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Principal & Chief Editor:

Dr. Sandesh Jagdale

Front Page Concept & Design:

Mr. A.V. Mulukh

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Address:-

Principal,

Dapoli Urban Bank Senior Science College, Dapoli

Dist. Ratnagiri -415712

Phone- 02358 283256

3. Name & Address of Principal:

Principal Dr. S. P. Jagdale

Dapoli Urban Bank Senior Science College, Dapoli

Dist. Ratnagiri -415712

Phone- 02358 283256

I, Shri Dr. S. P. Jagdale hereby declared that the particulars given above are true to the best of my knowledge and belief.

Sign /-

(Dr. S.P. Jagdale, Principal)

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

The Ethno medicinal Plant *Antidesma*



Antidesma acidum Retz. (Male Plant)



Antidesma acidum Retz. (Female Plant)

Scientific name- *Antidesma acidum* Retz.

Family- Euphorbiaceae

The genus *Antidesma* belongs to family Euphorbiaceae having more than 170 species are distributed throughout the world. The scientific name of *Antidesma* is derivative from the Greek word 'anti'-against and 'desma'-a band or constriction, indicating to its use as anti-snake venom.

Linnaeus first classified the dioecious plant genus *Antidesma* Burm. ex. L. in 1753. The genus is a member of the phyllanthoideae subfamily, specifically the subtribe Antidesminae. This subtribe's elongated, U-shaped anther connective is its most distinctive feature. Its two ovules in each ovarian locule sets it unique from the Euphorbiaceae family (Hoffmann, 1999).

Plant Morphology

Antidesma acidum Retz. grows to a height of three to five meters. The plant's young parts are glabrous, leaves characterized as simple with short petioles, alternate, widely elliptic obovate shape, pubescent edge, rounded base, often obtuse tip, and mucronate apex. Pedicillate flowers exhibit a raceme-type inflorescence. The male flower has two stamens, whilst the female flower has a glabrous ovary and a short, terminal style 2. Mature are green in color, when ripe, fruits are reddish red.

Uses

The leaves of *Antidesma acidum* Retz. are used as leafy vegetable and dry leaves of plant combined with other foods for acidic test. People consumed cooked and tender shoots with salt and chilli. Ripe fruits are consumed by people as Ranmeva, while mature fruits are utilized to make pickles.

Medicinal properties

Leaves used as an appetizer, in cases of diarrhea, and for headaches, to treat antidiabetic medications. Mature fruit decoction is used in children's stomachaches, muscle aches, pneumonia, blood dysentery, dropsy, dog bites, and for production of cow milk.

Nutritional composition

Leaves and fruits of *A. acidum* is rich source of carbohydrate, macro and micro elements, vitamins, crude protein, enzymatic and non-enzymatic antioxidants like carotenoids, polyphenols, flavonoids like quercetin, rutin, narigin, catechine. Whereas caffeic acid, gallic acid and chlorogenic acid, tartaric acid, 9-eicosyne, hexadecanoic acid, n-hexadecanoic acid, 11, 14-octadecadienoic acid, Tridecanoic acid, Gamma-Sitosterol, Phytol etc.

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Article by
Dr. Poonam Panaskar
Department of Botany

Could we make vibranium?



In the fictional Marvel universe, an element called vibranium can do many things. The fantastical metal makes up Captain America's near-impenetrable shield. It gives Black Panther superpowers. It also helps the futuristic African society of Wakanda run. There are shiny, metallic skyscrapers with blue neon lights. Flying vehicles that can shoot lasers. Video calls with 3-D holograms.

And all of this is due to that near-magical substance. A meteorite brought it to Wakanda long ago.

No one has discovered vibranium on Earth, of course. And scientists say that finding something similar is a long shot. However, mimicking some of the fabulous substance's superpowers might be a possibility.

What is vibranium?

Vibranium's key traits line up with our definition of metals, says Darryl Boyd. He's a chemist at the U.S. Naval Research Laboratory in Washington D.C. And as a Black Panther fan, Boyd has thought a lot about vibranium. Metals, he notes, should be able to conduct heat and electricity. They also should be shiny and able to be molded into sheets or pulled into wires.

"You can argue that you see all five [of those traits] throughout the various Marvel representations of vibranium," Boyd says. But the three that stick out to him are vibranium's strength, conductivity and luster.

