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Eureka

E-info letter

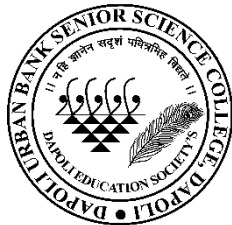
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(The editor and publisher may not agree with the views expressed in articles.)

GREEN COFFEE: THE QUEEN OF BEANS

Coffee is one of the most consumed and admired beverages, since thousands of years. Coffee, generally known for its distinct aroma and taste that favours the taste buds of most of the consumers. This could be probably one of the reasons why coffee is universally favourite. Coffee in its various forms, is being loved by the people of all ages and gender. But when it comes to enjoying coffee today the first thought comes is its benefits. And the question popped up '**Does coffee have some health benefits?**' Most remarkably, if you are drinking the popular coffee beverages doused with sweeteners, creamer, milk with fat and even flavouring then definitely you are missing out the therapeutic benefits and that may cause some harmful adverse effect to your health. So there is one option, green coffee does appear to have potential health benefits.

Green coffee is a major dietary source of polyphenols and phenolic acids. Polyphenols are the chief source of plant-based foods and beverages especially apples, berries, cocoa, tea, coffee, citrus, plums, broccoli and many others and cannot be synthesized by humans. Polyphenols are actually secondary metabolites produced or synthesized by plants and are being used for their defence mechanism against several biological and environmental stress. Several substantial epidemiological studies confirmed that polyphenol-rich diet can protect/ reduces the high risk of cardiovascular diseases and type 2 diabetics. The commonly recommended polyphenols in the diet are flavanols, flavanones, flavonols, and anthocyanins. Daily consumption of five or more portion of dietary polyphenol-rich fruits and vegetables as a healthy diet is recommended. The basic and clinical research on multiple functions of

polyphenols in human health is well known but it is very difficult to understand what "dose" of a "specific" polyphenols should be consumed to get maximum benefits.

The modern lifestyle and food habitats have caused enormous adverse health effects including diseases like diabetes, heart problems, high blood pressure and have spread to every liming family. As a result, medical field are probing for a natural agent that can help to cure or reduce the risk of health problems. Green coffee beans are raw, unroasted beans with biochemical compounds such as caffeine, dietary polyphenols especially Chlorogenic acid, amino acids, lipids, carbohydrates, vitamin -B complex and Vitamin C, lots of minerals and enzymes. Green coffee beans are the prime source of hydroxycinnamic acids. The most abundant coffee polyphenols are Caffeic acid and its derivative Chlorogenic acid (CGA). These important polyphenols can be arrested in green coffee extract. The increasing demand for green coffee bean extract is geared up by several ostensible health benefits rendering to antioxidants and pharmacologically active constituents. These prime constituents are associated with weight loss, mood enhancer, effectiveness against hypertension, and also with anticancer properties. The demand and consumption of green coffee have been increasing day by day due to its health properties. The coffee what we prefer is roasted coffee beans which are ready to brew. The roasting process changes the colour, flavour and odour of green beans leading to 11-45 % polyphenol degradation and 8-10% degradation of Chlorogenic acid. Due to this important loss, green beans have the potential to be a better source of dietary polyphenols than the roasted ones. Thus,

the global market for green coffee bean extract is poised with an impressive growth rate in the last five years. The growing demand and popularity of green coffee beans as weight loss supplement is actually the key feature of driving the market. Several studies and coffee industry personals are trying to find out as well as to enhance and get the better functional profile of green coffee beans so that it can be used more as a significant supplement for facilitated to obesity. For this reason, green coffee is now getting attention as a potent health elixir.

