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समाचार पत्रों से चयनित अंश

Newspapers Clippings

डीआरडीओ समुदाय को डीआरडीओ प्रौद्योगिकियों, रक्षा प्रौद्योगिकियों, रक्षा नीतियों, अंतर्राष्ट्रीय संबंधों और विज्ञान एवं प्रौद्योगिकी की नूतन जानकारी से अवगत कराने हेतु दैनिक सेवा

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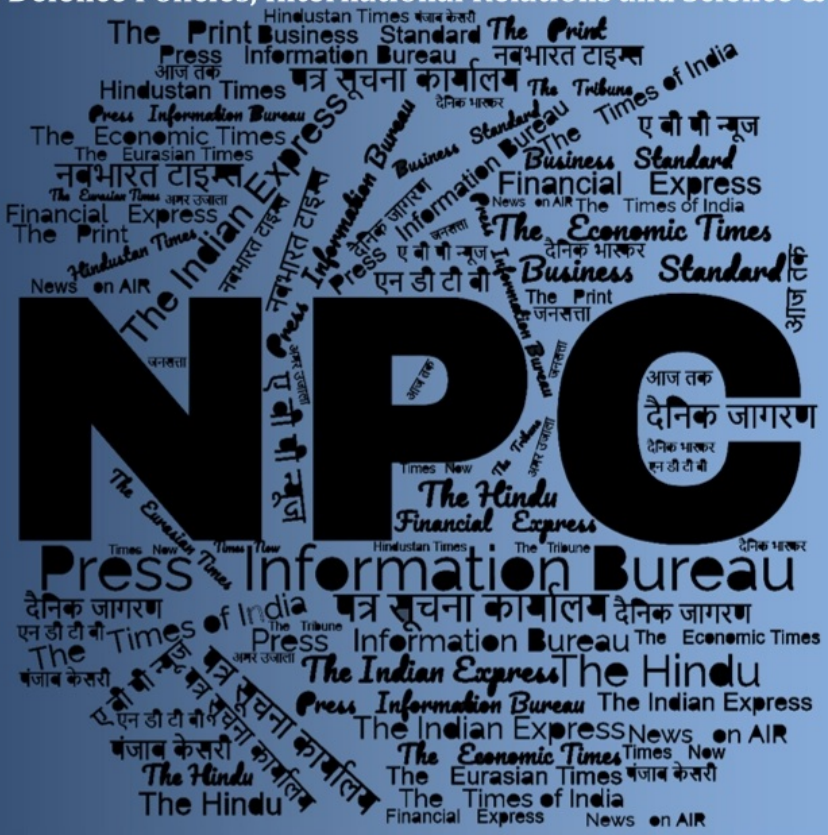

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Defence News

MoD to tweak procedures for acquisition of weapons & equipment

Source: The Tribune, Dt. 20 Jun 2025

In an attempt to streamline the process of acquiring weapons and equipment to match the pace of technology change, the Ministry of Defence has initiated a review of Defence Acquisition Procedure 2020.

The Ministry of Defence has set up a committee to carry out extensive deliberations with all stakeholders. Former IAS officer Apurva Chandra, who has previously worked as Director General Acquisition, will be the principal advisor to the committee.

The aim of the review is to align the pace of acquisition to meet the operational requirements and modernisation of the armed forces. Among the focus area is to encourage in design and development in both public and private sectors. Start-ups, innovators, and the private defence industry will be priority for indigenous technology infusion.

Among other targets is to align acquisition procedures to achieve self-reliance by promoting technology infusion through indigenously designed and developed systems. Also to establish India as a global defence manufacturing and maintenance repair and overhaul hub.

The reformed DAP will look to have procedures that enable ‘Make in India' by promoting defence manufacturing in India through facilitation of joint ventures and transfer of technology for the private sector. This will encourage foreign original equipment manufacturers to use the FDI route.

The committee has invited suggestions on what kind of policy and procedural changes are needed to streamline acquisition processes, ease of doing business, conduct of trials of equipment, fast track procedures, and adoption of new technologies such as AI. Suggestions can be mailed by July 5 and can be emailed to secy-dap2025@gov.in

The committee includes senior officers from MoD, representatives from the defence industry and academia.

https://www.tribuneindia.com/news/india/mod-to-tweak-procedures-for-acquisition-of-weapons-equipment/

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Defence ministry sets up panel to review acquisition procedure

Source: Hindustan Times, Dt. 20 Jun 2025

The defence ministry on Thursday said it has set up a high-powered committee, headed by the director general (acquisition), to steer a comprehensive review of the Defence Acquisition Procedure (DAP) 2020 for speedy modernisation of the armed forces and boosting self-reliance in the critical sector.

The panel includes senior officers from the ministry, representatives from the defence industry and academia.

