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What is India's military strength?

India seems to be modernising its military and its nuclear capabilities keeping an eye on China. India's declared policy is of nuclear deterrence and no first strike. However, the modernisation program, particularly the ballistic missiles program, shows that India is intent on bringing the whole of China in its strike range.

India's military prowess is growing every year. It continues to face threats on both the eastern and western fronts from Pakistan, China, internally through militancy, Maoists and terrorist outfits. At such a time, India prepares for the most adverse situations and is in the process of a large military modernisation and overhaul. India has been fast developing new military technology, acquiring what is required, manufacturing weapons, aircraft, naval vessels etc to make India's military a strong force to handle these threats. India's nuclear weapons and ballistic missiles program has also caused concerns for India's adversaries. Adding to this, the increased pace of acquisitions and commissioning of defence equipment shows that India is wary of the threats and wants to upgrade and bolster the military as much as possible.

India seems to be modernising its military and its nuclear capabilities keeping an eye on China. India's declared policy is of nuclear deterrence and no first strike. However, the modernisation program, particularly the ballistic missiles program, shows that India is intent on bringing the whole of China in its strike range.

So what is India's current military strength? We take a look:

According to Globalfirepower, the Indian military has a combined 4,207,250 active and reserve personnel in service. Since resources like aircraft, personnel, helicopters etc are spread across the three services – Army, Air Force and Navy – we take a look at air power, ground strength and naval power. We also take a look at India's nuclear capabilities.

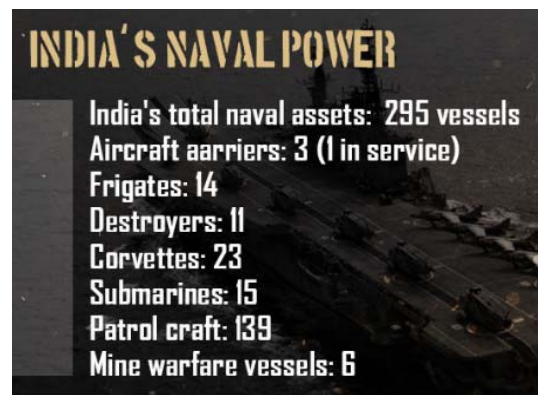


Air power

Air power is crucial in times of war, conflict, for reconnaissance, surveillance, rescue, special ops etc. The Indian military has attack aircraft, fighter aircraft, bombers, reconnaissance aircraft, transporters, attack helicopters, air superiority fighters etc. Some aircraft can serve multiple roles like the commissioned Rafale are multi-role combat aircraft.

India's Naval prowess:

The Indian Navy is the fifth largest navy in the world. It has in its fleet tactical submarines, nuclear-powered submarines, conventionally powered submarines, aircraft carrier, destroyers, frigates, amphibious warfare ships, corvettes etc. The Navy played a crucial role in India's victory in the 1971 war with Pakistan and also plays a key role in securing India and its interests in Indian Ocean, Arabian Sea, Bay of Bengal, South China Sea etc.



INDIAN ARMY'S STRENGTH

Total active personnel: 1,200,255
Combat tanks: 4,426
Armored fighting vehicles: 6,704
Self-propelled artillery: 290
Towed artillery: 7,414
Rocket projectors: 29

Indian Army's strength:

The Indian Army is arguably the backbone of the Indian armed forces. The footsoldiers who guard India's borders and deal with the security threats to the country in the most testing situations have made the Indian Army one of the most versatile forces in the world. The Army's soldiers are divided into 35 Divisions within 13 Corps. The Indian Army is the third strongest in the world, according to Globalfirepower on the basis of strength of personnel. China and the US are considered to be number 1 and 2.

India's Nuclear missile capability

According to Arms Control Association, India's nuclear stockpile has 130 warheads. ACA data from July 2017 shows India's nuclear stockpile as the seventh largest in the world. India has a variety of launch systems that can deliver nuclear warheads for example missiles launched from land or from naval vessels and even submarines.'

