The National Field Research Centre for Environmental Conservation
About innovative Environmental Research

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Sultanate of Oman
Diwan of Royal Court

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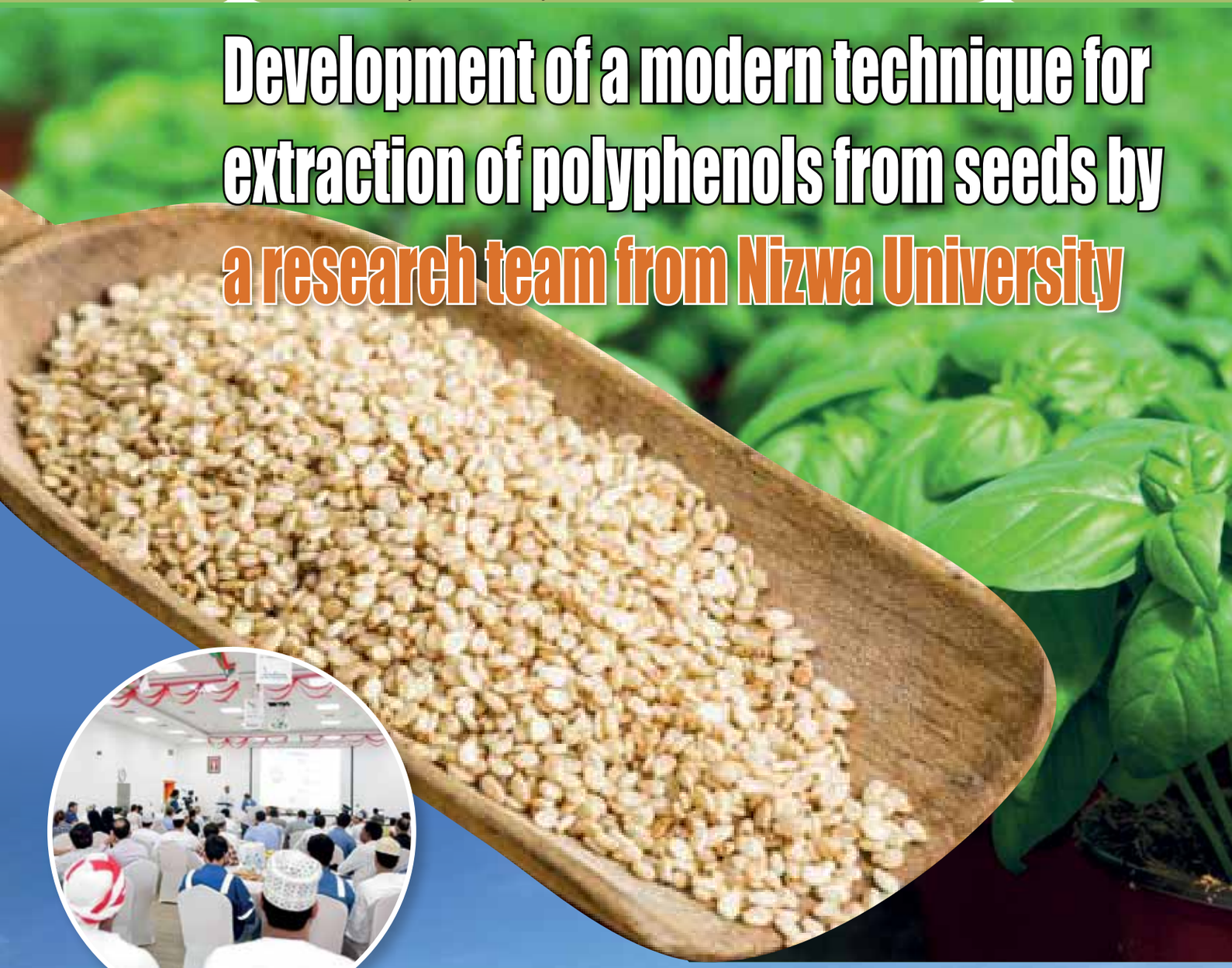
Development of a modern technique for extraction of polyphenols from seeds by a research team from Nizwa University



