



CSIR IN Media

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NBRI research will make gold facials cheaper

CSIR-NBRI

The expensive gold facial that you wanted but could not afford, will soon be within your budget. Scientists at the National Botanical Research Institute (NBRI) here have developed an eco-friendly way to create nano particles of gold in just one minute.

According to scientist Aradhana Misra, “Gold nano particles can be developed by chemical methods but we have found a non-chemical approach — a green way — to create nanotised gold using *Trichoderma viride* — a fungus. Quick synthesis of nano particles was possible by the use of the fungi.”

As many as 300 fungi were screened and experimented by the scientists for the creation of nano particles of gold. Different shapes and sizes of gold nano particles were synthesised by the biological method. *Trichoderma* resulted in the quick synthesis of gold.

Dr Misra heads the four-member team that conducted the study. The study was published recently in an international journal called *Scientific Reports*.

According to scientists, the quick synthesis of gold nano particles by using *Trichoderma viride* will not only be an eco-friendly but also a cost-effective method as it would reduce the quantity of gold required significantly. Nanotised gold is used in less amount giving the same effectiveness and quality.

The scientist explained how in any field, if any material is nanotised, it would be utilised in very little quantity as compared to the quantity otherwise. For example, if a cosmetic or medicine uses one kg of gold normally, it would only use one gram in nanotised form.

Nanotised gold is being used for various industrial purposes such as in medicine, cosmetics, and pharmaceuticals, she said. Gold dust has been used in medicines in Ayurveda over a period of time as Swarna bhasma. The cost of the medicines in which gold is used would now be significantly reduced with the use of nanotised gold.

<http://www.asianage.com/science-health/nbri-research-will-make-gold-facials-cheaper-449>

Amita Verma | 11 July , 2016

Gold facials to become cheaper, thanks to fungus

CSIR-NBRI

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<http://www.deccanchronicle.com/science/science/100716/gold-facials-to-become-cheaper-thanks-to-fungus.html>

Amita Verma | 11 July 2016

Screening for rare genetic disorders at a point-of-click

CSIR-IGIB

The disease caused by each mutation is checked with the data bank and compared with the population frequency.

Fast and accurate diagnosis of disease-causing mitochondrial genetic mutations is now possible thanks to automation of the entire process of data analysis and interpretation by a team of researchers at the Delhi-based CSIR Institute of Genomics and Integrative Biology.

The comprehensive pipeline developed by a team led by Dr. Sridhr Sivasubbu and Dr. Vinod Scaria of IGIB includes methodologies to sequence mitochondrial genome using next generation sequencing and a software to appropriately analyse and interpret the data at a point-of-click.

Mitochondria, the powerhouses of the cell, are unique in several ways. A cell can have multiple mitochondriae, with each mitochondriae differing from one another by a few variations. This phenomenon is known as heteroplasmy. Heteroplasmy can vary between cells of the same tissue, organ, individual or even between individuals of the same family.

Though heteroplasmic mutations implicated in mitochondrial diseases are seen even in healthy individuals, the reason why they do not manifest as disease is due to low frequency of heteroplasmy. A person does not manifest the disease when the heteroplasmy frequencies are low, usually less than 10 per cent.

“Nearly 20 per cent of normal individuals harbour heteroplasmic mutations reported to be implicated in mitochondrial diseases but the frequency is less than 10 per cent,” said Dr. Scaria.

The mutations could also be acquired during cell division. While all cells will carry the mutations associated with disease when it is inherited, cells in different tissues may have different mutations when it is acquired.

Also, compared with nuclear genome, the mitochondrial DNA has a 5-10 times greater rate of mutation than nuclear DNA. “So it is not surprising that mitochondrial disorders are one of the commonest rare genetic disorders, with an incidence of approximately 1 in every 5,000 births globally,” says Dr. Scaria.

Though many hospitals now have the Next Generation Sequencing, doctors do have the expertise to do the entire process of seeing where the mutations are and interpret if the mutations so seen cause disease or not. Also, the frequency of heteroplasmic mutations needs to be known. Many of the so called mutations are common in the population but at a lower heteroplasmic frequency. “If the frequency is more in the population then the mutation is probably not a disease causing one,” Dr. Scaria said.

“We have attempted to close this gap by automation of the entire process of data analysis and interpretation,” he said. First the mitochondrial genome is sequenced using next generation sequencing. To make interpretation possible, the raw data is overlaid on the mitochondria genome and the positions where the variations are present are noted and the frequency of the variation in the sample is also recorded.