In Wakanda, people use vibranium in medicine, electrical circuitry, fabrics, jewelry, communications and more. "The city transportation system runs by vibranium. And that implies pretty heavily that there's some kind of conductive nature," Boyd says. "So this, again, is consistent with what we know about the properties of metals."

It also looks shiny, bright and very regal. This is similar to other metals that can shine in brilliant colors, such as gold and silver.

What is the closest thing we have to vibranium?

"There's no perfect element" — at least on Earth, notes Sibrina Collins. She's a chemist at the Marburger STEM Center at Lawrence Technological University in Southfield, Mich. But Wakanda's vibranium "seems to be the perfect element," she says. In that land, it "can be used for absolutely everything." In fact, she notes, it "has aspects of various elements on a periodic table." In other words, there may not be one

substitute for vibranium. But many elements, combined, might fit the bill.

For instance, Boyd says, like titanium, vibranium is strong. It's also got the shine of silver or platinum and the electrical conductivity of copper. He concludes that vibranium "represents [a mashup] of the best properties of the metals that we know of."

Collins also compares vibranium to platinum because of its use as medicine in *Black Panther*. Platinum may not be the cure-all that vibranium is. But it is a part of some drugs used to treat cancer, such as cisplatin.

If vibranium were real, where would it go on the periodic table?

Having traits of so many metals makes it difficult to pin down where vibranium could go on the periodic table of elements. Collins suggests it would be in what's known as its D or F blocks. These elements appear in the table's middle and very bottom. Collins notes this is also where we find many of the metals that go into computers and other tech.

The periodic table typically groups elements with similar properties. If Boyd were to add vibranium to the table, he'd create another row and place it under uranium and neodymium.

"Neodymium is used in magnets," he points out. "It's in almost all your computers." In fact, he argues, "It's an incredibly important element that people don't talk enough about."

The movies also suggest vibranium is radioactive. That would make it similar to uranium. That's an element used to generate nuclear power. "If [Black Panther or Killmonger] were too close to the train tracks, then their suits became ineffective," Boyd notes.

"And that suggests to me that there's some characteristics there — within the vibranium — that can alter behavior in a way that might be similar to radioactivity."

Could we ever make vibranium?

It's unlikely any one material could perfectly mimic vibranium. But scientists could use other metals to do some of what vibranium can. Collins is interested in how vibranium was used to heal a gunshot wound. And she wonders if other metals, too, might be used in a hospital setting or in drugs.

Boyd agrees that making vibranium or something similar is unlikely. "But do I think there are some aspects that may exist that we could explore in the future — and maybe make it a reality? I do think so."

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*Article by
Mr. Shantanu Kadam
Department of Chemistry*

“Share market” as Emerging Career Opportunity

Traditionally, everyone who speaks about Stock Markets has a reputation of using terms such as gambling, betting, and speculation which discourages people from building a career in the stock market.

With the growth and evolution of the trading industry in India, more and more people are looking for employment opportunities in this domain, hoping to make a career in the share market.

India's equity market has been performing exceptionally well. With a market capital of \$3.4055 trillion, India has become the world's 6th biggest stock market. The field has also attracted young professionals and the country has 69 million Demat accounts. With over half a million people in the country into day trading, the number is steadily increasing. Since the market is one of the top performers among large economies, the employment for stock market professionals is forecasted to grow faster than average employment by 2026. A career in the stock market is not only limited to traders or investors but has various other areas that you can choose as per your interest and preferences.

Career opportunities

The growing trend and lack of expertise and knowledge have created a great demand for stock brokers and other fields in the stock market. Here are some of the career opportunities that are high in demand due to the growing and emerging trend:

- Stockbroker
- Investment Advisor
- Financial Advisor
- Online Stock Trader

- Portfolio Management Services (PMS)
- Equity Analyst (Fundamental/ Technical)
- Financial Analyst
- Research Analyst
- Market Researcher
- Insurance distributor/advisor
- MF Distributor/Advisor

Education and Qualifications

For those who are looking for jobs in the stock market for freshers, it's crucial to examine the eligibility criteria and check if you meet it. While many traders are generally self-taught, a relevant college degree gives you a competitive edge and is almost a prerequisite these days if you wish to build a serious stock trading career. Ideally, one should start by taking the commerce or finance education stream after 12th standard in order to get a comprehensive understanding of the job roles in the trading industry. Some popular streams are CFA, Master in Finance, FRM, and NISM Certifications.