Important Information

Holocene's extinction:

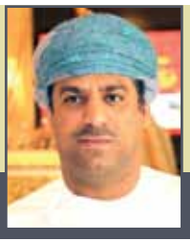
Is the term used to describe what is believed to be mass extinction. Nowadays, modern human history is part of the Holocene era, which began 10,000 years ago and is sometimes called the sixth great extinction as the sixth great mass extinction in the history of the earth. Life in the planet has gone through six types of extinction, the last of which is the extinction of Holocene or the Holocene extinction, which is an extended and different phase from the extinction species that have destroyed most species of organisms that we can not limit them. In particular, the Cretaceous extinction is known for being responsible for the disappearance Dinosaurs and a large number of organisms but not the most violent, the extinction of the Permian era, which occurred 248 million years ago has caused the disappearance of more than 96% of living organisms according to current estimates. Recent human activities, especially overfishing, environmental destruction and pollution, are the main causes of this extinction, making it the first mass extinction in the history of the earth caused by species of living organisms themselves.

Organized by Salalah Methanol Company

«A Volunteer in My Environment» Participates in the Health, Safety, Security and Environment Forum

The program of (A Volunteer in My Environment), from the National Field Research Centre for Environmental Conservation (NFRCEC) at the Diwan of the Royal Court, participated in the Forum of Health, Safety, Security and Environment the year 2018, which was organized by Salalah Methanol Company at its headquarters in the Salalah Free Zone. The team presented a paper titled «Youth is Great Energies in Environmental Volunteering for Changing the Society). In its paper, the team reviewed its experience and role in consolidating its cooperation system and spreading awareness and environmental culture with the support of service institutions and a group that is desirous to highlight the energies of young people and to translating such energies on the land for achieving the noble goals that serve the community. The participants also reviewed the (A Volunteer in My Environment) program. The program, in its different stages is keen to qualify Omani youth. The team started with 16 volunteers from the University of Sharqia. But after the participation of many universities and colleges in the Sultanate, the number of volunteers increased to 30 and the number is increasing in favor of the environmental awareness on various issues. The volunteers are able to establish new environmental teams. The forum, organized by Salalah Methanol Company, is part of the company›s ongoing efforts to highlight and share experiences and best practices on HSE aspects and crisis management. The forum was attended by a number of experts in the fields of health, safety and environment, with the presence of a number of governmental officials and officials from industrial and service sectors. As well as the officials of neighboring and contracting companies in the governorate.

point of view



Lush gardens .... But!!

Dr. Dawood Sulaiman Al Balushy
Editor-in-Chief

At first glance, you will see lush gardens with natural beauties which God gave to the marine environment in the Sultanate. It is charming sceneries that is capable of catching hearts and eyes. It fills you with satisfaction that the marine environment in Oman, is a precious treasure, buried deep under the sea water, receives the strings of the sun and covered with peace and security. It is the coral reef gardens that adorn the beaches and bays of the Sultanate extending from Musandam Governorate at the north to the border of Dhofar Governorate in the south.

Our marine gardens are natural aesthetics of marine life that go deep into the history of Oman, contribute to the prosperity of marine life of diverse marine organisms and rich fish wealth and played a pivotal role in maintaining the maritime balance of the Sultanate throughout the ages.

However, with the passage of time, these gardens began to suffer from some environmental problems due to nets that are sticking in them and damages as a result of the traditional anchors of fishermen. All that has led to the loss of some luster of the marine gardens, disruption of its natural functions and decline in the role they play in maintaining the ecological balance of the marine environment. This foreshadows an environmental problem that needs to be addressed with all possible means.