The disease caused by each mutation is checked with the data bank and compared with the population frequency. Since IGIB has the data of all disease-causing mutations and the frequency of every single disease-causing mutation in the global population, comparing the frequency of the sample with the population can be carried out automatically.

“The commercial application of the knowledgebase would enable fast and accurate diagnosis of mitochondrial genetic mutations with implications in clinical diagnosis, prenatal testing and carrier screening,” he said.

This technology has been licensed to the Bengaluru-based Eurofins Clinical Genetics India Pvt Ltd. to enable fast and accurate diagnosis, screening at clinical turnaround times and research into mitochondrial diseases. The service is presently available in India as MitoSure.

The company has been testing samples since mid-April. “We have so far tested 25 families,” said Dr. Surendra Chikara, Executive Director of Eurofins. The cost per test ranges from Rs.15,000-20,000 and has a turnaround time of two weeks.

“We will soon be starting screening campaigns for families with known history of disease-causing mitochondrial genetic mutations. This will help the family to know the female members’ carrier status,” Dr. Chikara said. In this case, the identified mutation alone is screened and cost Rs.5,000 per person.

<http://www.thehindu.com/sci-tech/health/screening-for-rare-genetic-disorders-at-a-pointofclick/article8831110.ece>

R. PRASAD | July 10, 2016

New Indian Technology for Waterless Tanning can Save Rivers

CSIR-CLRI

With its breakthrough technology on waterless tanning for leather processing, the Central Leather Research Institute (CLRI) expects to save the rivers from the toxic chromium and sulphates effluents mixed in over 170 million litres of water every day.

The CLRI, part of the Council of Scientific and Industrial Research (CSIR), applied to patent the technology in 2014. It now has a “product” and a “process” for waterless and salt-less tanning, that would save water and the environment. “To treat one kilogram of animal skin and hide about 50 litres of water is used. It’s required to wash the salts used by the tanners at primary stage to preserve the leather, making the effluents hazardous. With the dry tanning technology this would stop,” B. Chandrasekaran, Director CSIR-CLRI, told IANS.

He said that CLRI offers “Dry Tanning” as a product and another “Waterless Chrome Tanning” as a process, that requires training the tannery workers for using salts for preserving the animal skins at primary processing level.

The CLRI technology uses a conventional drum-tanning method, in which instead of lime and water, a CSIR’s patented additives are mixed. That saves water and also helps reduce the solid waste produced by lime and other chemicals.

“The technology reduces the water effluents by 90 to 95 percent,” said Chandrasekaran.

The CLRI, which is now being approached by leather companies across the globe to procure the technology, has also prepared a detailed project report (DPR) for Kanpur, Uttar Pradesh, where the largest number of tanneries are located in India.

“We have been contacted by several domestic tanneries and a big MNC that had offered Rs2 crore for the this technology,” he said.

Kanpur has over 23 percent of the country’s tanneries and uses about 20 million litres of water every day. Most of this untreated effluent flows out through over 23 major open drains into the Ganga river and are the major cause of its pollution.

“A DPR for Common Effluent Treatment Plants (CETP) for Kanpur is being finalised. The main problem is that only a few tanneries in Kanpur treat the effluents,” he said.

There are also several unauthorised tanneries in Kanpur region and about 100 were closed two years back.

Those operating water treatment plants only give primary treatment to the used water. According to environment activists, there is no proper monitoring of such treatment plants. According to green activists, it is a similar case with the tanneries of Kolkata and Tamil Nadu.

<https://greenstitched.com/2016/07/10/1320/>

July 11, 2016

Insights about Immune response to Dengue virus infection can help fight the disease

CSIR-IIGB

With the onset of the monsoon season earlier this month in most parts of India, the number of reported Dengue fever cases has gone up significantly. While stagnant water and augmented mosquito populations are obvious causes for this prevalent increase, what also plays a major role is the population's lack of awareness about preventive and protective measures. In a country where official reports state that almost 20000 people are affected by this disease annually, this ignorance on the public's part comes at a hefty price.

Apart from the estimated US\$ 1.11 billion economic burden it is expected to cause, lack of understanding about this mosquito borne disease is also rendering the public health system unprepared and inadequately equipped to deal with the large number of patients that are checking in with this disease everyday.

