

VOL. 12 ISSUE 2 · NOV 2022

# AQUATIC BIODIVERSITY AND MARINE POLLUTION

LIFE E-NEWSLETTER



## EDITOR'S NOTE -

Mokshada Mali

It gives me an immense joy to announce volume 12 issue 2 of SIES Life . As always, this wouldn't have been possible without the support of all our readers. This issue comprises some articles related to theme and some offbeat. Importantly, we are excited to share the article regarding 2022 Nobel prize winner Swante Paabo's contribution to studies in human evolution.

Beside with that there are fascinating photographs captured by our students .

Last but not least , I would extend my whole -hearted gratitude to my entire Team, who have constantly showed their support.  
Happy Reading !



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# DISCOVERIES CONCERNING THE GENOMES OF EXTINT HOMININS AND HUMAN EVOLUTION

THE NOBEL ASSEMBLY AT **KAROLINSKA INSTITUTE** AWARDED THE 2022 NOBEL PRIZE IN PHYSIOLOGY OR MEDICINE TO **SVANTE PAABO** FOR HIS DISCOVERIES CONCERNING THE GENOMES OF EXTINCT HOMININS AND HUMAN EVOLUTION.

**SVANTE PAABO** WAS BORN 1955 IN STOCKHOLM, SWEDEN. HE DEFENDED HIS PHD THESIS IN 1986 AT **UPPSALA UNIVERSITY** AND WAS A POSTDOCTORAL FELLOW AT UNIVERSITY OF ZURICH, SWITZERLAND AND LATER AT **UNIVERSITY OF CALIFORNIA, BERKELEY, USA**. HE BECAME PROFESSOR AT **THE UNIVERSITY OF MUNICH** IN 1990. IN 1999 HE FOUNDED **THE MAX PLANCK INSTITUTE FOR EVOLUTIONARY ANTHROPOLOGY** IN LEIPZIG WHERE HE IS STILL ACTIVE. HE ALSO HOLDS A POSITION AS ADJUNCT PROFESSOR AT **OKINAWA INSTITUTE OF SCIENCE AND TECHNOLOGY, JAPAN**.

THROUGH HIS PIONEERING RESEARCH, SVANTE PAABO ACCOMPLISHED SOMETHING SEEMINGLY **IMPOSSIBLE**: SEQUENCING THE GENOME OF THE **NEANDERTHAL**, AN EXTINCT RELATIVE OF PRESENT-DAY HUMANS. SVANTE PAABO PUBLISHED THE FIRST **NEANDERTHAL GENOME SEQUENCE** IN 2010. COMPARATIVE ANALYSES DEMONSTRATED THAT THE MOST RECENT COMMON ANCESTOR OF NEANDERTHALS AND HOMO SAPIENS LIVED AROUND **800,000 YEARS** AGO. IN 2008, A 40,000-YEAR-OLD FRAGMENT FROM A **FINGER BONE** WAS DISCOVERED IN **THE DENISOVA CAVE** IN THE SOUTHERN PART OF SIBERIA. THE BONE CONTAINED EXCEPTIONALLY WELL-PRESERVED DNA, WHICH PAABO'S TEAM SEQUENCED. THE RESULTS CAUSED A SENSATION: THE DNA SEQUENCE WAS UNIQUE WHEN COMPARED TO ALL KNOWN SEQUENCES FROM NEANDERTHALS AND PRESENT-DAY HUMANS.

PAABO HAD DISCOVERED A PREVIOUSLY UNKNOWN HOMININ, WHICH WAS GIVEN THE NAME DENISOVA. WITH THE HELP OF SVANTE PAABO'S DISCOVERIES, WE NOW UNDERSTAND THAT ARCHAIC GENE SEQUENCES FROM OUR EXTINCT RELATIVES INFLUENCE THE PHYSIOLOGY OF PRESENT-DAY HUMANS. ONE SUCH EXAMPLE IS THE DENISOVAN VERSION OF THE GENE EPAS1, WHICH CONFERS AN ADVANTAGE FOR SURVIVAL AT HIGH ALTITUDE AND IS COMMON AMONG PRESENT-DAY TIBETANS.



PAABO'S SEMINAL RESEARCH GAVE RISE TO AN ENTIRELY NEW SCIENTIFIC DISCIPLINE; PALEOGENOMICS. BY REVEALING GENETIC DIFFERENCES THAT DISTINGUISH ALL LIVING HUMANS FROM EXTINCT HOMININS, HIS DISCOVERIES PROVIDE THE BASIS FOR EXPLORING WHAT MAKES US UNIQUELY HUMAN.