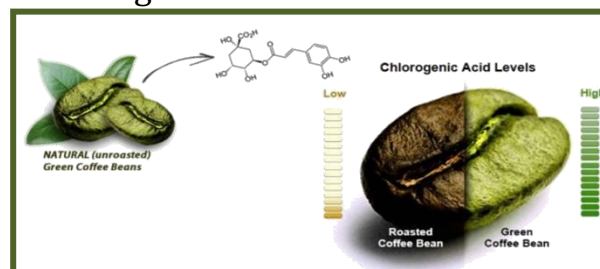


The green coffee beans are gaining much more attention in functional food and modern nutrition. Modern nutrition is vast and multidisciplinary area includes epidemiology, food science and medicine, biochemistry, behaviour science and chemistry. Besides this food habit, food choice, availability of food, calories consumed, genetics and energy expenditure are some additional factors. Daily consumption of food throughout life is must for human beings. This daily consumption of food accomplished with biological effects that will occur every day. The unique composition and properties of green coffee has gained tremendous interest of consumers.

CGA: The magical green coffee polyphenol

Since long time coffee, has been more explored for caffeine and its beneficial effects. However, coffee contains many dietary polyphenols, especially CGAs with pronounced antioxidant abilities. One of the major coffee polyphenols is caffeoylquinic acid, generally called as

Chlorogenic acid (CGA), an ester of caffeic acid with quinic acid. Quinic acid is the main culprit that causes acidity related syndrome in consumers. Compared to green coffee, in roasted beans more quinic acid is found mainly due to the degradation of the CGA s at high roasting temperature. Besides this, there are several CGA isomers which differ as per accessions (10-14%). Phenolic compounds found in green coffee beans are mainly the Chlorogenic acid (12% of solids), which are the esters of trans-cinnamic acids and quinic acids. Types of CGA found in green coffee beans include caffeoylquinic, feruloylquinic, p-coumaroylquinic, di methoxy cinnamoylquinic, dicaffeoylquinic, diferuloyl quinic, di-p-coumaroylquinic, feruloylcaffeoyl quinic, dimethoxycinnamoylcaffeoylquinic, di methoxy cinnamoylferuloylquinic, p-coumaroylcaffeoylquinic, p-coumaroylferuloylquinic and p-coumaroyldimethoxycinnamoylquinic acids. CGA is a biologically active phenol highly praised for its wide array of health benefits. Depending upon the variety of coffee, the CGA per cup (200 ml) varies from 70 to 350 mg. In general Robusta beans contain the more CGA than the Arabica. Although green coffee beans does contain more CGA which is beneficial, it does have some caffeine that aids metabolism by 3-11% however the main active ingredient is believed to be CGA.



The information regarding the metabolism of CGA and its bioavailability in human is scanty. CGA is well known for its antioxidant, anti-carcinogenic and for anti-inflammatory potential; and have been

extensively confirmed by several epidemiological studies. It has also been useful in type-2 diabetes, obesity, stroke, blood pressure and Alzheimer's disease.

CGA and Human health

The dietary consumption of Chlorogenic acid causes noteworthy decline in blood pressure. CGA improves endothelial functions and the mechanism of CGA is attributed to the high antioxidant and anti-inflammatory properties, regardless of this it also hold a special property that can regulate the vascular tone.

The glycometabolic disorders linked with the risk of non-alcoholic fatty liver diseases and even cardiovascular diseases (CVD). It is well-known that CGA amend glucose and lipid metabolism by improving insulin response and early fasting plasma glucose.

Obesity is one of the major reasons for developing different types of diabetes mellitus and has become a serious health issue worldwide. Obesity leads into 80-85% of risk of developing type-2 diabetes along with sleep apnea and may be leading cause of preventable death. The unaffordable expenditure for medicinal weight loss, health-conscious peoples are switching to nutraceuticals as alternatives. CGA mediates antiobesity through the adjustment of obesity-related hormones and also by upregulating liver fatty acid oxidation and downregulating the cholesterol and fatty acid biosynthesis. CGA has a vigorous action on lipid peroxidation. It is identified for its antioxidant activities linked to free radical scavenging feature.