“Following the declaration of 2025 as the ‘year of reforms’, the defence ministry has initiated a comprehensive review of the DAP 2020 to align it with existing government policies and initiatives. A committee headed by the director general (acquisition) has been constituted to carry out extensive deliberations with all stakeholders,” the defence ministry said. The panel has begun consultations with the stakeholders and invited suggestions from them by July 5.

The aim of the review, the ministry said, is to meet the operational requirements and modernisation needs of the armed forces in a timely manner to ensure national security and achieve “atmanirbharta” (self-reliance) goals by promoting technology infusion through indigenously designed and developed systems.

It also seeks to boost the Make-in-India initiative by promoting defence manufacturing through facilitation of joint ventures and transfer of technology for the private sector, encouraging foreign original equipment manufacturers to invest in the country and establish India as a global defence manufacturing and MRO (maintenance, repair and overhaul) hub, the ministry said in a statement.

Another goal is to “promote design and development in both public and private sectors, with a focus on startups, innovators, and the private defence industry for indigenous technology infusion”.

The panel was formed weeks after India launched Operation Sindoor in the early hours of May 7 and struck terror and military installations in Pakistan and Pakistan-occupied Kashmir (PoK) following the Pahalgam terror strike in which 26 people were shot dead.

It triggered a four-day military confrontation with Pakistan before the two sides reached an understanding on stopping all military action on May 10.

Indian forces deployed several indigenous weapons during the clash.

The panel has sought suggestions from stakeholders on a raft of issues including policy/procedural changes to streamline the acquisition processes, ease of doing business, conduct of trials, post-contract management, fast-track procedures, adoption of new technologies including artificial intelligence, and language improvements to eliminate ambiguity and enhance procedural clarity in the DAP.

On May 30, defence secretary Rajesh Kumar Singh said DAP 2020, the document that spells out the complex procurement process, is being revisited to reflect current realities.

He said the government is taking steps to shorten the weapon procurement cycle and has already cut it by more than a year -- a move aimed at accelerating the modernisation of the armed forces.

“The defence ministry has already, in the year of reforms, slashed the timelines for some of the processes in the procurement cycle. This would save about 69 weeks overall in the process timeline,” he said at a defence conclave.

There is a need to shift away from the traditional nomination-based procurement focused mostly on the public sector to a more competitive pricing model where both the public and private sector can compete for orders, he said, adding this approach is already being implemented for shipbuilding and recently for the AMCA (advanced medium combat aircraft) project.

The defence ministry has declared 2025 as the year of reforms aimed at transforming the military into a technologically advanced, combat-ready force capable of tackling new challenges.

The nine areas identified by the defence ministry for focused intervention include simplifying weapons buying procedures, setting up of integrated theatre commands for the best use of the military's resources to fight future wars, and new domains such as cyber and space.

On May 29, the chief of the air staff Air Chief Marshal AP Singh put the spotlight on the armed forces' agonising wait for new weapons and systems, saying he could not recall a single instance of a project being executed on time, in what was seen as a wake-up call for the country's defence production sector.

"Timelines are a big issue," Singh said at the time.

https://www.hindustantimes.com/india-news/defence-ministry-sets-up-panel-to-review-acquisition-procedure-101750359011444.html

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रक्षा खरीद प्रक्रिया 2020 की व्यापक समीक्षा के लिए समिति गाथित

Source: Punjab Kesari, Dt. 20 Jun 2025

नई दिल्ली, (पंजाब केसरी) : रक्षा खरीद प्रक्रिया (डीएपी) 2020 की व्यापक समीक्षा के मद्देनजर सभी हितधारकों के साथ व्यापक विचार-विमर्श करने के लिए महानिदेशक (खरीद) की अध्यक्षता में एक समिति गठित की गई है, ताकि इसे सरकार की मौजूदा नीतियों और पहल के साथ ''संरेखित'' किया जा सके।

रक्षा मंत्रालय के अनुसार, इस समीक्षा का उद्देश्य राष्ट्रीय सुरक्षा सुनिश्चित करने के लिए समय पर ''सशस्त्र बलों की अभियानगत आवश्यकताओं और आधुनिकीकरण'' को पूरा करना है। मंत्रालय ने कहा कि इसके अलावा, इसका उद्देश्य केंद्र की नीतियों और पहलों के साथ खरीद प्रक्रियाओं को

आत्मनिर्भरता हासिल की जा सके और 'मेक इन इंडिया' को सक्षम बनाया जाए

संरेखित करना भी है ताकि क्षेत्र में ''आत्मनिर्भरता'' हासिल की जा सके और 'मेक इन इंडिया' को सक्षम बनाया जा सके।