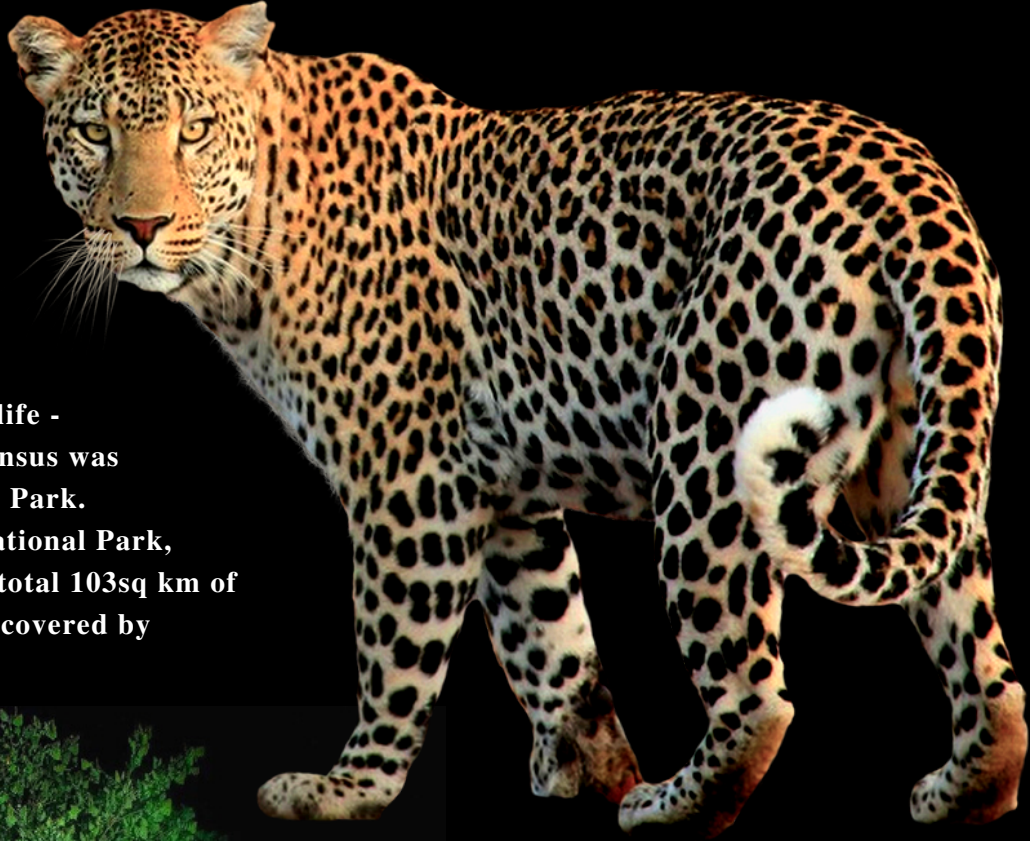
## ORIGINAL PUBLICATION

<https://www.nobelprize.org/prizes/medicine/2022/press-release/>

# NOCTURNAL CENSUS

BY VEDANT KHOKRALE  
SYBSC-A

Census gives an idea of the population of particular species at particular habitat at a particular time. It is one of the major parts of wildlife conservation and, thus it may be said census is the key of Wildlife - management-techniques. One such census was conducted in Sanjay Gandhi National Park. Established in 1969 as Krishnagiri National Park, SGNP is spread across Mumbai with total 103sq km of area. About 20% of the metropolis is covered by Sanjay Gandhi National Park.



It is also a part of the western ghats, blessed with diversity of the forest and geographic location we find many species of flora and fauna in the park. In present time there are 1300+ species of flora and 40 different species of mammals with 220+ species of birds. Mixed deciduous type of forest is majorly the dominated type of forest in the park which is one of the reasons why we find so much diversity in the park. Each year on Buddha Poornima 16th May which is the brightest moon in the year, a Nocturnal census is conducted by Sanjay Gandhi National Park to survey the night life of the park. I find myself fortunate enough to be selected by NIC (Nature Interpretation Centre) as a volunteer for the census. A total 61 volunteers on different machans in the forest were allotted one forest guard. We had to assemble at 2pm near the Borivali gate where a small session was conducted by the Chief Education Officer Mr Samarth Parab.

