The Daily Star

SCIENCE & LIFE

DHAKA TUESDAY JANUARY 12, 2010, E-MAIL: science&life@thedailystar.net

FROM THE BACKYARD

Drink from Bel

MALIHA AFRIN

We are more or less familiar with 'Bel shoot,' a herbal medicine, for curing constipation and other diseases. The green fruit is chopped into thin slices and dried in the sun. The Bel shoot is then soaked overnight in water and its extract is taken as medicine.

Ripe Bel, too, is eaten as much. The ripe fruit is nutritive and highly valued as an agent to clear the bowel. Bel (scientific name, Aegel Marmelos Linn), or wood apple in English, usually grows in the wild. Nowadays, many cultivate it in their neighbourhood for its medicinal and nutritive value. But its hard shell, sticky texture and numerous seeds make it difficult to eat. Moreover, the fruit is seasonal.

Scientists at the 'Carbohydrate Section' of the Bangladesh Council of Scientific and Industrial Research (BCSIR) meanwhile have experimentally shown that powdered Bel can be used as a drink without affecting the quality of the fruit for at least one year and a half. The pulp of the ripe fruit is mixed with sugar, then dried and powdered. In this way we can prepare instant Bel drink.

This powder can be packaged and marketed. The process is easy and one can always make it at home and preserve for use anytime of the year.

The writer is a final year B.Sc (Hons) student at Home Economics College, Dhaka

STRANGER TRUTHS

Boobies were a species of bird on the Galapagos Islands

More evolution mystery

FROM bizarre butterfly spots to rainbow-colored lizards to adaptations that allow squirrels and even snakes to "fly," physical innovations in the natural world can be mind-boggling.

Natural selection is accepted by scientists as the main engine driving the array of organisms and their complex features. But is evolution via natural selection the only explanation for complex organisms?

"I think one of the greatest mysteries in biology at the moment is whether natural selection is the only process capable of generating organismal complexity," said Massimo Pigliucci of the Department of Ecology and Evolution at Stony Brook University in New York, "or whether there are other properties of matter that also come into play. I suspect the latter will turn out to be true."

Some scientists are proposing additions to the list of evolutionary forces.

"Over the past decade or two, scientists have begun to suspect that there are other properties of complex systems (such as living organisms) that may help, together with natural selection, explain how things such as eyes, bacterial flagella, wings and turtle shells evolve," Pigliucci toldLiveScience.

Source: Livescience

SCIENCE QUIZ

Quiz 1
Who said the following: "Information is not knowledge"?

a. Nikola Tesla.
b. Albert Einstein.
c. Thomas Edison.

Quiz 2
The Niepce Crater on the Moon was named in recognition of the famous inventor Joseph Niepce. What did he invent ?

a. A telescope.
b. A camera.
c. A microscope.

For answers see next issue

Answers to last week's Quiz
Quiz 1: a)Telescope.
Quiz 2: c) Microscope.

Collected:

HYDROPONICS

Growing crops without soil

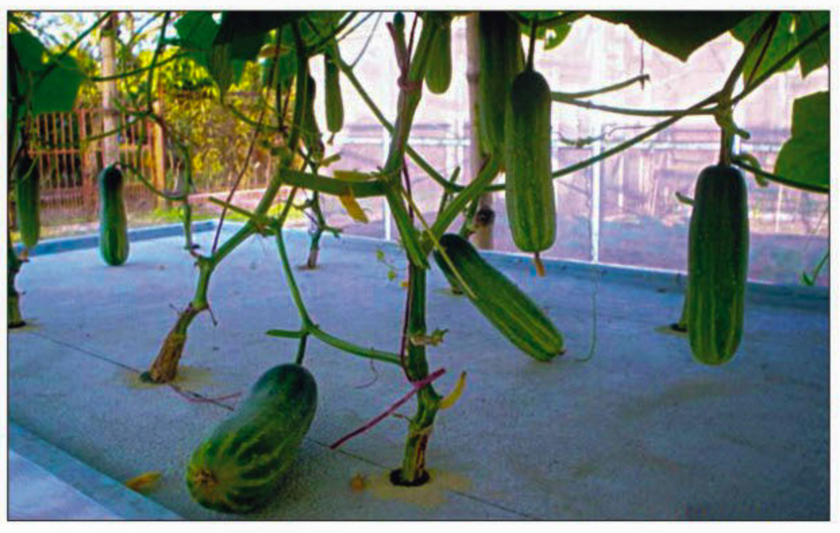
DR KSHIRODE C. ROY

HYDROPONICS is a modern method of crop production. In this method, crop is grown not on soil, but artificially in a protective environment using mineral nutrient solutions in water. In the 19th century, scientists discovered that plants absorb essential mineral nutrients as inorganic ion in water. Soil acts as a mineral nutrient reservoir. When water is added to the soil, it dissolves the mineral nutrients. Those are absorbed by plant roots. Soil is no longer required for plant growth when mineral nutrients are properly introduced into plant's water supply artificially.