मंत्रालय ने सितंबर 2020 में एक बयान में कहा था कि डीएपी 2020 को सरकार के 'आत्मनिर्भर भारत' के दृष्टिकोण और 'मेक इन इंडिया' पहल के माध्यम से भारतीय घरेलू उद्योग को सशक्त बनाने के साथ जोड़ा गया है, जिसका ''अंतिम उद्देश्य भारत को वैश्विक विनिर्माण केंद्र में तब्दील करना'' है।

इसने गुरुवार को कहा कि 2025 को 'सुधारों का वर्ष' घोषित करने के बाद मंत्रालय ने डीएपी 2020 की ''व्यापक समीक्षा'' शुरू की है ताकि इसे ''भारत सरकार की मौजूदा नीतियों और पहलों के साथ संरेखित किया जा सके''।

मंत्रालय ने कहा, ''सभी हितधारकों के साथ व्यापक विचार-विमर्श करने के लिए महानिदेशक (खरीद) की अध्यक्षता में एक समिति गठित की गई है। समिति में रक्षा मंत्रालय के वरिष्ठ अधिकारी, रक्षा उद्योग और शिक्षा जगत के प्रतिनिधि शामिल हैं।'' इसने पूर्व नौकरशाह अपूर्व चंद्रा (1980 बैच) को ''समिति का प्रधान सलाहकार'' नियुक्त किया है, जो पूर्व में महानिदेशक (खरीद) के रूप में कार्य कर चुके हैं।

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IAF's work cut out

Source: The Tribune, Dt. 20 Jun 2025

China's J-35 offer to Pak sums up the challenge

INDIA admirably showcased its air power during Operation Sindoor. It was the Indian Air Force's (IAF) superiority in the skies — both in terms of offensive and defensive capabilities — that overwhelmed Pakistan. However, amid the jubilation, IAF chief Air Chief Marshal AP Singh laid bare a sobering reality: delays in the procurement of critical military platforms. He went to the extent of saying that "no single project that he can think of" had been completed on time. Such sluggishness and inefficiency won't serve India's grand goal of indigenously developing and producing the fifth-generation fighter jet — the Advanced Medium Combat Aircraft (AMCA).

A timeline of eight years has been set for this aircraft to be in a flying condition and ready for mass production. As per realistic estimates, it might take a decade to eventually roll out the AMCA. That's a long way off, and in the meantime, it's important not to lose sight of the short-term targets. The delayed delivery of 83 Light Combat Aircraft Tejas Mk1A from Hindustan Aeronautics Limited (HAL), the contract for which was signed in 2021, is worrisome. The silver lining is the increased supply of the F404 engine from General Electric Aerospace, thanks to which HAL is hopeful of delivering 12 Tejas Mk1A in the ongoing financial year.

The challenge is to fast-track projects without compromising on due diligence. There is no time to lose as China is bent on arming Pakistan with a slew of new weapons to wage future wars against India. Islamabad's June 6 tweet, claiming that Beijing has offered 40 fifth-generation J-35 fighters, KJ-500 airborne early warning aircraft and HQ-19 ballistic missile defence systems, is clearly aimed at making New Delhi uneasy. The J-35's USP is its enhanced stealth prowess for penetrating an adversary's airspace. It's obvious that a desperate Pakistan will push its all-weather ally to provide these fighters sooner than later. This should be reason enough for Indian defence firms, both in the public and private sectors, to rise to the occasion.

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रक्षा निर्यात के क्षेत्र में भारत मजबूत ग्लोबल लीडर के रूप में उभरा

Source: Dainik Jagran, Dt. 20 Jun 2025

विगत 11 वर्षों में भारत रक्षा निर्यात के क्षेत्र में एक मजबूत ग्लोबल लीडर के रूप में उभरा है क्योंकि इसमें कई गुना वृद्धि देखी गई है। वित्त वर्ष 2024–25 में 23,622 करोड़ रुपये का रक्षा निर्यात दर्ज किया गया, जबकि 2013–14 में यह सिर्फ 686 करोड़ रुपये था। साथ ही, देश ने अपने रक्षा क्षेत्र को स्वदेशी बनाने में भी महत्वपूर्ण प्रगति की है। इसने वित्त वर्ष 2023–24 में अपना अब तक का सबसे अधिक रक्षा उत्पादन हासिल किया, जिसका कुल मूल्य 1,27,434 करोड़ रुपये है। यह 2014–15 के 46,429 करोड़ रुपये की तुलना में 174 प्रतिशत अधिक है।