CGA is also improving lipid peroxidation as well as metalloproteinase expression and activity. In addition to this CGA is being linked with antioxidant action and also helps to alter physiological and pathological conditions *via* the anti-inflammatory mechanism. In some reports, it is evident that Green coffee

extract (GCE) showed significant anti-inflammatory action through improving paw edema and formalin-induced pain in mice. CGA is also reported to have beneficial effects on neuropathic pain.

Due to all these wide spectra of health benefit potential including anti-diabetic, weight loss, anti-inflammatory, antibacterial and anticarcinogenic effects, CGA has gained immense attraction and limelight. It is a potent antioxidant agent and one of the prime phenolic compounds of green coffee beans which contribute to 10-14% of raw coffee by weight. The food and beverage industry is unquestionably paved with a multitude of trends over the years. Likewise, the coffee market has become a safe heaven for tasting experiments and experiences. Green coffee bean extract concocted from unroasted green beans that give typical greenish colour to the beverage with mild and refreshing flavour along with a package of health benefits. Coffee offers dose dependent response in consumers, hence moderate consumption of green coffee is good for health, unless opted for a refined formulation for easing a specific health problem. Thus, considering all the important health benefits of CGA in green coffee; there is no doubt for the green coffee as queen of beans.

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Article by

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A gel made from urea has molecules that resemble friendship bracelets



A gel can be made from urea

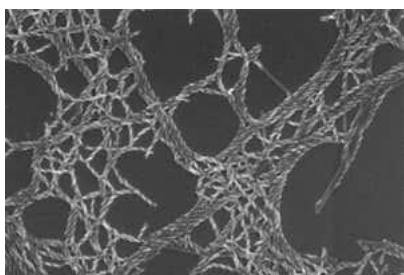
A gel made from the main compound in urine looks just like a friendship bracelet. It is formed of minuscule fibres that spontaneously form braids and could be used to engineer new medicines.

Jonathan Steed at Durham University in the UK and his colleagues created the gel using urea. On a molecular level, the gel assembles itself into four-stranded braids, in two different configurations.

The simplest four-stranded braid is a quadruple helix – similar to the double helix of DNA, but with four strands winding in parallel. The other is in the form of two double helices weaving in and out of one another.

“We’ve designed a toy molecule that we can watch forming these rather beautiful braids,” says Steed.

Although their molecule was engineered, braids like this can appear naturally. For example, in mad cow disease, fibres of amyloid proteins form braids and clump together.



Braids made using urea

The team has used similar urea-based gels to produce pharmaceuticals with different properties.

“We crystallise new drug molecules within them and sometimes find different crystal packing arrangements,” says Steed. The different resulting structures can alter the drug’s solubility and how much of it reaches a person’s bloodstream after it is taken.

The new molecule is stickier than gels the researchers have previously produced and may help to better control the properties of the molecules they design.

“You might imagine a situation where, for example, you can braid fibres in one way and you get something which is ketchup-like and you can braid them another way and you get something that’s like a rubber ball,” says Steed. “If you can produce different microstructures with the same molecule, then you can get materials with different properties.”

Reference:

Nature Chemistry, DOI: 10.1038/s41557-019-0222-0

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Green Consumerism

The concept of Green consumerism needs hours. Green means which is not harmful to the environment and consumerism means demands from customers. Hence green consumerism means customers have a high demand for green products or ecofriendly products. Green consumerism is an act of belief; it starts with what you put your mind into. Green consumerism is often seen as a driver for big corporations to change the way they create their products and to address important issues like sustainability. With a positive mindset about green consumerism, we all can play a key role in protecting the environment around campus and the community.

Even though there is no evidence proving that things will get worse or better, it should not stop us from doing something like changing our consumption. Green consumerism is when a consumer demands or chooses products that are less harmful to the environment. It is a social behavior that promotes the use of eco-friendly (or green) products. Green consumerism is not just about buying eco-friendly products; it can be practicing recycling, conserving, or using public transportation instead of driving. However, the price of green products shouldn't be a challenge but an opportunity to push companies to make possible changes to their products and services, a reason why green consumerism is necessary to promote sustainability.