INDIA'S NUCLEAR CAPABILITY

India's nuclear weapons: 130
Minimum tactical missile range: 150 km
Farthest strike distance tested successfully :
5,000-8,000 km (Agni-V)
Surya missiles (ICBMs):
Range upto 16,000 km under development.

MAIL TODAY

Sun, 16 July, 2017

Navy wants jets to toughen up

The Indian Navy's only fighter aircraft MiG-29K continues to face problems as the maritime force feels that the fighter jet needs to be further ruggedised for carrying out operations from aircraft carriers which is supposed to be its main role. "The plane needs to be ruggedised further as very frequently after landings, the settings of the plane change and they have to be re-set," sources in the Navy told MAIL TODAY.

The Navy operates the MiG- 29Ks from its Goa air base as well as the aircraft carrier INS Vikramaditya and after the phasing out of the Sea Harrier planes, it is not the only fighter aircraft left with the Navy. The Indian side has taken up the matter with the Russians who, have already sent their technical teams to look into the problems and find a solution for it, as the aircraft are still in warranty period.

"The issue has been taken up with the Russians at the senior level as India and Russia discuss their military ties and issues at multiple forums including the level of the heads of states," the source said. Naval fighter aircraft need to be very tough as they virtually crash on the aircraft carrier's deck and have to maintain high speeds to be ready to take off in case they fail to hook to the arrester wire on the warship.

The fighter plane, which is operated only by India has faced operational deficiencies for a long time due to defects in engines, airframe and fly-by-wire system leading to very low availability for operations as this was pointed out by the Comptroller and Auditor General (GAG) in its report last year.

"The MiG-29K, which is a carrier-borne multi-role aircraft and the mainstay of integral fleet air defence, is riddled with problems relating to airframe, RD MK-33 engine and fly-bywire system," the CAG said. Serviceability of the warplanes was low, ranging from 15.93 per cent to 37.63 per cent and that of MiG-29KUB ranging from 21.30 per cent to 47.14 per cent. Serviceability refers to the total number aircraft available for operation at a time from the overall capacity.

The auditor had also noted that the service life of the aircraft is 6000 hours or 25 years (whichever is earlier) and with issues facing the MiG-29K/KUB, the operational life of the aircraft already delivered would be

reduced. India ordered 45 MiG-29K aircraft and equipment worth `10,000 crore in two separate orders — in 2004 and 2010 — from Russia. It is the primary combat platform on INS Viramaditya — country’s only operational aircraft carrier inducted in 2014. The MiG-29K aircraft are also expected to serve on the homemade aircraft carrier INS Vikrant, which is still under construction and not expected to be inducted into service before the year 2023.