Chartered Financial Analyst (CFA) - CFAs are the most popular career option in the industry. The CFA international certification program offered by the CFA Institute. It is similar to the Chartered Accountant (CA) certification course, and the exam can be given from any certified center across India. This qualification makes you eligible for positions like Research Analyst and Fund Manager. Anyone with a bachelor's degree in any stream can apply for this certification.

Financial Risk Manager (FRM) - FRM is also an internationally recognized

certification program offered by the GARP organization. Giving you a strong foundation of the concepts of the risk management aspect of the market, this certification opens up risk management roles in the stock markets as well as financial institutions like banks, insurance companies and NBFCs. You do not require a bachelor's degree to appear for the exam, however you need to work for two years on a financial risk portfolio to get certified.

Master in Finance - You can opt for MSc Finance or MBA Finance; this course educates you on nearly every aspect of the financial market and gives you an undeniable edge over your competitors.

How to become a successful trader?

In order to become a successful trader, keep the following in mind:

- Formulate a clear, straightforward trading plan. The trading plan's objectives must be clearly outlined and should be of purpose to the trader.
- Familiarize yourself with the technology, platforms and various methods for employing a strategy.
- Build trust and consistency in your strategy through repeated execution and testing. Be patient and persistent; over time your experience and expertise will both grow
- Beware of behavioral pitfalls like recency bias, revenge trading and stereotyping.
- Maintain certain rules, standards and milestones for yourself as a trader.

However, it is important to note that share marketing also comes with its challenges. The industry can be highly competitive, requiring individuals to stay

updated with market trends and continuously improve their skills. Additionally, the job can be stressful as it involves managing clients' investments and dealing with market fluctuations.

Overall, share marketing can be a good career path for those who are passionate about finance, enjoy working in a fast-paced environment, and have the drive to succeed in a competitive industry in this industry. Additionally, gaining practical experience through internships or entry-level positions can provide valuable insights and help establish a network in the finance industry.

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*Article by
Mrs. Rohini Geete
Department of Commerce*

E- Governance

E-government refers to the use of innovative information and communication technologies (ICT), particularly web-based Internet applications, to provide citizens, businesses, and government employees with convenient access to government information and services, improve the quality of services, and enhance opportunities for democratic participation. The term “e-government” is also known by different names such as Electronic Governance, Digital Government, Online Government, and e-Gov, among others.

The diversity of e-government services has given rise to different types of e-government, which can be classified into four main categories: government-to-citizen (G2C), government-to-business (G2B), government-to-government (G2G), and government-to-employee (G2E).

The G2C application is the most common type of e-government, and its primary goal is to serve citizens by making public information more accessible through the use of websites and reducing the time and cost to conduct transactions. G2C initiatives can connect citizens who may not otherwise come into contact with one another, facilitate and increase citizen participation in government, and support accountability, democracy, and improvements to public services.

The G2B application includes various services exchanged between government and the business sectors, such as obtaining current business information, new regulations, downloading application forms, lodging taxes,

renewing licenses, registering businesses, obtaining permits, and many others. G2B transactions bring significant efficiencies to both governments and businesses, enhance the efficiency and quality of communication and transactions with business, and increase the equality and transparency of government contracting and projects.

The G2G application refers to the online communications between government organizations, departments, and agencies based on a super government database. G2G development aims to enhance and improve inter-government organizational processes by streamlining cooperation and coordination. The use of information technologies by different governmental agencies to share or centralize information or automate and streamline intergovernmental business processes has produced numerous instances of time and cost savings and service enhancement.

The G2E application is the least sector of e-government in much e-government research. It refers to the relationship between government and its employees only and aims to serve employees by offering some online services such as applying online for annual leave, checking the balance of leave, and reviewing salary payment records, among other things. G2E is a successful way to provide e-learning, bring employees together, and encourage knowledge sharing among them. It gives employees the possibility of accessing relevant information regarding compensation and benefit policies,

training and learning opportunities, and allowing them access to manage their benefits online with an easy and fast communication model.