सरकार के एक आधिकारिक बयान के अनुसार, लाइट काम्बैट एयरक्राफ्ट तेजस, अर्जुन टैंक, आकाश मिसाइल सिस्टम, एएलएच ध्रुव हेलीकाप्टर और कई नौसैनिक जहाजों जैसे स्वदेशी उत्पादों ने इस सफलता में योगदान दिया है। यह वृद्धि केंद्रित नीतियों और आत्मनिर्भरता के लिए मजबूत प्रयास से प्रेरित है। वित्त वर्ष 2024–25 में भारत ने 23,622 करोड़ रुपये का रक्षा निर्यात दर्ज किया, जो वित्त वर्ष 2013–14 में 686 करोड़ रुपये था।

निजी क्षेत्र ने 15,233 करोड़ रुपये का योगदान दिया, जबकि रक्षा सार्वजनिक क्षेत्र उपक्रम ने 8,389 करोड़ रुपये का योगदान दिया, जो पिछले वर्ष की तुलना में 42.85 प्रतिशत अधिक है। उसी वर्ष 1,700 से अधिक उत्पादों के निर्यात को मंजूरी प्रदान की गई। भारत अब बुलेटप्रूफ जैकेट, हेलीकॉप्टर, टॉरपीडो और गश्ती नौकाओं जैसे विविध उत्पादों का निर्यात करता है। 2023–24 में अमेरिका, फ्रांस और आर्मेनिया शीर्ष खरीदार थे। 2029 तक निर्यात में 50,000 करोड़ रुपये तक पहुंचने के लक्ष्य के साथ भारत खुद को रक्षा विनिर्माण के एक वैश्विक केंद्र के रूप में मजबूती से स्थापित कर रहा है।

सरकार ने पांच सकारात्मक स्वदेशीकरण सूचियां (पीआइएल) जारी की हैं जो आयात को सीमित करती हैं और स्थानीय विनिर्माण को प्रोत्साहित करती हैं। इन सूचियों के अंतर्गत 5,500 से अधिक वस्तुएं शामिल हैं, जिनमें से 3,000 का फरवरी, 2025 तक स्वदेशीकरण कर दिया गया है। सूचियों में बुनियादी से लेकर उन्नत उत्पाद जैसे रडार, राकेट, तोपखाने और हल्के हेलीकाप्टर शामिल हैं।

इस प्रयास ने यह सुनिश्चित किया है कि अब देश के भीतर ही महत्वपूर्ण क्षमताएं निर्मित की जा रही हैं। उत्तर प्रदेश और तमिलनाडु में दो रक्षा औद्योगिक गलियारे स्थापित किए गए हैं। इन गलियारों ने 8,658 करोड़ रुपये से अधिक का निवेश आकर्षित किया है और 253 समझौता ज्ञापनों (एमओयू) पर हस्ताक्षर किए हैं जिनकी अनुमानित निवेश क्षमता फरवरी, 2025 तक 53,439 करोड़ रुपये है। दोनों राज्यों में फैले ये केंद्र भारत को रक्षा विनिर्माण महाशक्ति बनने के लिए आवश्यक बुनियादी ढांचा और सुविधाएं प्रदान कर रहे हैं।

रक्षा मंत्रालय ने 2024–25 में 2,09,050 करोड़ रुपये के 193 अनुबंधों पर भी हस्ताक्षर किए जो किसी एक वर्ष में अब तक का सबसे अधिक है। इनमें से 177 अनुबंध घरेलू उद्योग को दिए गए, जिनकी राशि 1,68,922 करोड़ रुपये है। यह भारतीय निर्माताओं को प्राथमिकता देने और देश के भीतर रक्षा पारिस्थितिकी तंत्र को मजबूत करने की दिशा में एक स्पष्ट बदलाव दर्शाता है। स्वदेशी खरीद पर ध्यान केंद्रित करने से रोजगार सृजन और तकनीकी उन्नति को भी बढ़ावा मिला है।

https://www.jagran.com/business/biz-india-emerges-as-a-strong-global-leader-in-defence-exports-23968364.html

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Why India should address its propulsion gap

Source: The Hindu, Dt. 20 Jun 2025

There has been growing excitement in military and industrial circles over the fast-tracked indigenous fifth generation stealth Advanced Medium Combat Aircraft (AMCA). Touted as a multi-

role fighter with super-cruise capability, internal weapons bays, advanced avionics, and diverter-less supersonic intakes enhancing stealth and reliability, the AMCA is being hailed as a milestone in Indian aerospace history. However, a dose of historical realism is warranted particularly since India has a persistent propulsion gap, and is overly reliant on imported engines. Nearly seven decades of fighter development reveal cautionary lessons, starting with India's first indigenously designed fighter jet, the HF-24 Marut (Spirit of the Tempest).

What happened to the HF-24 Marut?

Launched in the 1950s by Hindustan Aeronautics Limited (HAL) under famed German engineer Kurt Tank — designer of several WWII Luftwaffe fighters — the twin-engine, swept-wing Marut was, like the AMCA, an ambitious project of its time. Sleek and capable of transonic speeds, it embodied post-colonial India's drive for self-reliance and entered service amid high hopes in the late 1960s.