Later even the Range Forest Officer , Santosh Kanak (dada) gave a small speech related to wildlife and what not to do during the census this was followed by a short speech delivered by ACF Sir Mr Sanjay Kamble (dada) and The Director of the Sanjay Gandhi National Park CF Mr Mallikarjun (dada) concluded the session with his very powerful and enlightening speech related to the conservation of the natural world. A survey sheet was given to us to write down our observations and sightings. We were taken to the bus with our forest guard Abhimanyu Jadhav (dada) near the Gundgaon forest. After reaching our machan by 5 pm in the evening Abhimanyu Dada took me for a round within the core area to understand the surrounding of my forest area much better. Once it was 6:30 we returned back to the machan and now the most important wait game starts the first sighting up close which I had was the Largest Deer of the Indian Subcontinent – female ‘Sambhar Deer’ at around 6:50 pm once it was pitch dark and the moon was up, we had pretty good light being Buddha Poornima.



The nocturnal life got active in and around the forest, soon we had good sightings of wild boars, Chital deer also called as Spotted deer, Indian Grey Mongoose and also Ruddy Mongoose. we also had amazing sightings and calls of nocturnal birds had 5 Bird lifers that day after having dinner while sitting on the machan took a small nap and around 3:00 am I had strong smell and instinct of a leopard around but couldn't spot one at 3:30 am I heard someone walking from leaf litter, it was a male sambhar deer.

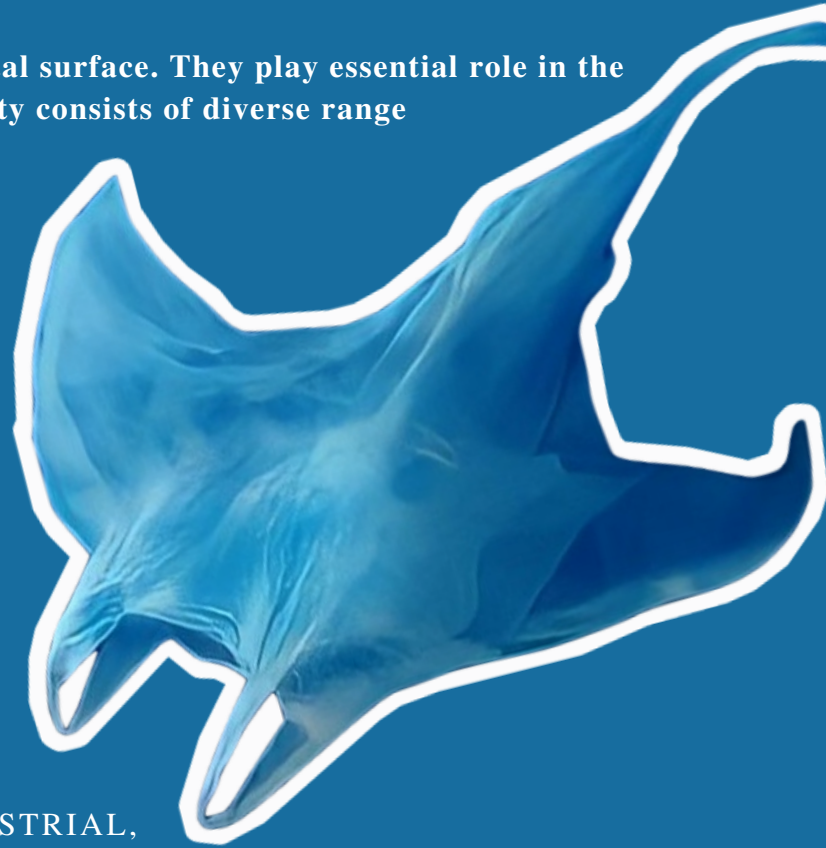
Just after few minutes strong smell started again, this time the smell got intense and to my surprise I saw a Female Adult Leopard pass just by my machan, she went to the water hole to hydrate herself. I still remember the sound splash which her tongue created while drinking water I had tears in my eyes by watching this magnificent predator in wild clearly. After spending few time there and realising that someone was watching her, she left again to follow the sambhar male which I had seen earlier. We waited for a while once it was 5 in the morning bird activity increased and the at around 6 am we got down from the machan and walked back from the forest to NIC while walking around we also had a very close encounter with the wild boars thanks to Abhimanyu dada who handled the situation very tactfully we were safe. We reached NIC and submitted the survey sheet. And this is how the nocturnal census was concluded at SGNP.