The development and implementation of e-government initiatives depend on a range of factors, including national context, political and institutional factors, socio-economic and cultural factors, and technical infrastructure. National context refers to the broader political and legal context in which e-government is developed and implemented, including the nature of the political system, the level of economic development, and the cultural and historical background of the country. Political and institutional factors refer to the institutional arrangements and governance structures that underpin e-government initiatives. Socio-economic and cultural factors refer to the social and cultural values and beliefs that influence the adoption and use of e-government services. Technical infrastructure refers to the technological infrastructure required to support e-government services, including hardware, software, telecommunications, and human resources.

In conclusion, e-government is a way for governments to use ICT to transform the structures, operations, and culture of government. The development of different types of e-government reflects the diversity of user needs and priorities in government strategies. The successful development and implementation of e-government initiatives depend on a range of factors, including national context, political and institutional factors, socio-economic and cultural factors, and technical infrastructure. E-government

has the potential to improve the quality of services, enhance opportunities for democratic participation, and support accountability and good governance objectives.

E-SPIN is dedicated to building a value-added ecosystem for its customers, suppliers, and business partners, with the belief that everyone can benefit from working together (Together Everyone Achieve More = TEAM). If you are a potential new supplier or business partner with value-adding solutions, or a new customer looking for trustworthy solutions, feel free to reach out. E-SPIN is always eager to explore ways to create synergistic outcomes for all parties involved. This is the underlying philosophy of E-SPIN business.

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Article by -

Prof. Shravya Pawar

Department of Computer Science

Recycling crop and animal waste is a win for green farming



Restoring links between farming processes and livestock rearing can reduce air and water pollution, and help farmers meet rising costs. Low domestic production and reliance on imports for pulses, legumes and leguminous oilseeds have seriously affected India's nutritional security. The green revolution was tweaked to a starch/carbohydrate one, a shift that continues despite rising diabetes incidence, while limiting India's self-sufficiency in producing proteins and edible oils.

Skewed government procurement at minimum support prices (MSP), and preference of farmers to grow crops to sell at MSP, made matters worse with steadily rising input costs and falling output prices. Farmers continue to have low incomes, while consumers face increasing food prices.

Crop and livestock farming are ecologically interconnected, and the waste from one is a resource for the other. Farm waste is used as animal feed or is composted, while animal dung, poultry droppings serve as manure, saving the spend on fertilizers. Crop farmers who don't rear cattle must buy their manure or fertilizer, and livestock farmers must buy grass or commercial feed. In the process,

waste management becomes a common problem for both, leading to air and water pollution.

Fertilizer-based emissions of nitrous oxide and ammonia from burning residue and dung cakes contribute to air pollution, while water pollution is caused by the loss of nitrogenous or phosphate compounds from fertilizers or manure into the soil and water bodies.

Nutrients form a huge proportion of the wastewater (untreated or partially treated) that is dumped into lakes and rivers causing pollution and eutrophication. Mitigation is possible by adopting simple measures for both input and output management. Legume-based cropping systems- Nitrogen compounds constitute the predominant input for crops, whether as manure, compost or fertilizer such as urea. Legume crops including pulses and oilseed legumes like groundnut, soybean and sesame have natural capability to fix atmospheric nitrogen with the help of symbiotic N-fixing microbes in their root nodules.

These crops can not only survive without nitrogenous fertilizers, but also leave behind usable nitrogen and other residual nutrients sufficient to support non-

legumes in the vicinity or in the next crop. The green revolution increased the dependence on fertilizers and hampered self-reliance in pulses and oilseeds.

Wastewater and solid waste are important sources of nutrients but India's current capacity for their recovery and recycling is barely 20%. Though technologies and best practices exist to recycle livestock and crop wastes, there is little administrative commitment or investment to take appropriate measures. In the process, of 65,250 metric tons of nutrients contained in more than 150 billion liters of wastewater produced per day in India, 84% is lost every day.

Forty percent of average daily fertilizer consumption of about 1, 37,000 metric tons could be saved if recoverable nutrients from wastewater could be recycled. Similarly, recycling all of the 15kg manure produced per animal per day and 15-20 liters of urine per animal per day, by an estimated 191 million, and all wastewater, could yield nutrients to the tune of 3,35,000 metric tons, which is 60% more than India's daily fertilizer consumption.