However, the Marut never reached its full potential, not because of design flaws, but entirely due to its underpowered British Bristol Siddeley Orpheus 703 turbojets. Although Tank had envisioned a more powerful engine, it never materialised, leaving the Marut's performance underwhelming. And, while it performed reasonably well in ground-attack roles during the 1971 war on the western front, its propulsion limitations ultimately proved crippling. HAL produced only 147 of these high-maintenance, low-output fighters, which were eventually 'number-plated' or retired by 1990.

Indian Air Force (IAF) veterans who flew the Marut consistently cited the lack of a powerful engine as its Achilles' heel — highlighting the enduring reality that high-end fighters live or die by propulsion technology. Engines, after all, are not mere technical parts but the core of sovereign aerospace capability, shaping a combat aircraft's power, range, and mission effectiveness.

Did India develop its own engines?

Following the Marut's disappointing engine performance, the Defence Research and Development Organisation (DRDO) assigned its Gas Turbine Research Establishment (GTRE) laboratory in 1989 to develop the Kaveri GTX-35VS afterburning turbofan for the Light Combat Aircraft (LCA), which had been under design development since 1981-82.

Over the next 35 years, GTRE spent around ₹2032 crore, as of 2020, on the project, but without success. Despite producing nine full-scale prototypes and four core engines — logging over 3,000 hours of ground testing and 73 hours of flight trials on an Ilyushin IL-76 flying test bed in Russia — the Kaveri failed to meet the LCA's performance benchmarks. It struggled with thrust-to-weight ratio, reliability, and thermal management under sustained high-performance conditions. Though spinoff versions were proposed for tanks, ships, and locomotives, none have so far entered operational use.

A revival attempt in 2016, in collaboration with French engine-maker Snecma (linked to offset obligations from the IAF's Rafale deal) also collapsed. A parallel proposal by its partner Safran to co-develop a new engine for the Tejas MkII and AMCA met a similar fate, reportedly rejected by the DRDO due to institutional pride.

Meanwhile, Kaveri's failure forced the Aeronautical Development Agency (ADA), responsible for the LCA's design, to adopt the U.S.-made General Electric (GE) F404-IN20 afterburning turbofan engine (producing 78-80 kN of thrust) around 2004. Although barely adequate — restricting Tejas' payload and high-angle-of-attack capabilities — the engine was eventually approved by the IAF,

which inducted two Mk1 squadrons from 2015 onwards, with one squadron operating without full operational clearance, nearly 34 years after the LCA programme's inception.

How is India affected by engine dependency?

India's engine dependency issues resurfaced recently when GE delayed delivery of 99 F404 engines by 13 months for the upgraded LCA Mk1A — a lighter, more capable variant equipped with an Active Electronically Scanned Array (AESA) radar, advanced electronic warfare suites, and mid-air refuelling capability. Under a $716 million contract signed in 2021, engine deliveries were scheduled to begin by March 2024, but the first power pack arrived only in April 2025, as part of an initial batch of 12 expected by the end of the year. GE cited "unprecedented supply chain pressures," including disruptions from suppliers, as the cause for the delay, but for India it jeopardised the MK1As commissioning by deferring it further.

This triggered sharp criticism from Air Chief Marshal A.P. Singh, who publicly rebuked HAL for chronic slippages in fighter deliveries amid a steep decline in IAF combat strength from a sanctioned 42.5 fighter squadrons to around 30 presently. Further reductions loom with two legacy MiG-21 'Bis' squadrons slated for imminent retirement. "We need to be now ready to be future-ready," Mr. Singh said at the CII Annual Business Summit in New Delhi on May 29. Citing HAL's blotted history of missed deadlines, he bluntly asserted that wars are won by equipping the military, not merely planning for the future.

Simultaneously, HAL's negotiations with GE to locally manufacture the more powerful GE-F414 engine (90–96 kN thrust) — intended for the LCA Mk2 and initially the AMCA Mk1 — too has hit a roadblock. The deal, announced during Prime Minister Narendra Modi's 2023 U.S. visit, has reportedly been stalled by GE's demand for an additional $500 million over the original $1.5 billion agreement.

More critically, GE appears unwilling to share core engine technologies like single-crystal turbine blades, thermal barrier coatings, and advanced cooling systems, all of which are vital for boosting engine durability and thrust. HAL continues to demand full technology transfer, but industry insiders point out that such proprietary know-how, developed at great expense, is rarely shared by global engine makers. Talks, however, are still ongoing.

