்தொகை மற்றும் சீவகசிந்தாமணியில் 'சாரல் வருடை' என்றும் 'சலம்புபாய் வருடை' என்றும் வரையாடுகளின் வாழ்ந்தலங்கள் பற்றிய குறிப்புகள் கிடம் பெற்றுள்ளன.

மேலும் வரையாடுகள் மந்தைகளாக வாழ்வதை "கடும்பாட்டு வருடை" என சங்க நூல்கள் எடுத்துரைக்கின்றன.

“.....படம்பை
கீழ்முசும் பெருங்கலைடி நன்மேயல் ஆரும்
பன்மலர்க் காய்ப்பாற்று உம்பர்க் கருங்கலை
கடும்பாட்டு வருடையொரு தாவன உகளும்
பெருவரை நீழல் வருகுவன் குளையொடு
கூண்டிந் ததைந்த கண்ணியன் யாவது”

[நற்றணை, 179]

மேற்கண்ட பாடல் வரிகளில் வரையாடுகள் கருங்குரங்கோடு தாழ்க் குத்கும் என்ற மகவும் நுட்பமான சமீபத் கிடம்பெற்றுள்ளது.

“வருடையைப் பழமகன் வாய்ப்பு”

பர்பாடல் [11:5]

பர்பாடல் நூல்களிலும் வரையாடுகள் வருடை என்றே போற்றப்பட்டுள்ளதை அறியலாம்.

“வார்டோட்டு வயத்தகர் வாராது மாற்றுவன்
குருஉமயிர்ப் புருவை யாகைய னல்கு
மாஅி லருந்த் தண்டிபெருஞ் சலம்பு”

ஐங்குறுநூறு. 238

ஐங்குறுநூறில், 'தகர்' என்று ஆண் வரையாடுகளையும், 'புருவை' என்று பெண் வரையாடுகளையும் கிடை மாலகன் ஊழல் மலையல் வசிப்பதாகவும் கூட்டிக்காட்டப்பட்டுள்ளது. மேலும் மலைப்படுகடாம் நூலில் “வன்றலை மாத்தகர்” எனும் கூற்றில் வல்கையான ஆண் வரையாடுகள், மலைகளில் தலைகைய மோத் சண்டையிடும் என்பதை அறியலாம்.

வரையாடுகளின் சிறப்புகள், வாழ்ந்தலங்கள், பாலன் வகைப்பாடு மற்றும் அதன் குணங்கள் ஆகியவற்றைப் பற்றி எண்ணலடங்கா குறிப்புகள் சங்க நூல்களில் கிடம் பெற்றிருப்பதால், வரையாடுகள் தழுவிகளின் பண்பாடு மற்றும் வாழ்ந்தலலோடு நெருங்கிய தொடர்புகடையது என்பது வளங்குகிறது.

வருடை

ஆடு வரையாடு
அந்த மலையில் ஓடுது பாரு !
வளையாட ஓடுபோதும்
நீ நனைத்திட சவாது !
காடு அதன் வீடு
இங்கு மன்தன்ன் சுவடுகள் கேடு !
ஆடு வரையாடு
அது உலவீடும் அழகை பாரு !

பாறையில் சருக்கீ
வாழ்வனை சருக்கீ
வாழ்ந்திடும் சூழல்
கெடுத்தது பெரிய பாவமே !
காடும் மலைகளும் செழித்திட
இறைவன் படைத்தானே !
மன்தன் எல்லாம் அழித்தானே !
மலைகளை குடைந்து அரித்தானே !
பாறையின் மேலே ஓடிட இங்கே
கற்றுக்கொடுத்தது யாருங்க !
மன்தனைக் கண்பால்
ஓடி ஒள்வதை
அடிமைப்படுத்தியதாருங்க !
வேண்டாமய்யா விட்டுவிடுங்கள்
ஆயற்கையோடே வாழ விடுங்கள்....!

மலையில் வழுக்கீ
மலைச்சரிவில் இறங்கீ
எல்லை கடந்தது சாபமே !
புலிக்கு பயந்து புற்களை மேய்ந்து
தன்பது விருப்பமே !
யார் அடையுறும்ல்லா மலைகளில் வாழ்வதும்
அதன் விருப்பமே !
இவை மாநில விலங்காய்
இருப்பது தமிழ்நாட்டுக்கு
என்றும் பெருமை !
அதனை காப்பது உங்கள் கடமையே !
வேண்டாமய்யா விட்டுவிடுங்கள்
ஆயற்கையோடே வாழ விடுங்கள் !