THE TIMES OF INDIA

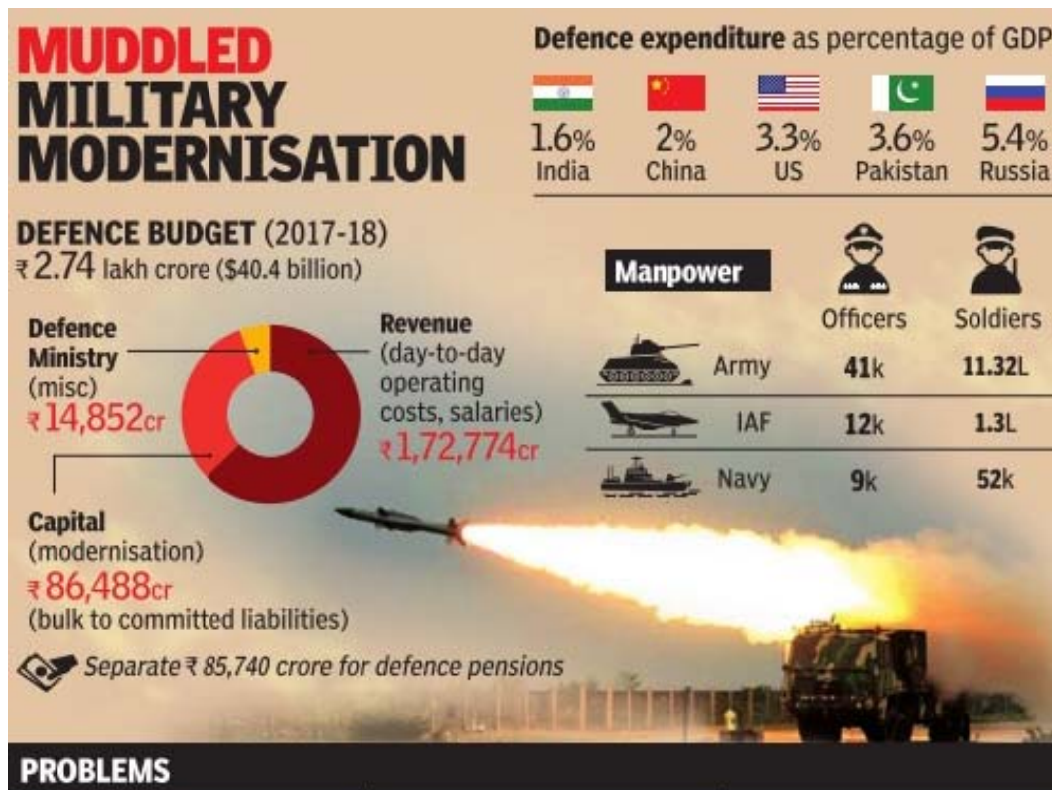
Sun, 16 July, 2017

Forces seek Rs 27 lakh cr over next 5 years for def projects

By Rajat Pandit

High Projection Comes Amid Face-Offs With China, Pakistan

The armed forces have sought an allocation of Rs 26.84 lakh crore (\$416 billion) over the next five years to ensure requisite military modernisation and maintenance to take on the collusive threat from Pakistan and China as well as to safeguard India's expanding geostrategic interests.



Union defence ministry sources said the 13th consolidated defence five-year plan for 2017-2022, which has been pegged at Rs 26,83,924 crore after extensive consultations with all stakeholders, including the DRDO, was presented at the Unified Commanders' Conference here on July 10-11.

“The armed forces pitched for an early approval to the 13th Plan because their annual acquisition plans are based on it,” said a source. These projections for higher defence outlays

come at a time when Indian and Chinese troops are locked in a tense but “non-aggressive“ face-off near the Sikkim-Bhutan-Tibet tri-junction, while the daily firing duels with Pakistan along the line of control continue to take a toll on both sides. Union defence minister Arun Jaitley , who addressed the conference, assured the armed forces that capital expenditure for modernisation projects will be “a priority area“ with resource availability increasing within the Indian economy . But it is also true that the actual annual defence budgets have shown a discernible trend of declining modernisation budgets, unspent funds and a skewed revenue to

capital expenditure ratio, which have meant that the Army, Navy and IAF continue to grapple with critical operational gaps on several fronts.

In the 2017-18 defence budget, for instance, the Rs 1,72,774 crore revenue outlay by far outstrips the capital one of Rs 86,488 crore for new weapon systems and modernisation. Moreover, the Rs 2.74 lakh crore defence budget works out to just 1.56% of the projected GDP, the lowest such figure since the 1962 war with China. “The forces want the defence budget to progressively reach at least 2% of the GDP for their operational requirements,” said a source.

As per the 13th Defence Plan, Rs 12,88,654 crore has been projected for the capital outlay, while Rs 13,95,271 crore for revenue expenditure. With an eye firmly on China, there is also a separate section in the plan on the “capability development” of the strategically-located triService Andaman and Nicobar Command, which was set up in October 2001 but has suffered from relative neglect, lack of infrastructure and turf-wars.

“The armed forces will concurrently work to improve their poor teeth-to-tail ratio as well as ensure proper inter-service prioritisation in procurements, thrust on indigenisation, and optimal utilisation of funds. They also want a concerted effort to prevent the yearly surrender of funds,” said another source.