Both the LCA Mk2, which is under-development, and the initial AMCA Mk1 models are expected to rely on the F414 as a 'stopgap' powerplant, pending finalisation of the deal. The ADA is also scouting for a 110 kN-class engine for the AMCA Mk2, potentially via a joint venture. Intermittent discussions with France's Safran and the U.K.'s Rolls-Royce have so far yielded no concrete outcome.

And, while these possibilities may serve as a short-term workaround, it reflects the same external engine dependence that had crippled the Marut. Consequently, a cross-section of IAF veterans and aerospace experts warned that unless India developed an indigenous engine to power future AMCA blocks, the programme risks being held hostage once again to geopolitical whims.

How much is India dependent on external engines?

India's external propulsion sourcing extends well beyond aerial platforms, affecting the Army and Navy as well, both of which are exclusively reliant on imported power packs or foreign engines assembled and built domestically under licence. The Army's Arjun Main Battle Tank, for example, is powered by the German MTU MB838 Ka-501 diesel engine paired with RENK RK-304 transmissions, while the recently trialled Zorawar Light Tank uses the U.S.-origin 1,000hp

Cummins Advanced Combat Engine. The Navy too depends wholly on foreign propulsion systems — Russian, Ukrainian, French, German, and U.S. engines — that power all its indigenously designed and built frigates, destroyers, auxiliary vessels, troop carriers, corvettes, and fast attack craft. India's all-round engine development across aerospace, land, and naval platforms is critical to ensure strategic autonomy and enhance military capability.

How important is autonomous engine development ?

Aircraft engine development is vital for India to achieve aerospace autonomy and strategic self-reliance. Disruptions in foreign engine supplies delay production like that of the LCA Mk1A, hampers upgrades, and restricts exports as that would necessitate third-party approvals. The U.S., France, and China are able to assert dominance in global aerospace markets as they have harnessed indigenous propulsion.

However, for India, mastering advanced jet engine technology is not merely a prestige project but is crucial to sustaining military readiness, ensuring credible deterrence, and insulating its defence sector from external shocks and global political vagaries. Without this core capability, India's broader ambitions in aviation and defence exports risk remaining perennially compromised.

A broad spectrum of defence experts and IAF veterans contend that India's failure to develop advanced jet engines transcend technical hurdles and are fundamentally a political challenge. India's defence funding remains fragmented, largely focused on short-term projects, rather than being driven by a long-term, strategic vision.

If India is genuinely committed to closing this glaring capability gap, mere slogans like Atmanirbhar Bharat will not suffice. Achieving true autonomy in engine technology demands comprehensive structural reforms, unwavering political will, and the cultivation of an innovation ecosystem which will seamlessly integrate private sector participation, academic research, and defence R&D institutions into a cohesive and competitive framework.

https://www.thehindu.com/news/national/why-india-should-address-its-propulsion-gap/article69714631.ece

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Science & Technology News

Indian Institute of Astrophysics (IIA), Bengaluru scientists discover a new kind of Stellar Chemistry

Source: Press Information Bureau, Dt. 19 Jun 2025

Far away in the Ophiuchus Constellation, a peculiar star named A980, 25800 light years away, is rewriting what we know about stellar chemistry. Researchers have uncovered a cosmic twist -- this mysterious star that belongs to a rare class called Extreme Helium (EHe) stars, carries surprisingly high amount of germanium—a metallic element never before observed in this type of star.

A980 was initially thought to be a hydrogen-deficient carbon star, a peculiar breed of cool star that lacks hydrogen—the most common element in the universe.

A closer look by astronomers from the Indian Institute of Astrophysics (IIA), an autonomous institute of the Department of Science and Technology (DST) using the Hanle Echelle Spectrograph on the Himalayan Chandra Telescope in Ladakh, showed something strange. Its spectrum—essentially a stellar fingerprint—did not match what they expected.

Instead, the pattern looked a lot like that of another rare type of star, LS IV -14° 109, a known cool EHe star. These stars are so rare that only a handful have been identified. What makes them special is that they are almost entirely made of helium, and they are likely formed when two white dwarf stars—one carbon-oxygen rich and the other helium-rich—merged in a spectacular cosmic collision.

The team also spotted something no one had ever seen before in an EHe star -- singly-ionized germanium (Ge II) lines. This means that germanium atoms in the star had lost one electron, leaving a distinct trace in the star's spectrum.