This disease is viral in origin, with four different strains of the Dengue virus being responsible for causing infection through the bite of the mosquito *Aedes Aegypti*.

However lack of extensive data pertaining to the immune responses generated by the Indian population against this virus drove researchers at All India Institute of Medical Sciences (AIIMS), Translational Health Science and Technology Institute (THSTI), Institute of Genomics and Integrative Biology (IGIB) and International Centre for Genetic Engineering and Biotechnology (ICGEB) to study this disease better.

About the study

According to the WHO, the severity of Dengue fever can be categorized into three distinct types- Severe Dengue (SD), Dengue Illness (DI) and Dengue with Warning Signs (DW). For this study, blood samples were collected from a cohort of 97 children suffering from any of the three classifications of this disease. Sixty percent of this population was found to be suffering from secondary infections rather than primary ones and Serotype 2 DENV was identified in most of the samples.

While studying the factors impacting viraemia (presence of virus in blood) in the given samples, it was found that disease severity had no direct linkage the viral load.

Also, the decrease in platelet count, which is considered to be one of the most recognized symptoms of this disease, seemed to be directly proportional to the increase of viral load in the blood. Researchers attribute this finding to the assumption that Dengue virus probably acts by altering or hampering the function of the host organism's platelets.

Interleukins and Interferons are cytokines that usually help in enhancing immune responses during infections. The role that these small proteins played during the course of the Dengue virus were also studied and the level of interferons in the blood were found to dictate a person's level of susceptibility while contracting the disease.

According to Dr. Medigeshi, "Dengue severity may either cause interferon levels to drop, or people with low interferon levels might be a susceptible population to dengue infections."

This is probably why interferon therapy was identified as a recovery measure in both the cases.

Using bioinformatics, markers of dengue disease severity and recovery were also identified and analysed .

“Through a systematic measurement of baseline factors, pre-disposability to dengue can be detected and target population identified very early in infection,” claimed Medigeshi.

Tackling this disease by studying it at the molecular level is bound to aid public health personnel and medical professionals in a significant way. Diagnosing and treating Dengue will become a relatively easier task if efforts are made to understand the virus and its subsequent effects better.

Studies like these have the possibility of translating into larger outcomes like better healthcare infrastructure and fewer number of reported Dengue cases per year.

<https://biotechn.asia/2016/07/09/insights-about-immune-response-to-dengue-virus-infection-can-help-fight-the-disease/>

DALIA SALDANHA | Jul 9, 2016

NIIST technology may aid PSUs in curbing pollution

CSIR-NIIST

The new technology developed by the National Institute for Interdisciplinary Science and Technology (NIIST) may help reduce acidic effluent flow from public sector undertakings (PSUs) such as Kerala Minerals and Metals Ltd (KMML) and Travancore Titanium Products (TTP) that causes deterioration of land and water bodies and pollution. The innovative technology developed by CSIR- NIIST to produce Titanium Dioxide (TiO₂) pigment from ilmenite ore from the black sands of Kerala will be a big boost to the PSUs, which are under attack from all corners for discharging polluting effluent.

While KMML causes land deterioration in areas around Chavara, effluent discharge from TTP pollutes Veli Lake. Also, the effluents are carcinogenic. These issues can be effectively addressed using the new technology. The TTP, which is involved in the production of titanium dioxide pigment, uses sulphate process using sulphuric acid to produce anatase grade TiO₂. It is considered lesser grade TiO₂ used for interior paints and electronic components, compared to KMML's rutile grade TiO₂ produced from chloride route using hydrochloric acid. The acidic discharge could be minimised further with the help of new technology.

The technology developed at NIIST proved successful in the production for titanium feedstock with more than 90% TiO₂ in laboratory and semi pilot plant scale.

"The process is most environment friendly with more than 70% reduction in acid consumption and bulk of the iron is removed in the form of oxides, free of excess acidity and chloride contamination," CSIR- NIIST director A Ajayaghosh said.

"I have apprised KMML of this technology and it could be inducted with minimum investment. I will also write to the ministry concerned to take it forward for such state PSUs," Ajayaghosh said.

NIIST senior scientist Harikrishna Bhat said, "This new technology assures to reduce acidic effluent discharge from 70% to 75% by removing iron from ilmenite". Ilmenite found in coastal sands of Kerala contains 58% titanium dioxide (TiO₂), iron and iron oxide. The technology involves removing iron from ilmenite through metallisation and rusting process to separate 80% to 85% TiO₂, which is called synthetic rutile.