The defence five-year plans are formulated in consonance with existing threat perceptions, the “Raksha Mantri's operational directives” and the 15-year LTIPP (long-term integrated perspective plan). But they have not received much attention from successive governments, with the 10th (2002-07), 11th (2007-12) and 12th (2012-17) Plans failing to get approval from the finance ministry.



Sun, 16 July, 2017

US House for enhanced defence ties with India

The US annual defence budget of about USD 621.5 billion for the 2018 fiscal has been passed by the House of Representatives and among other things it seeks advancing of military cooperation with India, already a major defence partner of America.

An amendment on enhancing cooperation with India was moved by Indian-American Congressman Ami Bera and was adopted by a voice vote by the House as part of the National Defense Authorisation Act (NDAA) 2018, beginning October 1 this year. The NDAA-2018 was passed by the House 344-81.

The India-related amendment passed by the House requires the secretary of defence, in consultation with the secretary of state, to develop a strategy for advancing defence cooperation between the US and India. “Cooperation between US and India enhances our own defence and our ability to meet the evolving security challenges of the 21st century,” Bera said.

Following the passage of the National Defence Authorisation Act, the secretary of defence and secretary of state have 180 days to develop a strategy for advancing defence cooperation between the United States and India. NDAA needs to be passed by the Senate before it can be sent to the White House for the US President Donald Trump to sign into law.

As passed by the House, NDAA-2018 asks the state department and the Pentagon to develop a strategy that addresses common security challenges, the role of American partners and allies in the India-US defence relationship, and the role of the defence technology and trade initiatives. It also asks them to address how to advance the communications interoperability and security memorandum of agreement and the basic exchange and cooperation agreement for geospatial cooperation.

Nuclear war could trigger climate change

A Ocean in 1952. S TENSIONS build around the world, many countries have begun beefing up their defence capabilities to prepare for a nuclear threat. But, experts warn the repercussions of a blast won't just be limited to the site of a nuclear strike — instead, such an event could cause global devastation. A new report found that warheads of magnitudes already owned by several major nuclear powers could trigger climate change as the resulting black ash causes temperatures to drop, leading to drought, famine, and billions of deaths.

The researchers from the University of Nebraska-Lincoln investigated 19 types of weapons currently held by five major nuclear powers: the US, Russia, China, the United Kingdom, and France. According to the report, it would take just a handful of these bombs to bring on disastrous effects worldwide. “We’re losing our memory of the Cold War and we’re losing our memory of how important it is to get this right,” said co-author Tyler White, a political scientist who specialises in international security and nuclear policy.

“Even a conflict that doesn’t involve the United States can impact us and people around the world.” With just three 1.2-megaton (MT) bombs, or two Trident D5 SLBM (each with four 475-KT warheads), the US could bring on a nuclear-drought, it warns. Only four 800-KT Russian ICBMs or ten 300-KT French gravity bombs would be needed to cause similar climatic effects.

And, China could bring on the phenomenon with just one 5-MT land-based missile, which would burn an area “similar in size to that of one hundred 15-KT explosions.” “Thus, use of as few as 1 to 10 deployed nuclear weapons, and fewer than 25 of these prevalent types, from the five official nuclear weapons countries could produce a nuclear drought,” the researchers warned in the new report. While the effects wouldn’t be as dramatic as those predicted in a ‘nuclear winter’ scenario, the resulting drought — also known as nuclear autumn — could have significant impacts around the world, they say.

“The question is not if a nuclear drought can occur, but what factors increase its probability of occurring and what actions can be taken to mitigate the potentially devastating global impacts,” said Adam Liska, a biological systems engineer at Nebraska. Previous research determined that a blast capable of igniting an area of about 1,300 square kilometres (500 square miles), would pump over 5 million tons of ash into the stratosphere.