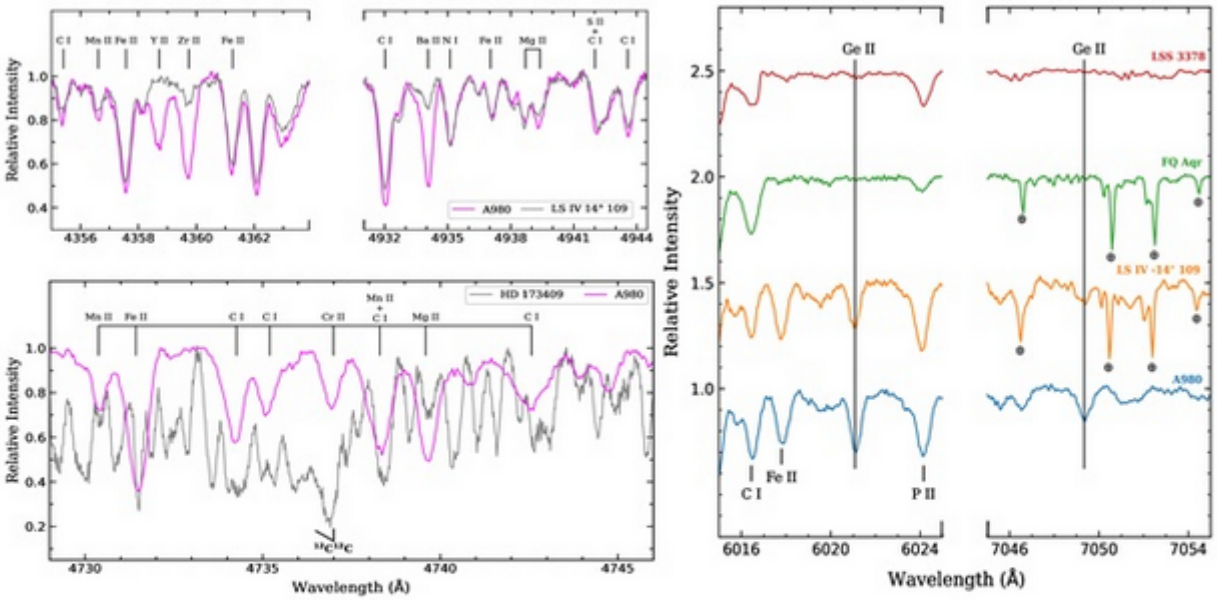

Fig: *The observed spectra of LS IV -14° 109, a known cool EHe, and A980 are displayed for comparison in the top left panel. In the bottom left panel, the observed spectra of HD 173409, a known HdC, and A980 are shown in the (1, 0) C_2 band region for comparison. In the right panel, the Ge II λ6021.04 and λ7049.37 Å lines in A980, along with those in other cool EHes such as LS IV -14° 109, FQ Aqr, and LSS 3378, are highlighted with vertical lines.*

"We were surprised to see singly-ionized germanium (Ge II) lines in the A980's optical spectrum. These are the first-ever detections of germanium lines in an EHe's observed spectrum, and provide the first measurements of germanium abundance in an EHe star," said Gajendra Pandey, the co-author of the study and thesis supervisor of his Ph. D student, Ajay Saini.

They found that germanium is eight times more abundant in A980 than in the Sun, which is evidence for the synthesis of germanium in EHe stars. Also, A980 showed a maximum enhancement of the s-process elements based on a significant number of spectral line transitions among the known cool EHe stars.

“Germanium has never been detected in these stars before, and here it was—eight times more abundant than in our own Sun! said Ajay Saini, who led the study.

EHe stars are thought to originate from the merger of a carbon-oxygen white dwarf with a less massive helium white dwarf. The detection of germanium offers new clues for exploring other plausible scenarios”, he explained.

This incredible find suggests that A980's past includes some heavy-duty cosmic chemistry, likely involving a process where atomic nuclei slowly capture neutrons—the s-process, a known method of forging elements which are heavier than iron.

The researchers suspect that A980’s unusual chemistry could trace back to a phase in stellar evolution called the Asymptotic Giant Branch (AGB)—a stage when stars puff up and start producing heavy elements like barium, strontium, and germanium. These stars eventually shed their outer layers, and their cores become white dwarfs.

The study proposes that A980 could be the result of a merger between a helium white dwarf and a carbon-oxygen white dwarf—an event dramatic enough to stir up and distribute these rare elements.

But there's another possibility. Thorne-Żytkow Objects (TŻOs)—theoretical hybrid stars that have a neutron star at their core—are also known to produce lots of germanium, using a different method called the rp-process (rapid proton capture). While A980 does not fully match the expected properties of a TŻO, the similarities are intriguing.

Heavy elements like germanium are forged in the crucibles of dying stars, and every new clue helps astronomers’ piece together the cosmic story of how matter came to be. By identifying germanium in A980, scientists now have a new puzzle to solve—one that might deepen our understanding of how rare stars evolve and what happens when white dwarfs collide.