This experience to stay in the core forest at night was one of the life changing experiences I have ever had. We were taking back nothing but the forest in our hearts and only love and enthusiasm for the protection of wildlife.

# MARINE POLLUTION

BY DURGA ADELKAR SYBIOTECH

Oceans have acquired about 70% of earth total surface. They play essential role in the maintenance of ecosystem. Marine biodiversity consists of diverse range of species. Marine pollution is the introduction of toxic substances or pollutants in the sea, and which impact on the marine diversity adversely. This pollution has severely damaged the habitat of marine mammals, corals and fishes by causing mass death, problems to their reproductive system. Due to the marine pollution there is formation of low oxygen zone in the oceans water promotion excess of N<sub>2</sub> formation which is harmful for marine life.



## WHY?

- RELEASE OF POLLUTANTS FROM INDUSTRIAL, DOMESTIC AND AGRICULTURE WASTE.
- URBANIZATION AND INDUSTRIALIZATION NEAR COASTAL AREAS WHICH HARMFULLY IMPACT ON THE MARINE BIODIVERSITY. E.G INDUSTRIAL ACTIVITIES RELEASE POLLUTANTS THAT CAN LIMIT THE FAUNA AND FLORA'S ABILITY TO REPRODUCE AND GROW.
- CLIMATE CHANGE.
- OVERFISHING, TOURISM ETC. HAVE BEEN AFFECTED THE MARINE LIFE IN ORDER TO GAIN ECONOMICAL GROWTH.

**But when there is problem there is solutions, we can collectively reduce this marine pollution and make oceans safe and sound by practicing some precautionary measures.**

- AVOID SINGLE USE OF PLASTIC AND FORM POLICIES WHICH SUPPORT THE NON-LITTERING OF PLASTICS INTO THE OCEANS.
- Ban ON THE UNTREATED DISCHARGE OF SEWAGE INTO THE OCEANS.
- REDUCE INDUSTRIAL AND CHEMICAL POLLUTION.
- AVOID BOATING AND FISHING WHICH CAN BE HARMFUL FOR MARINE LIFE.
- GOVERNMENT SHOULD INCREASE THE FUNDING FOR PREVENTION OF MARINE LIFE AND ENCOURAGE AND AWARE CITIZENS ABOUT THE IMPORTANCE OF PREVENTING MARINE POLLUTION.
- STRENGTHEN THE LAWS REGARDING MARINE POLLUTION.

**BY TAKING ALL THESE MEASURES WE CAN BUILT BETTER ENVIRONMENT FOR MARINE LIFE AND MARINE BIODIVERSITY CAN BE SECURED.**

# SCABIES

By Somlata Nagar  
 SYBSC-A



**SCABIES** IS AN EPIZOOTIC DISEASE CAUSED BY THE MITE **SARCOPTES SCABIEI**. USUAL SYMPTOMS ARE SEVERE **ITCHINESS** AND **PIMPLE-LIKE RASHES** ON THE SKIN. SCABIES AFFECTS THE PEOPLE WORLDWIDE.

BEFOREHAND, **SARCOPTES SCABIEI** WAS PLACED IN THE GENUS **ACARUS** AND NAMED **ACARUS SCABIEI DEGEER, 1778**. BUT NOW IT IS PLACED IN THE SUPERFAMILY **SARCOPTOIDEA** AND FAMILY **SARCOPTIDEA**.

## MORPHOLOGY

**S. SCABIEI** HAS AN **OVAL TORTOISE-LIKE BODY**, DORSALLY CONVEX AND VENTRALLY FLAT. ALL LEGS OF MALE AND FEMALE ARE **MINUTE** AND **THICK**. MALES AND FEMALES HAVE **CLAWS** ON THEIR EXTREME SEGMENT OF LEGS. FEMALES HAVE TWO **SPUR-LIKE CLAWS** ON THE EXTREME SEGMENT OF 1ST, 2ND, 3RD AND 4TH LEGS BUT MALES HAVE TWO **SPUR-CLAWS** ON LEG 1, 2, AND 3 AND **ONLY ONE** ON THE 4TH LEG.