<http://timesofindia.indiatimes.com/city/thiruvananthapuram/NIIST-technology-may-aid-PSUs-in-curbng-pollution/articleshow/53136706.cms>

TNN | July 10, 2016

Patent Office refuses patent to Italian research firm Indena to treat mucositis

CSIR

The Indian Patent Office has refused patent protection for a medicine of Italian research firm Indena SPA to treat Mucositis, a painful inflammation that occurs after chemo or radiotherapy treatment for cancer, in India. The office also refused a pre-grant opposition filed by a scientist in the Council of Scientific and Industrial Research (CSIR), Delhi against the application.

The patent application, submitted in January 2009 for approval, is for an invention related to the therapeutically effective amount of plant extracts that can be administered alone or in combination with a therapeutically effective amount of one or more anti-inflammatory agent and other pain removing agents and antifungal agent.

The invention is on methods for treating and preventing mucositis, in particular mucositis following the administration of chemotherapy drugs or a combination of said drugs with radiotherapy. Indena sells a Mucositis drug under the trade mark Samital.

The pre-grant opposition was filed by V K Gupta, CSIR, on December 2012 arguing that the use of various extracts for the treatment of various disease are known and claimed that the invention is not novel, not inventive and not patentable. He also submitted ancient Indian texts to substantiate his argument.

In its response, the company argued none of the exhibits cited by the opponent disclose a composition containing all the active ingredients, as claimed in the instant invention for the treatment of mucositis.

One of the side effects of radiotherapy, and above all chemotherapy, is mucositis, which normally affects the gastroenteric tracts especially the mouth, esophagus, stomach, intestine and vagina in women. It is a serious symptom and affects the quality of life of the patient. None of the traditional knowledge speaks about mucositis, it said.

The opponent did not attend the hearing and not submitted any written note of arguments in respect to the pre-grant opposition. The Patent Officer observed that the opponent failed to establish all the grounds of opposition under anticipation, obviousness and non-patentability and rejected the pre-grant opposition.

After considering various revised claims and arguments the official observed that, in view of the prior art documents the person skilled in the art can easily arrive at the instantly claimed combination without involving any inventive skill. Also instant application fails to provide any improved synergistic effect for the claimed combination.

The Patent Office refused to proceed with the application as it observed that the patent cannot be allowed based on various sections in the Patents Act.

http://www.business-standard.com/article/companies/patent-office-refuses-patent-for-italian-research-firm-indena-to-treat-mucositis-116071000263_1.html

Gireesh Babu | Chennai | Jul 10 2016

Chia in demand as enquiries from North Karnataka flood farmers

CSIR-CFTRI

Growers in north Karnataka want to experiment with the crop, which gave high returns last year

The handsome returns chia crop gave farmers in parts of the district last year has become a talking point among the farming community, not just in south Karnataka but also in the northern districts.

The Raitha Mitra Farmers' Producers' Company, which is in the forefront of promoting this crop of Mexican origin that is known for its high nutritional value, has been flooded with enquiries from farmers in north Karnataka who have been hit hard by successive droughts.

Chia has been described by food scientists as a 'super-food' because of its high-energy ingredients. The Raitha Mitra Farmers' Producers' Company, an entity of farmers founded in Mysuru, encouraged over 100 farmers to grow the crop last year. More than 10 tonnes of 'white chia' variety was grown and sold to food processing companies that had entered into purchase agreements with the company.

Each farmer got an assured Rs. 24,000 a quintal. "Last year, we sold chia worth Rs. 19 lakh. This year, we have plans of producing 30 tonnes by engaging 300 farmers. Already, many companies have come forward to buy the produce. CFTRI (Central Food Technological Research Institute) has supported us with its agro-technology for chia," said Raitha Mitra founder Kurubur Shanthakumar, who also heads the Sugarcane Growers' Association.



Treading with care

He told The Hindu that as many as 1,000 farmers from places such as Davangere, Belagavi, Yadgir, Chitradurga, Bagalkot and other districts, which are in the grip of an agrarian crisis, have sought seeds and support to cultivate the drought-resistant chia, whose cost of cultivation too is low.

“We cannot assure all the farmers marketing support as we are also new in this business and gradually making progress. We are treading carefully as we don’t want to take major risks and create a crisis as the ‘black chia’ grown by H.D. Kote farmers had remained unsold [last year],” he said.