“This discovery pushes the boundaries of what we thought we knew about stellar chemistry,” said Dr. Gajendra Pandey, the study’s co-author. “It also shows how powerful high-resolution spectroscopy can be used in uncovering the hidden stories written in starlight.” The research has been published in *The Astrophysical Journal* and marks a major milestone for the Indian Institute of Astrophysics—illuminating not just a single star, but a whole new frontier of stellar evolution.

https://www.pib.gov.in/PressReleasePage.aspx?PRID=2137715

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"The hidden healers in poisonous plants”, A Research Study by IASST, Guwahati

Source: Press Information Bureau, Dt. 19 Jun 2025

In the corridors of Assam’s lush biodiversity, scientists have unravelled a paradoxical truth-- some of nature’s most poisonous plants are also among its most powerful healers. This finding could change the future of medicine. Plants have been used for their medicinal value since ancient times. While some plants are known for their toxicity, they also contain beneficial phytochemicals important for both plants and humans, indicating their dual nature. Despite being notorious for toxicity, they possess extraordinary compounds that can be converted into powerful weapons for healing when meticulously isolated and altered.

With the advancement of research and development in this domain, the therapeutic potential of phytochemicals derived from toxic plants has surfaced as a promising direction for contemporary medicine, setting the stage for future research and medical progress.

Researchers at the Institute of Advanced Study in Science and Technology (IASST), Guwahati, an autonomous institute of the Department of Science and Technology (DST) tracing the secrets held in the leaves, roots, and sap of the natural world, have comprehensively investigated various poisonous plant species and their phytochemical constituents.

A research team led by Prof. Ashis K. Mukherjee, Director of IASST and Bhagya Lakhmi Rajbongshi, Senior Research Fellow, has reviewed existing literature and identified 70 poisonous plant species which are used traditionally to treat a wide array of illnesses—from fevers and colds to skin diseases and oedema. These plants are already utilized in homeopathy and traditional Indian medicine.

The researchers emphasized that plants produce phytochemicals—natural compounds used for their own survival, which can also affect human biology. While some of these are toxic, others—when isolated and modified—hold immense medicinal promise.

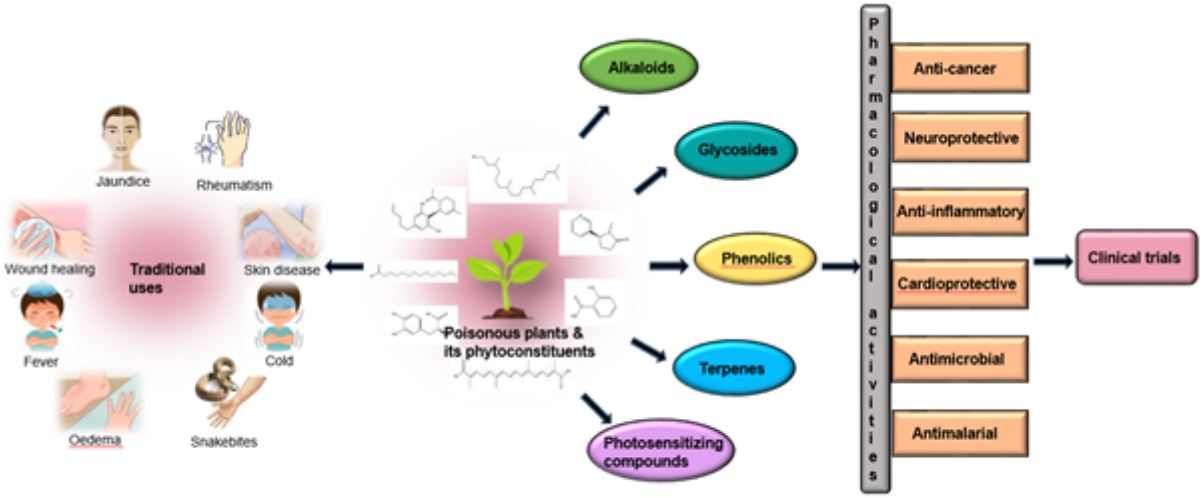

Fig: *Graphical representation of the toxic plants & phytochemical constituents*

Modern pharmacology is beginning to recognize the potential of these phytochemicals. These toxic compounds can be transformed into potent therapeutic agents with careful scientific processing. The study, published in Toxicon: X (Elsevier), explores how these natural toxins can be studied, validated, and potentially turned into life-saving drugs.

The findings draw upon ethnopharmacology—how indigenous cultures use plants for healing. From treating snakebites to managing jaundice, these traditional remedies are now being re-evaluated through the lens of modern science. The implications are vast. With rigorous testing, these plants could help discover novel drugs for diseases still lacking effective treatment.

The researchers have stressed the importance of rigorous scientific validation before clinical use. Toxicity must be carefully studied to ensure safety. The journey from folk remedy to FDA-approved medicine is long, but with studies like this, the first steps are being taken.

https://www.pib.gov.in/PressReleasePage.aspx?PRID=2137709

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