How become a part of Green consumerism

- Changing our mindset: We can see all over the news and social media feeds about climate change, global warming, but we do not quite understand how to act on it or where to even begin this journey.
- Buy local food products (or organic): I know from experience most organic products are not the most affordable, but we can attend our local farmers markets or stores
- Recycling: As we all know; materials and natural resources cannot be wasted when you transform them into something new. Society can recycle by learning how and where to recycle items.
- Reducing energy consumption: Sometimes we do not think about the lamp or television we forget to turn off, but doing so saves energy choosing energy efficient products is also a good way to protect the environment.
- Taking public transportation: Public transportation helps to reduce congestion and carbon emissions, and gives an opportunity to meet people. By using public transportation, more fossil fuels are conserved, and it could have an important impact on air quality.
- Getting involved with your green campus: There are a thousand ways to get involved in sustainability. For example, join an environmental club or be aware of activities on campus involving a green lifestyle.

Green consumerism is an act of belief; it starts with what you put your mind into. Green consumerism is often seen as a driver for big corporations to change the way they create their products and to address important issues like sustainability. With a positive mindset about green consumerism, we all can play a key role in protecting the environment around campus

and the community. The future prospects of green consumerism are promising as consumers increasingly prioritize sustainability in their purchasing decisions. This trend is driven by a growing concern for the environment, the recognition of the impact of consumer choices on the planet, and the desire to support companies that prioritize environmental responsibility.

Several channels play a crucial role in promoting and facilitating green consumerism:

1. **E-commerce platforms:** Online marketplaces provide a platform for consumers to access a wide range of sustainable products and easily compare options. Many platforms also provide sustainability labels and certifications to help consumers choose environmentally friendly products.

2. **Social media and influencers:** Social media platforms allow individuals and organizations to raise awareness about sustainable products, lifestyles, and practices. Influencers and eco-bloggers play a significant role in promoting green consumerism by sharing their experiences, recommendations, and tips.

3. **Sustainable brands and eco-labels:** More companies are adopting sustainable practices and offering eco-friendly products. Brands that prioritize sustainability often use eco-labels and certifications to communicate their commitment to environmental responsibility, making it easier for consumers to identify and choose these products.

4. **Retail stores and local markets:** Traditional brick-and-mortar retail stores and local farmers' markets also play a role in promoting green consumerism. These physical locations allow consumers to directly interact with sellers, ask questions, and make informed choices about sustainable products.

5. **Government policies and regulations:** Governments can incentivize green consumerism through policies and regulations. These can include tax incentives for eco-friendly products, regulations on packaging and waste management, and support for renewable energy sources.

The future of green consumerism depends on several factors, including increased awareness and education, the availability and affordability of sustainable products, and continued support from companies and governments. As more consumers prioritize sustainability and demand greener options, businesses are likely to respond by offering more environmentally friendly choices. This positive feedback loop between consumers and companies has the potential to drive significant changes in production practices and create a more sustainable future.

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Article by

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ETHICAL HACKING

Ethical hacking involves an authorized attempt to gain unauthorized access to a computer system, application, or data. Carrying out an ethical hack involves duplicating strategies and actions of malicious attackers. This practice helps to identify security vulnerabilities which can then be resolved before a malicious attacker has the opportunity to exploit them.

What is an ethical hacker?

Also known as “white hats,” [ethical hackers](#) are security experts that perform these security assessments. The proactive work they do helps to improve an organization’s security posture. With prior approval from the organization or owner of the IT asset, the mission of ethical hacking is opposite from malicious hacking.

How are ethical hackers different than malicious hackers?

Ethical hackers use their knowledge to secure and improve the technology of organizations. They provide an essential service to these organizations by looking for vulnerabilities that can lead to a security breach.