ஈ. ராஜன், வனவர்,
பாப்பம்பட்டி ஸ்ரீவு
கொழுமல் வனச்சிகழம்,
திருப்பூர் வனக்கோட்டம்,
ஐதானமலை புலிகள் காப்பகம்.

FIELD OBSERVATIONS

PILOT STUDY IN GRASS HILLS NATIONAL PARK FOR POPULATION ENUMERATION OF NILGIRI TAHR

Dr. B. Subbaiyan, Senior Research Fellow

Nilgiri Tahr is the only mountain ungulate in South India among the 12 species occurring in India. The pristine habitats of Nilgiri Tahr includes montane Grasslands and cliffs at elevations of 300m - 2600m MSL, at Anamalai Tiger Reserve (ATR), Mudumalai Tiger Reserve (MTR), Srivilliputhur-Megamalai Tiger Reserve (SMTR), Kalakkad- Mundanthurai Tiger Reserve (KMTR) and high Ranges of Palani and Siruvani hills. Nilgiri Tahrs are the guardians of the mountain ecosystem, which forms the birth place of many perennial and seasonal rivers. Nilgiri Tahrs, being endemic and endangered mammals, a synchronized survey was planned to enumerate the existing population in the Western Ghats.

As a prelude to the synchronized survey, a pilot study was planned to determine the methodology and to standardize the protocols for population estimation of Nilgiri Tahr. The following four methods were evaluated during the pilot study:

- 1. Total sampling method,**
- 2. Double-observer method**
- 3. Bounded count method**
- 4. Drone survey**

The study area for the pilot survey was planned at Grass Hills National Park, which is one of the large undulating landscape holding the metapopulation of Nilgiri Tahr. Grass Hills National Park is spread across 3123 Ha, at Anamalai Tiger Reserve, a UNESCO “World Heritage Site” and this pristine landform comprises montane shola grassland mosaic and high altitude peaks ranging from 2000 m MSL. This landscape harbors a vast array of incredible biodiversity of endangered and endemic flora and fauna. The Survey area of

Grass Hills National Park was divided into six feasible blocks based on the topographic map of the area and inputs from the frontline staff. The six survey blocks include Siluvamedu, Nandar of Akkamalai beat, Tanakkamalai, Usimalai, Kallarmalai and Podhumalai of Grass Hills beat. For each block, separate teams were involved and each team constituted Frontline Field staffs and researchers. The foot survey covered 49.8 Km of transect across Grass Hills National Park covering 6 grassland blocks. The field study was conducted for three consecutive days.

Total sampling method: It is based on direct sighting of the NilgiriTahr and counting the total number of individuals. In the total sampling method, 220 numbers were enumerated and the probability of sighting depends on the time and weather conditions. Although this method implicates, the total number and age sex classification of species in a particular area, it does not involve any scientific approach, hence it is statistically insignificant.

Double-observer method: This technique is based on the principle of Capture- Mark – Recapture framework. Double observer method, entails estimating the Nilgiri Tahr population through two different teams surveying in each block. Time intervals between both teams were uniformly fixed as 15 minutes in all the survey blocks, to apply the capture-recapture technique. Data analysis was performed using R software version 4.3.3. The estimated number of