Hydroponics is used to grow high value crops like fruits, vegetables and flowers commercially in Europe, USA, Japan, Taiwan, China, Thailand, Singapore, Malaysia and the Middle East.

As no soil is necessary, this method can be profitably applied to grow crops in window-boxes or on rooftops in a crowded city where there are no gardens to grow fresh vegetables and fruits.

Deserts, rocky and stony ground in mountainous areas or barren and sterile lands may be made productive at a relatively low cost through the adaptation of hydroponics. As the plants are not susceptible to soil-borne diseases, the quality of the produce is excellent. The plants are not affected by weeds, which are a source of serious problem in the traditional method of crop production.



Cucumbers growing on rooftop using hydroponics technology

For raising seedlings, 25 mm by 25 mm size sponge blocks are used. In the middle of each block, one seed is placed. Seeds are treated before putting in the blocks. The blocks are then put in a tray having 50 to 80 mm water so that sponges can easily float in water. Seedlings of appropriate age are later placed in holes made on cork sheets to grow plants.

Soil is not essential for crops

There are usually two systems of hydroponics. In the circulating system, nutrient solution is made to flow past the roots of plants in trays for at least seven to eight hours by pump through pipes. In the non-circulating system, plants are grown in containers of nutrient solution, such as glass jars, plastic buckets, tubs or tanks. No pumps or water circulation is required. A gap of 50 to 70 mm is maintained between solution and cork sheet placed above it in such a way that roots are above the solution to get oxygen. Holes are made in cork sheets so that plants can get required oxygen through it. It has been estimated that water requirement in hydroponics is as little as 1/20th, or 5% of the amount used in a regular farm to produce the same amount of food.

Nutrient solutions are made of potassium nitrate, calcium nitrate, potassium hydrogen phosphate and magnesium sulphate. Various micro-nutrients like iron, manganese, copper, zinc, boron, molybdenum etc., are typically added to the hydroponics solutions. Solutions are added in trays after every 12 to 15 days.

Proper maintenance of pH and electrical conductivity (EC) is very important in hydroponics. pH and EC should be checked in the morning and afternoon to maintain them between 5.8 to 6.5 and 1.5 to 2.5 ds/m, respectively.

In recent years, the scientists of Bangladesh Agricultural Research Institute (BARI)) have successfully produced cucumber, tomato, lettuce, capsicum, strawberry and marigold in both circulating and non-circulating systems. It is expected that this modern method of high value crop production will be adopted in the near future as entrepreneurs are coming forward to invest in agriculture on a commercial.

The writer is an Agricultural Engineer and former DG, BARI.

OUR LEADING LIGHTS

PROFESSOR M. INNAS ALI

An undying soul dedicated to science

JAMAYET ALI

BORN at Netrokona in September 1916, Dr. Innas Ali was awarded the M.Sc. degree in Physics from the University of Dhaka in 1940 and stood First class First in the Electronics group. His research subject in M.Sc. course was 'Atmospherics at Dacca in mid and high frequency channels'. He carried out research in Ph.D. course on Nuclear Physics, electron design and construction of the 25 MeV electron accelerator, the Micotron and studies in nuclear structure under the supervision of Professor (Sir) H.S.W. Massey, F. R. S., the then Chairman of the Department.

He received Master of Electrical Engineering (M.E.E.) degree from the U.S.A. (1947-1948). Dr. Ali also performed research on "Dielectric properties of Crystals in the radio frequency range" in the Indian Institute for cultivation of science under supervision of K.S.Krishnan in Calcutta from 1941-1942.

Dr. Innas Ali held many important positions at home and abroad. He was Professor and Head of the Department of Physics, Dhaka University (!948-1963). Other positions he held include: Member, Pakistan Atomic Energy Commission (1963-1967); Dean of the Faculty Science, Dhaka University (1968-1972); Vice-Chancellor, Chittagong University (1972-1973); Founding Member, University Grants Commission; Founding Chairman, Bangladesh Atomic Energy Commission (1973-1976); Science Advisor to the President of Bangladesh; Member, Planning Commission (1976-1979); Professor of Nuclear Engineering, King Abdul Aziz University, Jeddah (1979-1982); Founder Chairman, ESTCD Trust and Rector of Independent University of Bangladesh (1990).

Professor Ali led Pakistan delegation to the UN Conference on Peaceful Uses of Atomic Energy held in Geneva in 1958 and 1964, respectively. He was the Member, Pakistan delegation to the UNESCO General Conference in 1962 and 1964; Member, Pakistan delegation to the International Atomic Energy Annual Conferences (IAEA), 1964 and 1966; Governor, Board of Governors, IAEA, 1966-1967 and 1975-1976.