An ethical hacker reports the identified vulnerabilities to the organization. Additionally, they provide remediation advice. In many cases, with the organization’s consent, the ethical hacker performs a re-test to ensure the vulnerabilities are fully resolved. Malicious hackers intend to gain unauthorized access to a resource (the more sensitive the better) for financial gain or personal recognition. Some malicious hackers deface websites or crash backend servers for fun, reputation damage, or to cause financial loss. The methods used and vulnerabilities found remain unreported.

They aren’t concerned with improving the organizations security posture.

What are some limitations of ethical hacking?

- **Limited scope.** Ethical hackers cannot progress beyond a defined scope to make an attack successful. However, it’s not unreasonable to discuss out of scope attack potential with the organization.
- **Resource constraints.** Malicious hackers don’t have time constraints that ethical hackers often face. Computing power and budget are additional constraints of ethical hackers.
- **Restricted methods.** Some organizations ask experts to avoid test cases that lead the servers to crash (e.g., Denial of Service (DoS) attacks).

What is penetration testing

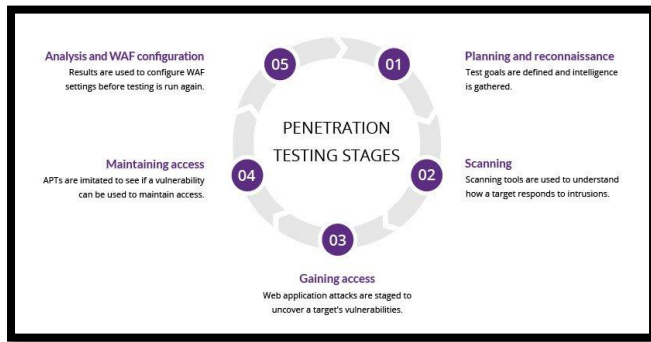
A penetration test, also known as a pen test, is a simulated cyber-attack against your computer system to check for exploitable vulnerabilities. In the context of web application security, penetration testing is commonly used to augment a web application firewall (WAF).

Pen testing can involve the attempted breaching of any number of application systems, (e.g., application protocol interfaces (APIs), frontend/backend servers) to uncover vulnerabilities, such as unsensitized inputs that are susceptible to code injection attacks.

Insights provided by the penetration test can be used to fine-tune your WAF security policies and patch detected vulnerabilities.

Penetration testing stages

The pen testing process can be broken down into five stages.



1. Planning and reconnaissance

The first stage involves:

- Defining the scope and goals of a test, including the systems to be addressed and the testing methods to be used.
- Gathering intelligence (e.g., network and domain names, mail server) to better understand how a target works and its potential vulnerabilities.

2. Scanning

The next step is to understand how the target application will respond to various intrusion attempts. This is typically done using:

- **Static analysis** – Inspecting an application's code to estimate the way it behaves while running. These tools can scan the entirety of the code in a single pass.
- **Dynamic analysis** – Inspecting an application's code in a running state. This is a more practical way of scanning, as it provides a real-time view into an application's performance.

3. Gaining Access

This stage uses web application attacks, such as cross-site scripting, SQL injection and backdoors, to uncover a target's vulnerabilities. Testers then try and exploit these vulnerabilities, typically by escalating privileges, stealing data, intercepting traffic, etc., to understand the damage they can cause.

4. Maintaining access

The goal of this stage is to see if the

vulnerability can be used to achieve a persistent presence in the exploited system— long enough for a bad actor to gain in-depth access. The idea is to imitate advanced persistent threats, which often remain in a system for months in order to steal an organization's most sensitive data.

5. Analysis

The results of the penetration test are then compiled into a report detailing:

- Specific vulnerabilities that were exploited
- Sensitive data that was accessed
- The amount of time the pen tester was able to remain in the system undetected

This information is analysed by security personnel to help configure an enterprise's WAF settings and other application security solutions to patch vulnerabilities and protect against future attacks.

Penetration testing methods

External testing

External penetration tests target the assets of a company that are visible on the internet, e.g., the web application itself, the company website, and email and domain name servers (DNS). The goal is to gain access and extract valuable data.