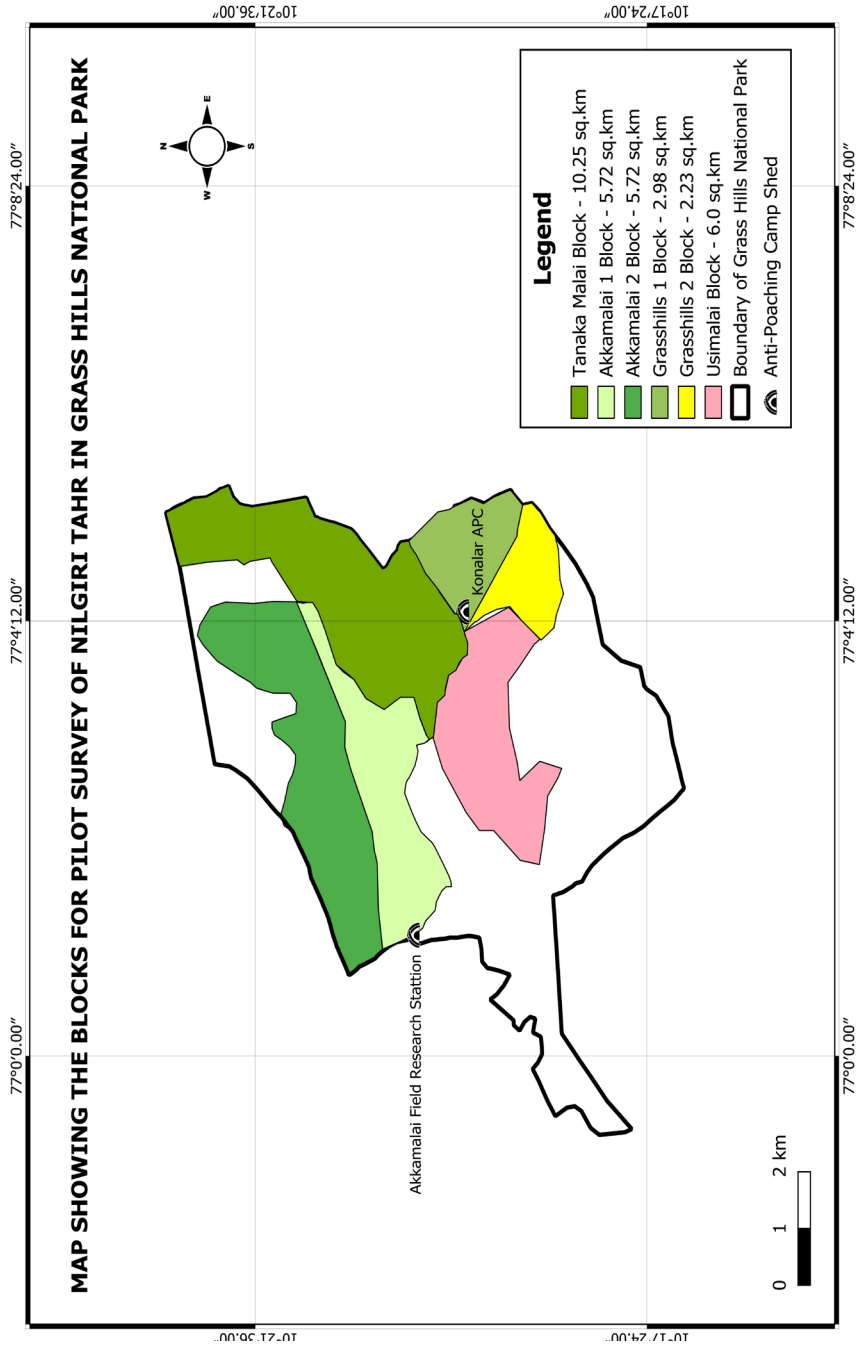


Nilgiri Tahr individuals in Double observer method is 323 with a mean group size of 29 and mean of the boot-strapped group size distribution was 11. Similarly, the male-female ratio of Nilgiri Tahr was estimated to be 1:1.15.

Bounded count method: In this method, the population enumeration of Nilgiri Tahr, in each area is carried out for three consecutive days, with special emphasis on vantage points for greater visibility. This method is widely used in Eravikulam National Park for the past two decades. The obtained data were enumerated using standard protocols with 20% standard error. Nilgiri Tahr population data of three days was implicated as follows: Day 1 – 220 individuals, Day 2 – 285 individuals and Day 3 – 94 individuals. The highest population count was recorded on the second day with 285 Nilgiri Tahr individuals. Similarly, the second highest was recorded on Day 1 which is 220. Hence the difference between these two observations yielded a value of 65 ($285-220=65$), which is then added to the highest count ($285+65=350$), which gives the actual result of 350. This method applies a standard error value of 20%. Hence, the overall estimation of the population is 350, whereas the lower limit is 285 and upper limit of the population is 545.

Drone survey: As the habitats of Nilgiri Tahr is mostly undulating and rugged terrains, they are unapproached by humans. Hence, it was planned to use a fore-fronted technology involving unmanned aerial vehicles (drones) to estimate the Nilgiri Tahr population. A total of 27 selected Nilgiri Tahr footages were obtained from the entire survey covering 2 blocks, based on which the population enumeration of Nilgiri Tahr was carried out. The number of estimated individuals using the Drone survey was found to be 187 numbers. These low numbers were attributed to the fact that only two blocks were surveyed among four due to bad weather. If all the six blocks were surveyed there could be a possibility of an increase in counts.