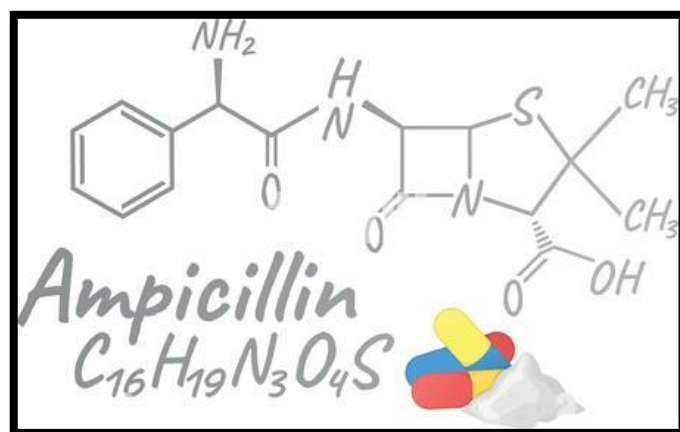
Legume-based multi-cropping and inter-cropping systems would further reduce the demand for fertilizers and manure. Recycling nutrients would reduce air and water pollution, and improve economic yields.

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<https://www.nature.com/articles/>

*Article by -
Ms. Aishwarya Mahajan
Department of Environmental Science*

Ampicillin



History

Ampicillin has been used extensively to treat bacterial infections since 1961. Until the introduction of ampicillin by the British company Beecham, penicillin therapies had only been effective against gram-positive organisms such as staphylococci and streptococci. Ampicillin (originally branded as "Penbritin") also demonstrated activity against gram-negative organisms such as *H. influenza*, coliforms, and *Proteus* spp. Ampicillin is an antibiotic belonging to the amino penicillin class of the penicillin family. The drug is used to prevent and treat a number of bacterial infections, such as respiratory tract infections, urinary tract infections, meningitis, salmonellosis, and endocarditis. It may also be used to prevent group B streptococcal infection in new-borns. It is used by mouth, by injection into a muscle, or intravenously.

Common side effects include rash, nausea, and diarrhoea. It should not be used in people who are allergic to penicillin. Serious side effects may include *Clostridium difficile* colitis or anaphylaxis. While usable in those with kidney problems, the dose may need to be decreased. Its use during pregnancy

and breastfeeding appears to be generally safe.

Ampicillin was discovered in 1958 and came into commercial use in 1961. It is on the World Health Organization's List of Essential Medicines. The World Health Organization classifies ampicillin as critically important for human medicine. It is available as a generic medication.

Mechanism of action

The amino group (highlighted in magenta) is present on ampicillin but not penicillin G.

Ampicillin is in the penicillin group of beta-lactam antibiotics and is part of the amino penicillin family. It is roughly equivalent to amoxicillin in terms of activity. Ampicillin is able to penetrate gram-positive and some gram-negative bacteria. It differs from penicillin G, or benzyl penicillin, only by the presence of an amino group. This amino group, present on both ampicillin and amoxicillin, helps these antibiotics pass through the pores of the outer membrane of gram-negative bacteria, such as *E. coli*, *Proteus mirabilis*, *Salmonella enterica*, and *Shigella*.

Ampicillin acts as an irreversible inhibitor of the enzyme transpeptidase, which is needed by bacteria to make the

cell wall. It inhibits the third and final stage of bacterial cell wall synthesis in binary fission, which ultimately leads to cell lysis; therefore, ampicillin is usually bacteriolytic.

Medical uses

- Gastrointestinal infections caused by contaminated water or food (for example, by Salmonella)
- Genito-urinary tract infections.
- Healthcare-associated infections that are related to infections from using urinary catheters and that are unresponsive to other medications.
- Otitis media (middle ear infection)
- Prophylaxis (i.e. to prevent infection) in those who previously had rheumatic heart disease or are undergoing dental procedures, vaginal hysterectomies, or C-sections. It is also used in pregnant woman who are carriers of group B streptococci to prevent early-onset neonatal infections.
- Respiratory infections, including bronchitis, pharyngitis.
- Whooping cough, to prevent and treat secondary infections.
- Ampicillin used to also be used to treat gonorrhoea, but there are now too many strains resistant to penicillins.