He also led Bangladesh delegation to the IAEA General Conference in 1974, 1975 and 1976; became Member, Expert Committee of Organization of Islamic Conference (OIC) for founding IFSTAD (1975-1979).

Dr. Ali was the elected fellow of the Third World Academy of Sciences (TWAS) in 1991 and President, Bangladesh Academy of Sciences (1988-1992).

In recognition of his significant work, he was awarded Bangladesh Independence Day national Award for Science and Technology in 1991. He was offered the position of Bangladesh National Professor in 1994. He also received Lifetime Achievement in Science and Technology Award, Bangladesh Academy of Sciences 2007; Science Education and Research, Honorary Fellowship, Bangla Academy 2007.

This leading light of science is now on his deathbed. He is now under his daughter's care at her Shyamoli residence in Dhaka.

The author, a regular science writer, formerly served as PRO of the BCSIR.

'FISHY' MANNERS

Fish disciplines fish for 'bad manners'!

MALES of a certain fish species will punish females when they misbehave while eating, a new study finds.

And the chastisement occurs even though the males are not directly affected by the female's trouble-making, indicating that these fish may exhibit a form of human social behavior known as third-party punishment, the researchers say.

The fish, called Labroides dimidiatus, are a type of "cleaner fish" getting their name from the fact that they clean larger marine inhabitants by removing tiny parasites, which become food for the smaller fish. While the cleaner fish's "clients" are happy to have their bodies tidied of parasites, they become irritated if the cleaners take a bite out of their mucous tissue, and may even swim away.

Although mucus may not sound like the most appetizing meal, cleaners actually prefer to eat mucus. But the cleaners must resist this temptation if they want their dinner to stick around.

Researchers at the Zoological Society of London recreated this three-party dilemma in laboratory experiments, using an underwater plate to represent the client fish. The plate contained both fish flakes and prawns, with the latter being the much preferred cuisine.

A seemingly altruistic cleaner fish

However, the researchers took away the plate if any of the fish ate a prawn (as if the client were to swim away). They saw that the male cleaner fish - even in this unfamiliar lab setting - would punish, or chase away, the female fish if the females ate a prawn. Once the females had been chastised, they were less likely to gulp down prawns.

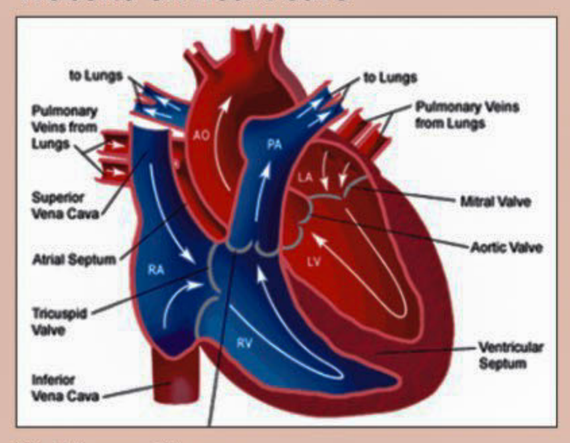
While the male behavior may seem altruistic - since the clients, not the males, are the victims of the female's bites - the males are actually acting in their own self-interest. "By punishing cheating females, the males are not really sticking up for the clients but are making sure that they get a decent meal," Nichola Raihani, a study author, said in a statement.

The researchers suggest that in a natural setting, the males might benefit with more food if they punished bad-mannered females.

Source: AFP

WATCH YOUR HEART

Website on heart care



DR. MAHBUB MANSUR

INCIDENCE of heart diseases is increasing every year globally at an exponential rate. It is assumed that 15-20 million people in Bangladesh are affected with some form of heart diseases. With the advent of information technology, it has now become possible to bring management and prevention of heart diseases at your fingertip.

A website titled **www.heartearebd.com** has been launched with a view to creating a widespread awareness against heart diseases. The present writer, who is a cardiologist by training and profession, is the initiator of the project.

Any person can send any question on heart diseases and he will get an answer within 24 hours.

The whole program is absolutely complementary. There are chapters on all related cardiac topics-primary and secondary preventions, risk factors for heart diseases, angiogram, angioplasties, bypass operation and its aftermath, rehabilitation after angioplasty or bypass operation and food habit for a cardiac patient.

All these chapters are written in easy non-medical terms so that everyone can understand. Anyone who is not a patient can also have knowledge about heart diseases from the website.

So, grab a chair, turn on your PC or laptop and browse through **www.heartcarebd.com.**

The writer is a Consultant Cardiologist at Ibrahim Cardiac Hospital, BIRDEM, Dhaka.