## LIFE CYCLE

DEVELOPMENT STAGES OF **S. SCABIEI** ARE **EGG, LARVAE, PROTONYMPH** AND **ADULT**. REPORTED TIME SPAN OF THE LIFE CYCLE FOR SCABIEI MITES IN HUMANS IN DIFFERENT STUDIES ARE **12 TO 17 DAYS, 17 TO 21 DAYS, 7 TO 10 DAYS, 9 TO 15 DAYS** AND ABOUT 15 DAYS. THE CAUSE FOR THIS IS STILL **UNKNOWN**. THE **FEMALE** MAKES AROUND **40-50 EGGS** OR MORE EGGS OVER A LIFESPAN. AFTER THE **30-53 HOURS** OF INCUBATION, THE **LARVAE** EMERGE FROM THE EGG.



# Diagnosis

THE CLINICAL DIAGNOSIS OF THE SCABIES IS USUALLY BASED ON A HISTORY OF **PRURITIC RASH** THAT BECOMES WORSE AT **NIGHT**. ALTHOUGH THE EXISTENCE OF BURROWS OFTEN HELPS TO ESTABLISH THE DIAGNOSIS. OTHER WAYS TO DIAGNOSE SCABIES INCLUDES:



A BURROW INK TEST



SKIN SCRAPING

# Treatment

**SCABICIDES** IS A PRODUCT TO TREAT SCABIES WHICH **KILL** THE MITES; SOME ALSO MIGHT KILL **MITE EGGS**. DOCTOR'S PRESCRIPTION IS NEEDED TO USE SCABICIDES TO TREAT HUMANS. THE INSTRUCTION SHOULD ALWAYS BE CAREFULLY FOLLOWED CONTAINED IN THE BOX OR PRINTED ON THE LABEL.

**SCABICIDE LOTION OR CREAM** SHOULD BE APPLIED ALL OVER THE BODY FROM NECK TO FEET AND TOES. FOR **NEW-BORNS** TREATMENT ONLY

**OINTMENT** MAY SCABIES ARE

**PERMETHRIN** OR **SULFUR** BE USED. THE SYMPTOMS OF

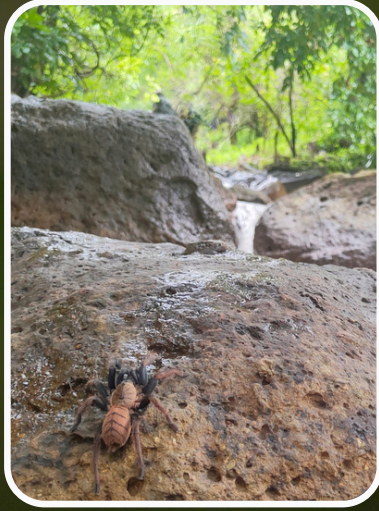
DUE TO A **HYPERSENSITIVITY REACTION** TO MITES AND THEIR FAECES, ITCHING STILL MAY CONTINUE FOR SOME **WEEKS** AFTER TREATMENT EVEN IF ALL THE MITES AND EGGS ARE KILLED.



# Conclusion

HUMAN SCABIES IS **CONTROLLABLE** TO TREATMENT. INCREASED **AWARENESS**, ACCURATE DIAGNOSIS, AND **PROMPT TREATMENT** ARE ESSENTIAL FOR EFFECTIVE CONTROL, REMAIN KEY PRIORITIES IN ACHIEVING THE NUMBER ONE PRIORITY FOR THE **IACS** (INTERNATIONAL ALLIANCE FOR THE CONTROL OF SCABIES): **TO ADVANCE THE ESTABLISHMENT OF GLOBAL CONTROL MEASURES FOR REDUCING THE IMPACT OF SCABIES ON HUMAN POPULATION.**

# PHOTO GALLERY



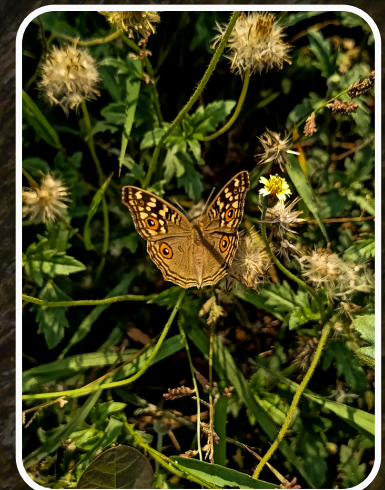
Indian Violet Tarantula  
Vedant Khokrale  
SYBSC-A



Common Hedge  
Blue  
Asher Abraham  
TYBSC -C



Painted Grasshopper  
Vinod Kulal  
TYBSC -C



Lemon Pansy  
Gaurav Patil  
TYBSC-C