Internal testing

In an internal test, a tester with access to an application behind its firewall simulates an attack by a malicious insider. This isn't necessarily simulating a rogue employee. A common starting scenario can be an employee whose credentials were stolen due to a phishing attack.

Blind testing

In a blind test, a tester is only given the name of the enterprise that's being targeted. This gives security personnel a real-time look into how an actual application assault would take place.

Double-blind testing

In a double-blind test, security personnel have no prior knowledge of the simulated attack. As in the real world, they won't have any time to shore up their defences before an attempted breach.

Targeted testing

In this scenario, both the tester and security personnel work together and keep each other apprised of their movements. This is a valuable training exercise that provides a security team with real-time feedback from a hacker's point of view.

Reference:

<https://www.imperva.com>

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Climate protection: Land use changes cause the carbon sink to decline



Terrestrial carbon sinks can mitigate the greenhouse effect. Researchers of Karlsruhe Institute of Technology (KIT) and other research institutions pooled various data sources and found that European carbon storage takes place mainly in surface biomass in East Europe. However, changes of land use in particular have caused this carbon sink to decline. The researchers report in *Communications Earth & Environment*.

Forests can bind large amounts of carbon on the land surface. In this way, they decisively contribute to reducing net greenhouse gas emissions. For some areas, however, data are still lacking. In East Europe, in particular, the network of installed measurement stations is very loose, such that little has been known about carbon flows and their drivers there. "But East European forests have a great potential as a long-term carbon sink," says Karina Winkler from the Atmospheric Environmental Research Department of the Institute of Meteorology and Climate Research (IMK-IFU), KIT's Campus Alpine in Garmisch-Partenkirchen. "Political upheavals in East Europe, however, have caused big changes of land use. Moreover, climate change there increasingly affects the forests. This unique interaction of socioeconomic and climatic factors influences the carbon sinks."

However, data also show that carbon absorption in East Europe with time was anything but constant and has even declined. The East European carbon sink is shrinking. To determine the causes, researchers compared the trends of carbon changes with factors of land use, such as land conversion for agriculture, timber extraction, and share of abandoned agricultural areas, as well as with environmental factors, such as temperature, precipitation, soil humidity, and carbon dioxide (CO₂) and nitrogen concentrations in the atmosphere.

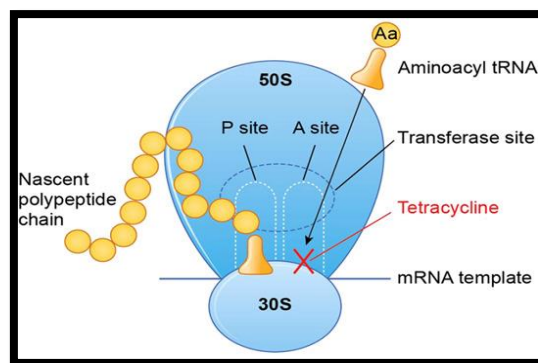
The researchers are now working to predict how East European forests and their important carbon sinks will develop under the influence of land use changes and climate change in future. In view of the increasing number of extreme weather events and reduced water availability, however, they fear that the East European carbon sink will continue to decline.

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Antibiotics And Their Production, Mechanism of action



Tetracycline

Antibiotics are medicines that fight bacterial infections in people and animals. They work by killing the bacteria or by making it hard for the bacteria to grow and multiply. Antibiotics prepared from microorganisms to inhibit growth of other microorganisms. They show their activity by inhibiting bacterial cell wall synthesis, protein synthesis, nucleic acid synthesis such as DNA and RNA of bacterial cell. Different antibiotics have different activities; they have various mechanisms of action on bacteria. So they can stop growth of bacteria and treat infections. There are many antibiotics available in the market, one of them is tetracycline. It is produced naturally by the *Streptomyces* genus of bacteria.