Conclusion: This pilot survey exercise provides insight on different approaches in determining the suitable methodology for population estimation of Nilgiri Tahr. These comprehensive findings indicate that the statistically valid and significant double observer method is suitable for enumeration of Nilgiri Tahr population in contiguous landscape in two well protected areas holding metapopulation like Grass Hills National Park and Mukurthi National Park. The pocketed population of Nilgiri Tahr in fragmented habitats could be enumerated using bounded count method.



BRONZE-HEADED VINE SNAKE

(*Ahaetulla perroteti*) Duméril, Bibron & Duméril, 1854 recorded in the Nilgiri Tahr habitat of Mukurthi National Park

Manigandan K, Senior Research Fellow

During the field survey at the Western catchment region of Mukurthi National Park, for continuous monitoring and tracking of the suitable Nilgiri Tahr for Radio collaring activity, the research team documented the floral and faunal diversity of the habitat. The habitat is endowed with open montane grassland along with perennial water streams and small trees like *Rhododendron nilagiricum*. This region has four different herds of Nilgiri Tahr with group size varying between 8 and 42 individuals. During the field observation, the repeated occurrence of Bronze-headed vine snake (*Ahaetulla perroteti*), one male and a female, was documented at Devils Gap, Watch Tower (2420 m MSL). The higher-altitude pristine grassland ecosystem has many endemic and endangered species and one of them is *Ahaetulla perroteti*.

The Bronze-Headed Vine Snake (*Ahaetulla perroteti*), commonly known as the Perrotet's vine snake or the Western Ghats bronzeback, belongs to the Colubridae family. It is also regionally known as Pachai paampu and Cholapacholan paampu in Malayalam. The genus name '*Ahaetulla*' was taken from the Sri Lankan Sinhalese word "ahata gulla," meaning "eye picker." The species name, '*perroteti*', is in honor of French naturalist George Samuel Perrottet (1793–1867).

These snakes are endemic to the states of Tamil Nadu and Kerala at high-elevation regions above 1,600 meters (5,200 feet). Of all the Indian *Ahaetulla* species, the geographical range of *A. perroteti* may be

the shortest. It is protected under Schedule II Part C of the Wildlife Protection Act. This species is found in the high-altitude regions of Nilgiri hills, namely Siruvani Peak, Vellarimala or Camels Hump, Mukurthi National Park and Silent Valley National Park.

It is a small vine snake with relatively thicker robust body and a shorter tail. The dorsal body color shows distinct sexual dimorphism in which males are green or yellowish-green in color whereas the females are brownish-orange or brownish-ochre. It has smooth dorsal scales, a long head, a pointed snout, a light-colored upper lip, a large, transversally oval eyes with horizontal pupils and subcaudals on the ventral side.

The predation of an bush frog by a male *Ahaetulla perroteti*, was also documented at No.3 dam of Western Catchment. This camouflaged poikilotherm was seen slithering in the grass floor after its heavy meal. These terrestrial vine snakes may play a key role in stabilizing the prey base in this pristine grassland ecosystem. This species is very unique in the Nilgiri Tahr habitats, especially in high-altitude montane grassland.



Ahaetulla perroteti - Green (Male)



Ahaetulla perroteti - Brown (Female)



George Samuel Perrottet

FLORA CORNER

Ceropegia pusilla Wight and Arn.- A traditional endangered and endemic species recorded in Nilgiri Tahr habitat of Nilgiris landscape

Dr. B. Subbaiyan, Senior Research Fellow



Genus *Ceropegia* belongs to the family Apocynaceae. *Ceropegia pusilla* is an endangered and endemic flora of the Southern Western Ghats. It is commonly known as Weak *Ceropegia*. The structure of the flower of *C. pusilla* looks like a milk-churning stick used by Toda tribes in the Nilgiris. This structure of this unique milk churning sticks was made using the cane and is still proudly used by Toda tribal people of the Nilgiris district. Lobes of the flowers of these species are famous for their miniature churning stick-like appearance. The tubers of *C. pusilla*, rich in carbohydrates with high nutritious value, are being collected during the monsoon season and are consumed by the Toda tribes as a traditional practice. The species is predominantly found in the Nilgiri

Tahr habitat. Feeding of these flowers by Nilgiri Tahr, although not recorded, may be foraged due to the presence of oily latex instead of milky latex. Further, the present study also pointed out that the blooming time of *C. pusilla* could indicate the onset of early monsoon every year in the Nilgiri district. Being a biological indicator, deep research of *C. pusilla* provide insights on meteorological signs. The closely associated species of *C. pusilla* are *Chrysopogon zeylanicus*, *Eulalia phaeothrix*, *Impatiens nilagirica*, *Impatiens chinensis*, *Sonerila versicolor*, *Satyrium nepalense* and *Habenaria longicornu*.