Side effects

Ampicillin is comparatively less toxic than other antibiotics, and side effects are more likely in those who are sensitive to penicillins and those with a history of asthma or allergies. In very rare cases, it causes severe side effects such as angioedema, anaphylaxis, and *C. difficile* infection (that can range from mild diarrhoea to serious pseudomembranous colitis). Some develop black "furry" tongue. Serious adverse effects also include seizures and

serum sickness. The most common side effects, experienced by about 10% of users are diarrhoea and rash. Less common side effects can be nausea, vomiting, itching, and blood dyscrasias. The gastrointestinal effects, such as hairy tongue, nausea, vomiting, diarrhoea, and colitis, are more common with the oral form of penicillin. Other conditions may develop up several weeks after treatment.

Overdose

Ampicillin overdose can cause behavioural changes, confusion, blackouts, and convulsions, as well as neuromuscular hypersensitivity, electrolyte imbalance, and kidney failure.

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Article by:

Miss.Fauziya Chiplunkar

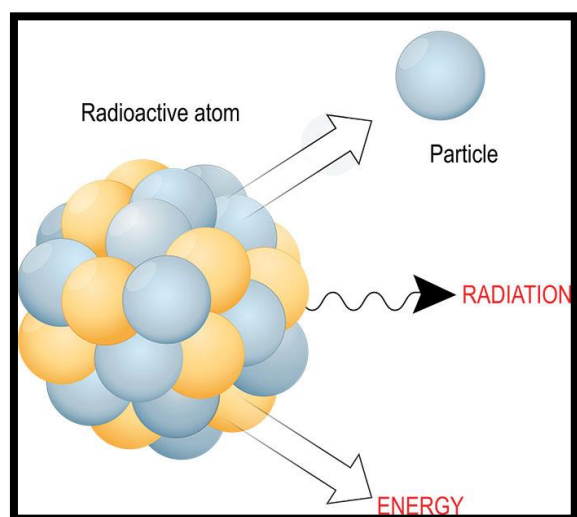
Department of Microbiology

Radiation and radioactive decay

Chemical elements can take several related forms, known as isotopes. Some of these forms are unstable, also known as radioactive isotopes. But they don't want to be unstable. So they morph by shedding one or more subatomic particles. Through this process, they naturally transform into a more stable (and always smaller) element.

The expelled particles and energy are known as radiation. That morphing process is called radioactive decay.

The radiation emitted by that decay can take several forms. Often, it sheds light (a form of energy), an alpha particle (two neutrons bound to two protons) or an electron or a positron. But there are a whole host of other tiny particles that might also be shed.



You can picture the decay process by imagining a bowl filled with green and purple grapes. The bowl represents an atom's nucleus. Each green grape represents a proton.

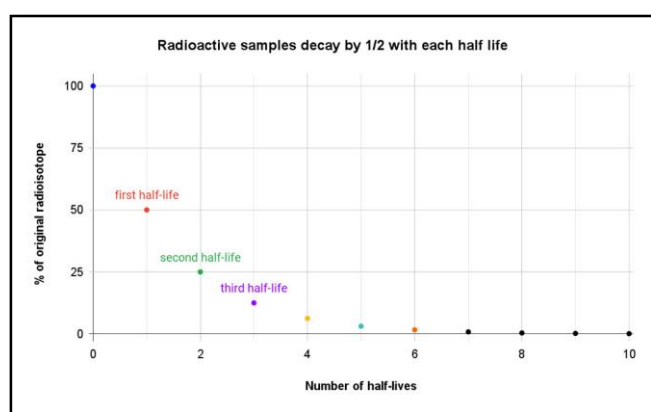
Each purple grape stands in for a neutron. Let's say the bowl fits exactly 40 grapes (which would represent the nucleus of a calcium atom). Now let's imagine that you try to put in 22 purple grapes instead of 20. You might be able to balance the two extra grapes on top of the pile for a while. But sooner or later, even a small bump to the side of the bowl will make at least one of them spill out.

The protons and neutrons inside the nuclei of radioactive isotopes are unstable in a similar way. But it doesn't take a tap to make an unstable atom decay. Forces holding together the protons and neutrons inside an atom's nucleus are out of balance. This atom now strives to become balanced. To do this, it gives off some of its energy and particles. Or, it changes one or more of its neutrons into protons, also releasing energy. There are lots of ways the decay can happen. But the result is the same: the unstable isotope eventually becomes a new, stable one.

Morphing at a clock-like rate

How long it takes an isotope to decay depends on a lot of factors. But scientists describe the process in terms of its half-life. An isotope's half-life is defined as the amount of time it takes for one-half of the atoms of a radioactive isotope to decay. That half-life is always the same — like an unwritten rule — that is specific to each isotope.