Tetracyclines (tetracycline, doxycycline, minocycline) are a class of medication used to manage and treat various bacterial infections and are considered to be broad-spectrum, meaning they are effective against large numbers of microorganisms. Tetracycline is used against bacterial infections of the skin, intestines, respiratory tract, urinary tract, genitals, lymph nodes, and other body systems. The first compound belonging to the tetracycline family, chlortetracycline, was discovered in 1948 by Dr. Benjamin Duggar. Chlortetracycline was isolated from *Streptomyces aureofaciens*, naturally present in the soil and called aureomycin because of the gold coloring of the bacteria. Two years later, a second isolated tetracycline, terramycin (oxytetracycline) was synthesized by the bacteria *Streptomyces rimosus*.

Tetracycline antibiotics are protein synthesis inhibitors. A protein synthesis inhibitor is a substance that stops or slows the growth or proliferation of cells by disrupting the processes that lead directly to the generation of new proteins. They inhibit protein synthesis in bacteria by binding to the ribosomes. Bacterial ribosomes are made up of two subunits, 50S and 30S. Tetracycline binds to the 30S subunit and inhibits protein synthesis in bacteria. This action prevents the binding of t-RNA to the m-RNA ribosome complex, thereby inhibiting bacterial protein synthesis.

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Gaganyaan

History

The primary mandate of HSFC is to spearhead ISRO's Gaganyaan programme through co-ordinated efforts and focus all the activities that are carried out in other ISRO centres, research labs in India, Indian academia and Industries towards accomplishing the mission. HSFC, as the lead Centre for Human space flight activities conforms to high standards of reliability and human safety in undertaking R&D activities in new technology areas, such as life support systems, Human Factors Engineering, Bioastronautics, Crew training and Human rating & certification. These areas would constitute important components for future sustained human space flight activities like rendezvous and docking, space station building and interplanetary collaborative manned missions to Moon/Mars and near-earth asteroids.

Introduction

Gaganyaan project envisages demonstration of human spaceflight capability by launching crew of 3 members to an orbit of 400 km for a 3 days mission and bring them back safely to earth, by landing in Indian sea waters. The project is accomplished through an optimal strategy by considering inhouse expertise, experience of Indian industry, intellectual capabilities of Indian academia & research institutions along with cutting edge technologies available with international agencies. The prerequisites for Gaganyaan mission include development of many critical technologies including human rated launch vehicle for carrying crew safely to space, Life Support System to provide

an earth like environment to crew in space, crew emergency escape provision and evolving crew management aspects for training, recovery and rehabilitation of crew.

Various precursor missions are planned for demonstrating the Technology Preparedness Levels before carrying out the actual Human Space Flight mission. These demonstrator missions include Integrated Air Drop Test (IADT), Pad Abort Test (PAT) and Test Vehicle (TV) flights. Safety and reliability of all systems will be proven in unmanned missions preceding manned mission

Humanrated LVM3-HLVM3

LVM3 rocket- The well proven and reliable heavy lift launcher of ISRO, is identified as the launch vehicle for Gaganyaan mission. It consists of solid stage, liquid stage and cryogenic stage. All systems in LVM3 launch vehicle are re-configured to meet human

Rating requirements and christened Human Rated LVM3. HLVM3 will be capable of launching the Orbital Module to an intended Low Earth Orbit of 400 km.

HLVM3 consists of Crew Escape System (CES) powered by a set of quick acting, highburn rate solid motors which ensures that Crew Module along with crew is taken to a safe distance in case of any emergency either at launch pad or during ascent phase.

L- Orbital module

Orbital Module (OM) that will be Orbiting Earth comprises of Crew Module (CM) and Service Module (SM). DM is equipped with state-of-the-art

avionics systems with adequate redundancy considering human safety. CM is the habitable space with Earth like environment in space for the crew. It is of double walled construction consisting of pressurized metallic Inner Structure and unpressurised External Structure with Thermal Protection System (TPS). It houses the crew interfaces, human centric products, life support system, avionics and deceleration systems. It is also designed for re-entry to ensure safety of the crew during descent till touchdown.