SPECIAL COLUMN

RADIO COLLARING OF NILGIRI TAHR AT WESTERN CATCHMENT, MUKURTHI NATIONAL PARK

Mr.S.Gokul prasath. Senior Research Fellow

Radio collaring is a method of tracking and studying the behaviour of wild animals by attaching a collar fitted with a radio transmitter and battery to the animal. The collar emits satellite signals which helps the researchers to track the animals home range, behavior, migration, and population dynamics. As a first-of-its-kind event, a Nilgiri Tahr was successfully Radiocollared at Mukurthi National Park. This initiative was a joint effort of WWF-India and Project Nilgiri Tahr. The Radio Collaring activity was an outcome of meticulous team work, which was planned after conducting expert opinion meetings.

Nilgiri Tahrs, native to Western Ghats of India, are the treasure trove of biodiversity. Radio collaring of any mountain ungulate is a tedious task for researchers across the globe. After receiving prior permission from Government of India to capture and collar Nilgiri Tahr to study the habitat usage and its behavioural dynamics, Radio collaring of Nilgiri Tahr was systematically planned and executed in the field.

Mukurthi National Park, is a 78.46 km² protected area located in the West of the Nilgiris Plateau, characterized by montane grasslands and shrublands and the high altitude peak varies from 1500 m MSL to 2400 m MSL. In Tamil Nadu, Mukurthi National Park holds the large population of Nilgiri Tahr, next to Grass Hills National Park. The Nilgiri Tahr herds at Western Catchment beat in the Mukurthi Range was continuously monitored for a long term by field personnel and a healthy saddle back male individual was selected among the

31-member herd, and it was lured by keeping salt licks at specific sites, in the grazing grounds.

To capture the Saddleback male Nilgiri Tahr, without chemical tranquilization, a team of experts and field staffs, carefully captured the animal using drop net method. To avoid capture myopathy, the animal was blindfolded with a cotton cloth and the movement was restricted by tying a soft cotton cloth. Captured individual was provided with natural salt water by oral route to ensure nutrient supply and vital signs were monitored using pulse oximeter and morphometrics were recorded. After measuring the neck girth (55 cm) of the captured animal, the Radio Collar harness was adjusted and ensured fit to the individual's requirement.

The installed Radio collar (Vectronic Vertex plus- VHF) with drop-off transmitter, weighing 750 g was imported from Vectronics Aerospace (Germany) (Iridium satellite technology) and the tracking receiver module (TR8 VHF receiver along with RA23K antenna) was imported from Telonics in the United States. The Radio collar transmits signals which include GPS coordinates of animal presence and the receiver module gains data within maximum proximity tracking distance. The pellet samples were collected before and after capturing the animal. The whole process was completed and the animal was released back into the



A saddle back male Nilgiri Tahr Radiocollared at Mukurthi National Park



wild within 20 minutes. Post-release, the individual was spotted with binoculars and the behavior was noted.

This Radio Collar provides the movement data of Nilgiri Tahr, once in three hours, which helps to determine its home range, physical activity like

fodder preferences, exploratory and breeding behaviour. Thus, radio telemetry studies are an important tool for wildlife researchers, to intensify scientific data of the species.

CLINICAL DIAGNOSIS OF LUMP/ SWELLING IN NILGIRI TAHR AT WESTERN CATCHMENT, MUKURTHI NATIONAL PARK

Manigandan K, Senior Research Fellow

Project Nilgiri Tahr represents the government's commitment to preserve the endemic, endangered, and flagship species –'the Nilgiri Tahr'. 'Diagnosis and treatment of affected individuals' being one of the main components of Project Nilgiri Tahr, the major disease or physiological abnormalities in Nilgiri Tahr are continuously monitored by the team members in coordination with frontline field staffs. Nilgiri Tahr encounters multiple threats from natural causes and anthropogenic pressure exerted on their habitats. In some Nilgiri Tahr individuals, an abnormal swelling/ lump or 'tumor-like masses' of various sizes are present in different body parts. In 2019, WWF- India, reported 25 Nilgiri Tahrs were affected with physical deformities like abnormal lump/ swelling in various landscapes, from Nilgiris to Kanyakumari in Tamil Nadu.