If you start with 80 unstable atoms, 40 will remain at the end of the first half-life. The rest will have decayed to a new isotope. After two half-lives, just 20 atoms of the original isotope would remain. Three half-lives would leave only about 10 atoms of the original isotope. By the end of the fourth half-life, there are only five atoms of the original isotope. All of the rest have morphed into stable atoms.



Some isotopes decay very quickly. Take the lab-made isotope lawrencium-257. Its half-life is little more than a half-second. Other isotopes may have a half-life measured in hours, days or years. Then there's the real record-holder: xenon-124. In April 2019, a team of researchers identified its half-life as 18 billion trillion years. That's more than a trillion times the current age of our universe! (This isotope's decay occurs as two protons in the nucleus each absorb an electron from the atom's outer shell and then release a neutrino. This transforms both protons into neutrons and creates tellurium-128.)

Some decays involve an atom's nucleus ejecting a single particle.

Other decays may be a complicated multi-step process. For instance, sometimes one isotope ejects energy and a particle, which then results in a new unstable isotope. This interim atom now decays (with a new half-life), again shedding energy and some particles as it seeks to become stable. Still other decay chains can lead one element to morph into two or more different ones on its path to stability. For instance, uranium-238 decays into radioactive isotopes of thorium, radium, radon and bismuth — before ending up as the non-radioactive lead-206.

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Article by:

Mr. Vishvesh Joshi

Department of Physics

How poison dart frogs ship defense toxins to their skin



A diet of insects gives poison dart frogs their toxic skin. That, in turn, helps them fend off predators. To get from food to skin, chemicals in the frogs' guts may hitch a ride there via molecular "taxicabs."

There are more than 175 species of poison dart frogs. As a group, these animals host more than 500 chemical poisons. These compounds belong to a class called alkaloids. The frogs don't make these chemicals, though. They pick them up from the insects these amphibians eat. How these chemicals make it from a frog's guts to its skin has been a mystery. "[P]oison frogs exist just as a ball of toxins," says Roberto Márquez. As an evolutionary geneticist and herpetologist, he studies animals like frogs at the University of Michigan in Ann Arbor. He did not take part in the new study.

How frogs have been able to host those toxins without themselves getting poisoned has been a puzzle. Researchers had thought it might have to do with the frogs' metabolism. That refers to the

chemical reactions in cells that change food into energy. Proteins that can bind alkaloids were also primary suspects, Márquez says. That could allow them to pull toxins from their food, "move them to [their] skin and not die trying."

Now, for the first time, scientists identified one of those proteins. They call it alkaloid-binding globulin, or ABG. Researchers shared their new findings December 19 in eLife.

The frog ABG is much like other proteins that move chemicals within mammals. Studying their similarities might one day help scientists create treatments for people who have been poisoned.

From a fishing expedition

Aurora Alvarez-Buylla led the team that found ABG. She's a biologist at Stanford University in California. To look for the protein, her group went "fishing" around in cells using a molecular bait. This team mixed this lure in lab dishes. The lure was similar to an alkaloid found in the blood

of Diablito poison dart frogs (*Oophaga sylvatica*). The researchers wanted to see if any proteins would pick up the lure and move it. ABG took the bait most often. Then, the team studied genes in wild Diablito frogs from Ecuador. Genes are like tiny blueprints within cells that determine different traits about the body. The genetic data showed that frog livers make ABG. In another experiment, the researchers used fluorescent markers to track the protein in the frog's body. That showed ABG hangs out in the gut and skin as well as in the liver. There are still hundreds more toxins that the team didn't test. "There's definitely more to explore there," Alvarez-Buylla says. Márquez agrees. He adds that scientists still don't know how common ABG is across the entire family tree of poison dart frogs. Also unknown is how the protein does its job. Perhaps ABG has a precise method to pick up and release poisons. "Maybe the frogs resist them anyway and this is just like the little cart that transports stuff around," Márquez says. With this ABG situation "very beautifully figured out," he's excited to understand more about how poison dart frogs handle their body full of toxins.

Reference:

<https://www.snexplores.org/article/poison-dart-frog-transport-toxins-skin>

Article by:
Mr. Sujit Temkar
Department of Zoology

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