And, this would block out sunlight, causing temperature and rainfall to drop. “If the ash reaches the stratosphere, many months could pass before it dissipates,” said Robert Oglesby, a professor of Earth and atmospheric sciences. The researchers say these high quantities of black carbon in the stratosphere would cause agricultural growing seasons to be reduced by 10-40 days each year for at least five years. Below average temperatures would persist for far longer, potentially remaining low for up to 25 years. And, immediately after the blast, temperatures could drop to levels colder than they’ve been in the last 1,000 years. The nuclear drought would cause a significant decrease in precipitation in the Asian monsoon region, by as much as 20-80 percent, and reductions in rainfall across South America and southern Africa, the American Southwest, and Western Australia could cause the regions to be 20-60 percent drier than usual.

“Climatic changes due to nuclear explosions on developed land could essentially produce a global ‘nuclear drought’, and the resulting famines could kill up to a billion people from starvation, which would probably most affect those communities that are already in foodinsecure environments in the developing world, particularly in sub-Saharan Africa, South Asia, and the Middle East,” the researchers wrote. “Significant changes in precipitation would probably also increase conflict in developing regions, although global temperature reductions may reduce social violence in the United States and Other developed countries.” The researchers note that the risk of widespread consequences kept the US and the Soviet Union in check during the Cold War.

At the time, each nation recognised that a nuclear attack from either side would cause ultimately mutual destruction. With the new analysis, the researchers say countries can make more informed decisions in light of recent threats from North Korea. “We pulled together what is known about nuclear weapons today, to make a case about the magnitude of these impacts,” Liska said. “With that understanding, we can make better choices going forward.”

THE ASIAN AGE

Sun, 16 July, 2017

Galaxy 10,000 light years far outshines Milky Way

The galaxy appears 11 times bigger than it really is.

London: Scientists have discovered a very distant galaxy, some 10 thousand million light years away, which is about 1,000 times brighter than the Milky Way. It is the brightest of the submillimetre galaxies, which have a very strong emission in the far infrared, researchers said.

Scientists led by Anastasio Diaz-Sanches from Polytechnic University of Cartagena (UPCT) in Spain used gravitational lensing that acts as a sort of magnifier, changing the size and intensity of the apparent image of the original object. “Thanks to the gravitational lens produced by a cluster of galaxies between ourselves and the source, which acts as if it was a telescope, the galaxy appears 11 times bigger and brighter than it really is, and appears as several images on an arc centred on the densest part of the cluster, which is known as an Einstein Ring,” said Diaz-Sanchez.

“The advantage of this kind of amplification is that it does not distort the spectral properties of the light, which can be studied for these very distant objects as if they were much nearer,” Diaz-Sanchez said.

To find this galaxy, a search of the whole sky was carried out, combining the data bases of the satellites WISE and Planck in order to identify the brightest submillimetre galaxies. The galaxy is notable for having a high rate of star formation.

It is forming stars at a rate of 1,000 solar masses per year, compared to the Milky Way which is forming stars at a rate of some twice a solar mass per year.

पंजाब केसरी

Sun, 16 July, 2017

कीचड़ से बनी है पृथ्वी, रहस्य आया सामने!

मेलबर्न: पूर्व के अध्ययन के उलट ऐसी संभावना है कि पृथ्वी जैसे ग्रहों की उत्पत्ति चट्टानी क्षुद्रग्रहों के तौर पर नहीं बल्कि गर्म कीचड़ से बने विशालकाय गोलों के तौर पर हुई। एक नए अध्ययन में यह जानकारी दी गई है।

वैज्ञानिक लंबे समय से कहते आए हैं कि पृथ्वी सहित ग्रहों का निर्माण चट्टानी क्षुद्रग्रहों से हुआ लेकिन नए शोध में इस मान्यता को चुनौती दी गई है। ऑस्ट्रेलिया के कर्टिन यूनिवर्सिटी के शोधकर्ताओं का कहना है कि हमारे सौरमंडल में कई मूल खगोलीय खंडों ने संभवतः असल में चट्टानी क्षुद्रग्रहों के रूप में जीवन की शुरुआत नहीं की बल्कि यह गर्म कीचड़ के बने विशालकाय गोले के तौर पर हुई।