The clinical diagnosis of the lump in Nilgiri Tahr at Western catchment was carried out by Project Nilgiri Tahr under the guidance of Dr. C. Sreekumar, Professor & Head, Department of Wildlife Sciences, Madras Veterinary College, in coordination with the Forest Veterinary Team of the Tamil Nadu Forest Department, a team of Veterinary Doctors from Tamil Nadu Animal Science University (TANUVAS), Chennai, and the World Wide Fund for Nature.

Totally five lump-affected Nilgiri Tahr individuals were identified during the first synchronized Nilgiri Tahr population estimation survey at the following areas: 3 individuals at the Western catchment of Mukurthi National Park - an adult female, a young one, and a yearling; 9th Hairpin Bend (Villoni) of Pollachi Division - a

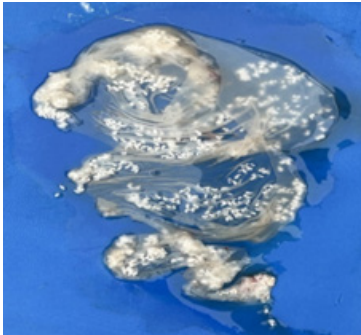
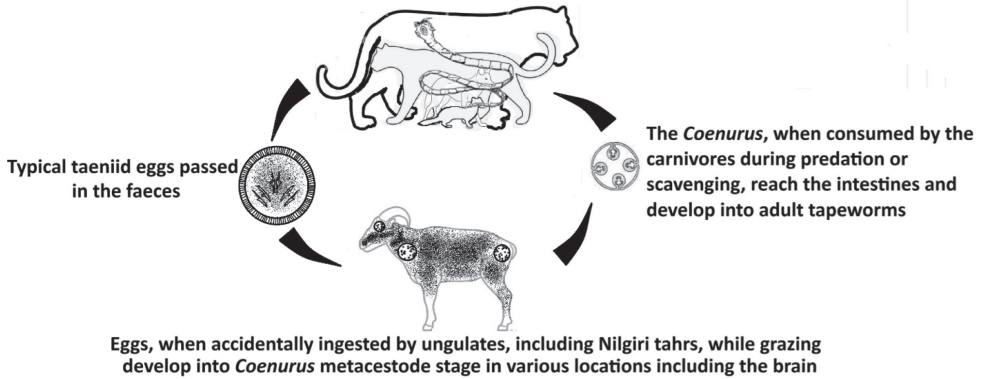


adult male; Sembaralimottai of Virayan Kovil Beat in Srivilliputhur — a Saddleback male.

Three lump-affected Nilgiri Tahrs, an young, an adult female and a yearling was recorded in a herd among the 31 individuals at Western catchment. On April 29, 2024, an adult female with a medium sized lump on right shoulder, was captured using net. The captured animal was blind folded and tranquilized.

All vital signs were recorded, and necessary samples like blood, nasal swabs, anal swabs, ocular swabs, hairs, lump fluid and tissue samples were collected in appropriate sterile containers. The necessary blood-smeard slide has been prepared on the spot. Then the lump was surgically removed and the site was properly treated with antibiotics and anti-inflammatory medicines and sutured. The entire procedure was carried out following standard operating protocols. The lump was a fluid filled cyst and contained about 300 ml of fluid with protoscoleces. The treated individual was released back safely into the wild within the planned period and observed for about 15 days. Feeding and nursing behaviour, urination and defecation were also found to

Adult *Taenia* tapeworms in the intestines of wild carnivores including tigers, leopards, dholes, jackals, martens, etc.



Coenurus cyst with thin transparent membrane containing numerous protoscoleces.



Scolex of Tapeworm

be normal. The collected samples were sent to TANUVAS, IVRI and AIWC for laboratory analysis.

Conclusion

Based on laboratory diagnosis, it was found that the lumps found in the Nilgiri tahrs are caused by *Coenurus* cysts, which are the intermediate stages of carnivore tapeworms (*Taenia multiceps*). The adult tapeworms are present in the intestines of wild carnivores (dhole etc) which are the definite hosts. The eggs of tape worms passed in the feces of these carnivores are accidentally ingested by the herbivorous especially Nilgiri Tahr, which serves as the intermediate hosts, in which they complete their larval (metacestode) stage. The definite hosts gets infected during predation of the infected animal. It is also inferred that, the lumps are not fatal to Nilgiri Tahr by itself, unless the tape worms invade the brain and it is a part of the normal sylvatic prey-predator life-cycle of tapeworms. This exercise is more remarkable as the Nilgiri Tahr was captured, tranquilised and physically examined for the first time. It was a great relief to know that these lumps were not lethal, as the Government have plans to reintroduce Nilgiri Tahr in some of the erstwhile habitats, where they had gone locally extinct.