Chia is known for its nutraceutical values as its seeds contain 30-35 per cent of oil that is a rich source of Omega-3 fatty acids. Raitha Mitra company has set up a processing plant at Hootagalli near here to ensure that farmers get the best price.

Two high-yielding varieties — CHIAmpion W-83 and CHIAmpion B-1 — have been developed by CFTRI.

Last year, we sold chia worth Rs. 19 lakh. This year, we plan to produce 30 tonnes by engaging 300 farmers.

Kurubur Shanthakumar,
Founder, Raitha Mitra Farmers’ Producers’ Company

<http://timesofindia.indiatimes.com/city/nagpur/A-smart-move-towards-a-greener-cleaner-city/articleshow/53026662.cms>

SHANKAR BENNUR | Jul 09 2016

NHAI, Neeri join hands to plant trees

CSIR-NEERI

Under fire from various quarters over poor rate of survival of trees planted, the National Highway Authority of India (NHAI) has tied up with the National Environmental Engineering and Research Institute (Neeri) for scientifically planting trees. An agreement was signed by the two agencies on Friday in the presence of union transport minister Nitin Gadkari. M Chandrashekhar, NHAI regional officer, told TOI that a 5km stretch of national highway near Jam would be handed over to Neeri for carrying out experiments. "The scientists will use different methods and patterns to plant trees over a period of five years. The one with the best results will be recommended to us and we will then replicate it all over the country," he said, adding that Neeri would be paid Rs11.8 crore for its services.

Chandrashekhar further said that the main objectives of plantation along national highways were providing aesthetic enhancement to the project corridors, reduce impact of air pollution and dust, provide shade, reduce impact of noise pollution, prevention of glare from headlights of incoming vehicles, climate amelioration, moderating the effect of wind and incoming radiation and highlight sharp horizontal curves during night.

"The Indian Road Congress (IRC) has recommended some guidelines for plantation strategy and plant species with reference to agro-climatic terrains. However, most of these recommendations are quite subjective. However, the objectives are of specific nature and have their own technicalities and need meticulous planning. Therefore, science and technological intervention are crucial for achieving these objectives," the NHAI official said.

NHAI expects that IRC guidelines would be utilized with the scientific and technical competent of Neeri under field conditions. Neeri will have to take care of the plantation for five years. Its task has been specified year wise in detail in the agreement. It will have to complete plantation before July 2017. In the fourth and fifth years, laboratory studies with field samples for data analysis had to be done. A large number of parameters will be studied including air purification, soil enrichment, water potential enhancement, ambient temperature maintenance and biomass generation. In addition to this, an ecological assessment will be done which will cover humidity build up, surface water runoff prevention, enhanced water percolation, biodiversity build up and microflora. The studies will be carried out in all four seasons.

- * Neeri will do experimental plantations and study the results
- * The objectives set by Indian Road Congress (IRC) are to be met
- * Neeri will suggest the best pattern and methodology for plantations
- * NHAI will do plantations as per the model suggested by Neeri all over India

<http://timesofindia.indiatimes.com/city/nagpur/NHAI-Neeri-join-hands-to-plant-trees/articleshow/53122596.cms>

Ashish Roy | Jul 9, 2016

Bombay HC directs BMC to make better, more lasting repairs of potholes

CSIR-CRRI

The court pointed to the increasing number of complaints on repairs of potholes, saying these indicated the work was being carried out on an ad hoc basis.

The Bombay High Court directed the Brihanmumbai Municipal Corporation (BMC) to find ways to repair potholes such that they do not reappear every few days. The court pointed to the increasing number of complaints on repairs of potholes, saying these indicated the work was being carried out on an ad hoc basis and that the civic body should be concerned. It added that even if the cost of repairing potholes goes up under new methods, the BMC should consider it.

Pointing to the interveners' claim that while a lot of money was being spent on repairing potholes, they would give way a few days later, Justice Kemkar said, "We are concerned about this aspect and it needs to be dealt with. Even if the cost of material rises, the repaired patch should last for a considerable time and this should be looked at as it will be beneficial for the public at large. The present material being used should also be monitored to ensure that it is not substandard."

The counsel appearing for the Central Road Research Institute (CRRI) Advait Sethna, informed the court that the Indian Road Congress under the Ministry of Road and Surface Transport has come up with guidelines for road repairs and there were various methods for road repairing recommended by the CRRI based on these guidelines. The court has now asked for the Indian Road Congress to be made a party to the petition.