विश्वविद्यालय के खगोलविज्ञानी फिल ब्लैंड ने मौजूदा ग्रहों के शुरुआती रूप छोटे ग्रहों के बारे में बेहतर जानकारी हासिल करने के लिए यह शोध किया था। विश्वविद्यालय के वरिष्ठ वैज्ञानिक ब्रायन ट्रेविस ने कहा, रेडियोसक्रिय

आइसोटोप के क्षय से निकली गर्मी से बर्फ पिघलने और उस पानी के धूल के महीण कणों में मिलने से कीचड़ का जन्म हुआ होगा। यह अध्ययन साइंस एडवांसेज पत्रिका में प्रकाशित हुआ है।

नवभारत टाइम्स

Sun, 16 July, 2017

नासा ने प्लूटो ग्रह का किया नया नक्शा जारी

वाशिंगटन: अमेरिकी अंतरिक्ष एजेंसी नासा ने प्लूटो तथा उसके सबसे बड़े उपग्रह चारोन का नया नक्शा जारी किया है। इस नक्शे से इनके बारे में काफी जानकारी मिल सकती है। नासा के न्यू होराइजन अंतरिक्ष यान ने 14 जुलाई, 2015 को प्लूटो के लिए ऐतिहासिक उड़ान भरी थी। अब वह प्लूटो तथा उसके सैटलाइट की तस्वीरें उपलब्ध कराने के साथ ही अन्य आंकड़े इकट्ठी कर रहा है, जिसने सौर मंडल की बाहरी सीमा पर इस रहस्यमय दुनिया के प्रति हमारी

समझ को बदलकर रख दिया है। वैज्ञानिक उन आंकड़ों का अभी भी विश्लेषण कर रहे हैं, जिन्हें न्यू होराइजंस ने भेजे हैं। अंतरिक्षयान फिलहाल पृथ्वी से 5.7 अरब किलोमीटर की दूरी पर है और अपने अगले लक्ष्य तक पहुंचने के लिए रहस्यमय क्विपर बेल्ट की गहराई में पहुंच गया है। साल 2019 के नववर्ष के दिन न्यू होराइजन क्विपर बेल्ट ऑब्जेक्ट को बेहद तेजी से पार करेगा, जिसका नाम 2014 एमयू 69 है। (आईएनएस)



Sun, 16 July, 2017

IISER Kolkata develops fire-retardant, rust-resistant material

By R. Prasad

The multipurpose hybrid material prevents E. coli growth and is hydrophobic

Now, paper or other materials coated with a hydrophobic (water hating) hybrid molecular material synthesised by researchers at the Indian Institute of Science Education and Research (IISER) Kolkata can behave like a lotus leaf and keep the surface clean and water-proof.

Besides increasing the mechanical strength of the coated paper 1.5 times, the molecular material can inhibit bacterial growth and even render the coated material such as paper or wood fire-proof. The results of the study were published in the journal *ACS Omega*.

The organic-inorganic hybrid material was synthesised by combining polyhedral oligomeric silsesquioxane (POSS) and diphenylalanine. The POSS molecule by itself has unique properties such as high thermal stability and fire retarding ability. While both POSS and diphenylalanine are naturally water repelling, the hydrophobic nature gets enhanced when they are combined.

“The contact angle of paper, which was 62 degree and therefore hydrophilic before coating, increased to 113 degree after coating and became hydrophobic,” says Krishnendu Maji from the Department of Chemical Sciences, IISER, Kolkata and the first author of the paper.

To demonstrate the effect of the hybrid material’s hydrophobic nature, the two-member team led by Prof. Debasish Halder from the Department of Chemical Sciences, IISER, Kolkata, folded an ordinary paper and a hybrid-coated paper and drenched the two pieces in water. While the paper without any coating could not be unfolded, the coated paper could be unfolded and regain its original shape.

Corrosion resistance

Testing the hydrophobic nature of the hybrid material and its ability to prevent corrosion, the researchers coated iron nails with the hybrid molecular material and exposed it to water. While the nails that were not coated rusted, those with the coating did not. Coating one half of the nail with the hybrid material, the team found the uncoated portion of the nail rusted in about 12 hours when treated with water; the coated portion remained rust-free. “The coated nails did not get rusted when treated with water for up to one month,” Mr. Maji says.