APR - JUNE 2024

Pasumalai - A newly colonized habitat of Nilgiri Tahr

Dr. S. Priyanka, Senior Scientist cum Research Coordinator

Pasumalai, a newly colonized habitat of Nilgiri Tahr, is located in the Erasai West beat of Chinnamanoor Range in Megamalai Forest Division. Five Nilgiri Tahr individuals were spotted in Pasumalai by frontline field staffs during November 2023. The new colonization embarks the exploratory behavior of Nilgiri Tahr. During the synchronized survey, old pellets of Nilgiri Tahr were also documented in this area. The elevation of the Pasumalai habitat ranges about 1392 m MSL and it is surrounded by shola forest and abandoned coffee estates on either side. The area has potential grassland cover atop the hillocks and cliffs with few escape terrains. Faunal diversity is rich in Pasumalai habitat including carnivores like bear, tiger, leopard, and herbivores like Gaur, elephant, sambar

deer etc. Recently, interesting species like pangolin and porcupine, were also documented in this area.

This area has perennial water source and abundant floral diversity. It was noted that one adult male Nilgiri Tahr uses this habitat as a corridor. The herds move from Narayandevan patty Varaiyattumottai of Highwavys mountains to Pasumalai. Livestock grazing by nearby villagers was documented as a major threat in this area. If the anthropogenic pressures are alleviated, then Pasumalai of Megamalai Forest Division, with its adorned floral and faunal diversity, could be a potential Nilgiri Tahr habitat.



EDITOR'S CHOICE

First Synchronized survey of the State animal- the Nilgiri Tahr

Dr. S. Priyanka, Senior Scientist cum Research Coordinator



The Nilgiri Tahr, is an iconic and endangered species of the Western Ghats, is renowned for its remarkable ability to navigate sheer cliffs and challenging terrain. This species has historical and cultural significance, with special mentions in ancient Tamil literature. This iconic species symbolizes more ecological significance by protecting the montane grassland ecosystem, thus aid in carbon sequestration and nutrient recycling in the water catchment areas. The grasslands, which are the pristine Nilgiri Tahr habitats, acts as a carbon sink to alleviate greenhouse gas emissions. Biennial synchronized survey, being an important objective of Project Nilgiri Tahr, it was planned to enumerate the population of the endemic mountain ungulate Nilgiri Tahr, across the Western Ghats.

The first-ever synchronized survey to estimate the population of Nilgiri Tahr

was conducted by Project Nilgiri Tahr as a coordinated effort of Tamil Nadu Forest Department and Kerala Forest Department. The survey covered extensively all the Tahr habitats across the Western Ghats from Nilgiris in the North to Kanyakumari in the South along with the adjoining habitats Eravikulam National Park and Silent Valley National Park, Kerala. During the survey, experts like Dr. Yash Veer Bhatnagar, Country representative, International Union for Conservation of Nature (IUCN)- India, New Delhi and Dr. S. Sathyakumar, Registrar and Scientist 'G', Wildlife Institute of India, Dehradun was invited.

The population estimation of any mountain ungulates is a tremendous task, owing to the rugged terrains, and inhospitable habitats. The survey was

planned as a three-day protocol involving experts, veterinary doctors, scientist, researchers, field biologists and trained field staffs, to follow scientific approach. This exercise is a hybrid mode with two statistically robust methodologies, Double observer and Bounded count, were adopted based on the results obtained from Pilot study conducted at Grass Hills National Park. Bounded count methodology was tremendously followed in Kerala for Nilgiri Tahr population estimation. The Nilgiri Tahr habitats were covered on foot surveys and drones were used for documentation of the survey.

The survey was carried out in 13 Forest Divisions and 36 Forest Ranges holding 140 survey blocks with special emphasis on habitats located in the inter-state boundaries. The 13 Forest Divisions include Mukurthi, Nilgiris, Gudalur, Coimbatore, Pollachi, Udumelpet, Srivilliputhur, Theni, Megamalai, Tirunelveli, Kalakkad, Ambasamudram and Kanyakumari. The large population in the two well-protected areas including the three adjoining habitats of Kerala (vembanthani, poovar and sispara) was reckoned using double observer method, whereas the pocketed population was enumerated using bounded count methodology. The experts and research personnel from WWF-India and WII were also involved in this exercise. A separate team involving experienced field staffs and six veterinary doctors from TANUVAS, Chennai were also formed to monitor the lump affected Nilgiri Tahr.