SM will be used for providing necessary support to CM while in orbit. It is an unpressurized structure containing thermal system, propulsion system, power systems, avionics systems and deployment mechanisms.

New technologies being developed for Gaganyaan. Human safety is of paramount importance in Gaganyaan mission. In order to ensure the same, various new technologies comprising of Engineering systems and Human centric systems are being developed and realised.

Crew training for Gaganyaan

Astronaut Training Facility established in Bengaluru caters to Classroom training. Physical Fitness training, Simulator training and Flight suit training. Training modules cover academic courses, Gaganyaan Flight Systems, Micro-gravity familiarization through Parabolic Flights, Aero-medical training, Recovery & Survival training, mastering of Flight Procedures and training on Crew Training Simulators. Aero medical training. Periodical flying practice and Yoga are also included as part of the training

Benefits

- Enhances Science & Technology Levels of the Country
- National project involving other Institutes, Academics and industry
- Improves Industrial Growth
- Inspires Youth to take challenges in Science Technology
- Technologies developed for societal benefits
- Additional Human Resource Development
- Provides way for the international Collaboration Policies

References:-

- 1) www.google.com
- 2) www.quora.com

Article by:

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Flamingo- Tall, pink wading bird



Each of the six species of tall, pink wading birds with strong bills that point down are considered flamingos (order Phoenicopteriformes). Flamingos have long, beautiful necks, big wings, and short tails. They also have slender legs. They stand between 90 to 150 cm (3 and 5 ft) tall.

Flamingos are extremely social birds. Hundreds-strong flocks can be observed wading in groups along the shore and flying in long, curved patterns. During the breeding season, over a million lesser flamingos (*Phoeniconaias minor*) congregate on some of East Africa's big lakes. Flamingos make an impressive and lovely picture when they are in flight, with their legs and neck stretched out straight and resembling white and rosy crosses with black arms. The flock at sleep, with their long necks curled or twisting around the body in every imaginable manner, is just as fascinating. It's common to observe flamingos standing on one leg. Numerous explanations for this behaviour have been put forth, including

energy conservation, body temperature regulation, or simple leg drying. Both parents share the month-long incubation of the one or two chalky-white eggs that are placed in the hollow of the cone. The nest is a truncated cone of muddy clay built up a few inches high in a shallow lagoon. In two to three days, downy white chicks leave the nest and are nourished by the adults repeating partially digested food. White sub adults eventually develop the pink plumage as they get older.

Flamingos use their webbed feet to mix up organic materials as they trudge through the shallows in search of food. They consume a variety of foods, such as diatoms, blue-green algae, algae, and invertebrates including tiny mollusks and crustaceans. With the help of tiny comb-like structures inside the bill, food is strained from the murky water as the head swings from side to side. The carotenoid pigments in the bird's food are what give it its pink colour. To prevent the fading of their plumage, food colouring is often added to the diet of flamingos maintained in zoos. On the Atlantic Ocean and Gulf of Mexico coasts in tropical and subtropical America, the greater flamingo (*Phoenicopterus ruber*) breeds in sizable colonies. The larger flamingo has two subspecies: the Caribbean flamingo (*P. ruber ruber*) and the Old World flamingo (*P. ruber roseus*), which lives in Africa, southern Europe, and Asia. Primarily an inland species, the Chilean flamingo (*Phoenicopterus chilensis*) is found in Chile. The Andean flamingo (*Phoenicoparrus andinus*) and the puna, or James's, flamingo, are two lesser

species that reside high in the Andes Mountains of South America (*Phoenicoparrus jamesi*). Both the former and the latter have pink bands on each of their yellow legs, whereas the latter was believed to be extinct until an isolated population was found in 1956.

References:

- [flamingo | Description, Feeding, Images, & Facts | Britannica](https://www.britannica.com/animal/flamingo-bird)<https://www.britannica.com/animal/flamingo-bird>

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