The coated nails were able to resist corrosion even when treated with an aqueous solution of sodium chloride, potassium chloride, sodium bromide and even hydrochloric acid.

The hybrid material is colourless and does not react with metal. The coated silver artefacts were able to resist the formation of black colour (silver sulphide) on its surface when treated with hydrogen sulphide for 10 minutes. “This hybrid material can protect artefacts from environmental pollution and corrosion,” says Prof Haldar, the corresponding author of the paper.

The coated paper was found to inhibit bacterial growth. While the researchers observed *E. coli* growing on the surface of paper that was not coated, the hybrid-coated paper was able to inhibit *E. coli* growth for 10 days. “We tested the anti-bacterial property for up to 30 days and found the hybrid-coated paper was able to resist *E. coli* growth,” Mr. Maji says

Fire-retardant property

Finally, the fire-retardant property of matchsticks coated with the hybrid material was tested. While matchstick with no coating burnt completely, those coated with only POSS took more time to reach the end of the matchstick. But matchsticks coated with the hybrid material were able to extinguish the flame as soon as fire reached the coated portion. “The peptide not only retards the flame but also extinguishes the fire,” they write.

“Plenty of accidents take place when people throw lighted matchsticks. By coating a portion of matchsticks with the hybrid material, such accidents can be prevented,” Mr. Maji says.



Sun, 16 July, 2017

Predatory journal clones of Current Science emerge

By R. Prasad

They approach authors in a predictable style

An online predatory journal which is a clone of the journal Current Science published by the Indian Academy of Sciences and Current Science Association, Bengaluru, has sprung up and is soliciting manuscripts from gullible researchers. “This journal has not published any issues” is what one gets to read on clicking the ‘current issue’ button on the predatory journal website.

A scroll in the original Current Science website warns readers of the predatory journal trying to dupe researchers. It says: “We have learned that an entity <http://www.currentscience.org> is operating from an IP address located in Turkey. It has copied content from the Current Science journal website and promotes itself as the publisher of Current Science .”

Another clone of Current Science can be found at <http://www.currentscience.co.in> and is operating from an IP address located in Ukraine. The front page of the cloned predatory journal website is nearly identical to the original. Even the links to all the articles take the readers to the original content. Only discerning readers can spot the differences. The URL of the original Current Science website is <http://www.currentscience.ac.in>.

“This is a typical predatory journal behaviour and is a fraud,” says the predatory journal alert put out by the publishers.

The original journal website warns its readers saying: “Emails originating from currentsciencejournals@gmail.com are fraudulent. These emails are from a fake website that could include a request to submit articles and promise to publish approximately two weeks after the submission. If you receive such an email, forward the message to currsci@ias.ac.in and delete the message.”

Besides publishing journals with fancy titles, there are several predatory journals that are clones of respected journals. The predatory version of Current Science is one such instance of a clone.

The give away

“Prof. S. C. Lakhotia, Department of Zoology at the Banaras Hindu University received an email from the predatory journal (currentsciencejournals@gmail.com) on July 1, and he alerted Prof. R. Srinivasan, the Editor of Current Science, ” says G. Madhavan, Executive Secretary at the association.

In an email sent to Prof Lakhotia, the predatory journal has invited him to contribute to the next issue of Current Science. Like all predatory journals, it lists out the impact factor, the acceptance rate of papers, which is 38%, and a promise to publish papers within two weeks of submission.

The mail is signed by “Prof. R. Srinevasan, Editor-in-Chief.” It is only a discerning reader who will know that Current Science does not send out such emails and that the original journal has only an Editor and not an Editor-in-Chief, as mentioned in the email. Also, Prof. Srinivasan’s name is wrongly spelt in the email.

“We are trying to get in touch with the Indian Computer Emergency Response team. Otherwise, there is little that we can do. So we are immediately informing people about the predatory journals,” says N.A. Prakash, formerly with the Indian Academy of Sciences.