<http://indianexpress.com/article/cities/mumbai/bombay-hc-directs-bmc-to-make-better-more-lasting-repairs-of-potholes-2902271/>

Express News Service | Mumbai | 9 July , 2016

Mumbai: Pothole repairs to continue at night

CSIR-CRRI

The Bombay High Court pulled up the BMC for the shoddy state of roads and directed the civic body to fix the pothole problem once and for all, even if it means spending more money or working late into the night.

“You’re carrying out repair works in a very ad hoc manner; this comes through in the media reports. We think if you spend more money on roads in the larger public interest, but use good material and monitor the work properly, the problem will be solved forever. Don’t use substandard material and keep facing the same problem,” said Justice Shantanu Kemkar, who, along with Justice Makarand Karnik, was hearing a 2013 suo motu petition regarding bad roads. With the pothole menace recurring every year, in the past hearing, the HC had gone to the extent of telling the civic body that it would have to pay compensation to those who meet with accidents due to potholes.

The bench also asked the traffic police to permit the civic body to carry out repairs at night, provided they follow the noise pollution rules. BMC has been directed to use sound barriers whenever it conducts night repairs. The High Court has scheduled the next hearing for July 15.



Technical assistance

While the BMC said that it was bringing in some new technology from Australia to solve the problem, the HC also told the corporation to take guidance from experts at the Central Road Research Institute (CRRI) and the Indian Road Congress, both of which carry out research and development on roads. “Such bodies can give you lots of suggestions. The expert body of BMC that is meeting on July 13 should also discuss to how the roads were washed away in just two to three spells of rain,” said Justice Kemkar.

App-ropriate action

Among the issues that came up was a problem with the corporation’s MCGM 24x7 app, which citizens can use to complain about potholes.

Senior counsel Jamshed Mistry, who has been appointed amicus curiae (friend of court), said, “The MCGM 24x7 app that was started by the civic body for complaints about potholes had some problems, and complainants were unable to load pictures on the app.”

However, BMC counsel Anil Sakhare told the bench that the app was working perfectly and perhaps it was the complainant’s Internet connection that had a problem.

Justice Kemkar then asked the civic body to make sure that once a complainant uploads pictures of potholes, the civic body should revert with a picture of the same location once the pothole is filled.

<http://www.mid-day.com/articles/mumbai-pothole-repairs-to-continue-at-night/17416164>

Vinay Dalvi | 9 July , 2016

Mystery over death of temple elephant

CSIR-CCMB

The cremation of the body of Sivasundaran, the elephant owned by Rajarajeswara temple in Thaliparamba in the district, which died on Thursday, was held on Friday night after autopsy amidst suspicion raised by the animal lovers.

Though the autopsy was planned on Thursday night, it was later postponed to Friday morning following the opposition of the animal lovers who alleged the elephant died because of the ill-treatment of the mahouts and the temple authorities did not take care of it.

The cremation process, which began in the temple premises, would take at least three days to complete, according to temple officials, who said the cremation is held as per religious rites. Since, there was suspicion raised about the elephant's death, the forest authorities have collected its blood sample and it would be subjected to detailed examination, said assistant forest conservator P Biju.

However, the animal lovers alleged that there was something mysterious in the way the authorities handled the case.

"Though we intervened and postponed the autopsy which the authorities were doing for the sake of formality, the sad thing is that the forest authorities and the animal husbandry department have not done anything to collect the viscera from the body of the elephant to send it for further examination to the nationally accredited Centre for Cellular & Molecular Biology (CCMB) Hyderabad to analyze the actual cause of death," said V K Venkatachalam, secretary of Heritage Animal Task Force, a Thrissur-based organization.

This type of death of an elephant at an age group of 20-25 is a classic example of killing an elephant with neglect and torture by its custodian, he said in the complaint to the Project Elephant, Kerala State Elephant Task Force, and other officials.

However, the temple authorities refuted the allegation and said they properly took care of the elephant and they were also equally concerned about the death of the elephant. They also said the ivory and teeth of the dead elephant have been given in the custody of the Forest officials.

<http://timesofindia.indiatimes.com/city/thiruvananthapuram/Mystery-over-death-of-temple-elephant/articleshow/53129097.cms>

P Sudhakaran | TNN | Jul 9, 2016