For the synchronized survey, totally 11 capacity building and training programs were conducted to Field staffs across all Tahr holding Divisions. The survey was conducted for three days from 29th April 2024 to 01st May 2024. Apart from population count, age-sex

classification and threats associated with Nilgiri Tahr were also documented. Fresh pellets were also collected during the survey and the collected pellet samples were sent to AIWC, Vandalur, for population genetics study and creation of DNA repository

Conclusion

In Tamil Nadu, the field exercise covered a foot survey of 1862 Km in various landscapes by 708 members. The synchronized survey results not only enumerated the population of Nilgiri Tahr but also aided in estimating the range, herd size, mean number of groups, age- sex classification, lump-affected individuals, common fodder species, terrain type, newly colonized places, historic habitats, elevation range and anthropogenic pressures in each habitats etc. This report serves as a primary data for planning conservation practices and mitigation of management plans to safeguard the State Icon- the Nilgiri Tahr. The results of synchronized survey helps to understand the ecological status of the animal and the mitigation of management practices, highlighting the importance of extenuating protection measures. The periodic survey of Nilgiri Tahr also helps in understanding of population trend, neonatal rate, survival rate, predator-prey ratio and also to delineate the anthropogenic pressures exerted on Nilgiri Tahr. The population of Nilgiri Tahr will follow an uptrend, only with the strong management practices and implementation of systematic conservation plans.

PHOTO GALLERY



Joseph vidhya Kshetra Senior Secondary School (CBSE), Chennai.

Students Takes Pledge to Conserve the State Animal on Wold Wildlife Day (March 3rd, 2024) about 15600 sudents and public were taken Pledges for Conservation of Nilgiri Tahr.



Education materials were distributed to District Education Officer, Coimbatore



Themeda triandra



Satyrium nepalense



Habenaria rariflora

GOVERNMENT OF TAMIL NADU FOREST DEPARTMENT
POSTAL STAMPS OF UNGULATE'S
ACROSS THE WORLD



JUNE 5th WORLD ENVIRONMENTAL DAY
PROJECT NILGIRI TAHR

POSTER VLOG



PROJECT NILGIRI TAHR



Themeda tremula



Tripogon pungens



Eulalia phaeothrix



Cenchrus ciliaris



Arundinella purpurea



Chrysopogon zeylanicus



Cyanotis tuberosa



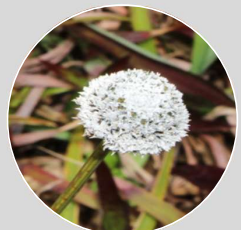
Fimbristylis aggregata



Cyanotis arachnoidea



Commelina benghalensis



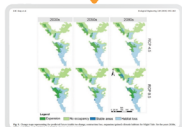
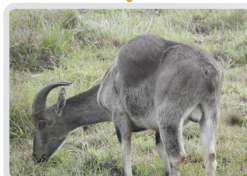
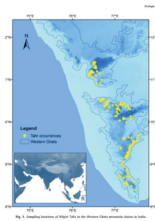
Eriocaulon brownianum



**GRASS DIVERSITY
IN TAHR HABITAT**



THREATS OF NILGIRI TAHR IN THE SOUTHERN WESTERN GHATS



**HABITAT
FRAGMENTATION**

**MONOCULTURE
PLANTATION**
**INVASIVE
SPECIES**

**FOREST
FIRE**

**LINEAR
INFRASTRUCTURE**

ENCROACHMENT

**LIVESTOCK
GRAZING**

**POACHING
(IN PAST)**

PREDATION

DISEASE

**CLIMATE
CHANGE**

**PROJECT NILGIRI TAHR,
TAMILNADU FOREST DEPARTMENT**

FACTS ABOUT NILGIRI TAHR

Nilgiri Tahr- are the only sub-species of the genus Nilgiritragus.

Nilgiri Tahrs are introverts.

Nilgiri Tahrs are polygynous.

These even-toed ungulates exhibit significant sexual dimorphism.

Both sexes have unbranched horns slightly curved backwards.

The horns of Nilgiri Tahrs contain annular growth rings.

All-male groups (Bachelor herds) constitute about 8-25 individuals.

The adult male develops silvery grey hair on their backs, hence called 'Saddle- backs'.

The saddle-back males exhibit a dominance hierarchy.

Female Nilgiri Tahrs have two teats.

Male Tahrs undergo 'Mating Battles'.







A Publication by
Project Nilgiri Tahr



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