Efforts of the environmental authorities in the Sultanate, efforts of the voluntary teams and the clubs to preserve the environment of coral reef, are visible, but remain incomplete if there is no clear cooperation by fishermen, fishing and diving enthusiasts to preserve this treasure that is buried deep in the marine environment. The sight of the fishing nets, which extend over long distances and cover the coral luster is very painful and cause sadness over the loss of this natural wealth. The view of the traditional anchors stuck in the middle of these reefs and lead to the cracking of large areas of them also predicts a real danger that threatens its virgin environment which may disappear over time.

This is our last environmental whisper to the community is to join forces in bringing back the glimmer of hope to these lush gardens, just because it is one of the most important natural marine environments in the Sultanate. It is a unique and diverse ecological treasure, which we have to preserve by various ways and means.

Scientific Study

Air Pollution Has Negatively Affects on Intelligence

A large-scale scientific study, on the relationship between air pollution and cognitive perception, suggests that long-term exposure to air pollution hinders the general cognitive performance of people, especially adults. The study, carried out by scientists from Peking University in China and Yale University in the United States, revealed that continuous exposure to air pollution impairs the ability of cognitive performance in speech and math tests. As people age, the negative effect on speech levels becomes very clear, especially for men, scientists said. The sample checked by the researchers included more than 25,000 people in 162 randomly selected provinces in China. The study was based on monitoring daily readings of three types of air pollutants spread in these districts where participants live.

The biggest threat

«Air pollution poses a major threat to public health,» said Thuraya Samawn of the United Nations Environment Program (UNEP). She stressed the importance of the study in uncovering what this pollution does to the brain, especially in adults. «Polluted air can reduce the level of education of a person a whole year backwards, and this is a huge decline,» said Professor Shi Chen of the Yale School of Public Health.

The scientists also concluded that damage to the brain caused by air pollution is likely to impose significant health and economic costs on individuals and society, and pointed out «the indirect impact on social welfare, which could be much larger than previously thought.»

According to the World Health Organization, seven million people die each year from exposure to polluted air and that the three most deadly diseases associated with it are stroke, heart disease, lung disease and cancer. The World Health Organization›s air quality database shows that 97 percent of cities in developing countries with more than 100,000 inhabitants do not meet the basic guidelines for air quality at present. However, the percentage is much lower in the cities of high-income countries.

The World Stands Against Air Pollution

A large global movement is now being formed to address the problem of air pollution. “Breathing Life” is a global campaign, led by the Climate & Clean Air Coalition, the World Health Organization and the United Nations Environment Program (UNEP). These organizations contributes to a number of Clean Air Initiatives that covering 39 cities, regions and countries, and affecting the lives of more than 80 million people.

Scientists warn

Global Warming Threatens Humanity by Awakening the «Black Death»

A professor at Oxford University warned that global warming could reawaken old diseases and even Black Death.

Professor Peter Frankopan said that, global warming would melt ice sheets that store buried bacteria for a long time, which could spread disease and cause new global pandemics. Francopane presented his predictions as part of the «Cheltenham Literary Festival», according to The Times.

The professor of world history began to express his opinion by saying: «There is absolutely no chance» of survival, because the international community will fall behind the goals of the Paris Convention in keeping the global temperature rise below 1.5 degrees Celsius”.

«If we go beyond this, it will not only concern the disappearance of the Maldives or the increase in migration, but about might happen when the permanent ice is removed and biological agents buried for thousands of years are released,» he said.

Because bacteria will once again be released into terrestrial ecosystems, there will be a high risk of untreated diseases for the world›s population.

The most important of these diseases, is the Plague, also known as Black Death and great death, which spread in the Middle Ages, due in large part to global warming.

According to Professor Francopane, such a possibility must be taken more seriously than sea levels or droughts, not least because Black Death killed between 75 and 200 million people in Europe in the fourteenth century.

Francopane›s predictions come amid an increasing number of studies looking at some of the indirect effects of global warming.

While Francophane›s warnings paint the worst-case scenario for future warming, there are recent examples of permanent melting of ice, which poses a major threat to people.

Development of a modern technique for extraction of polyphenols from seeds by a research team from Nizwa University

Due to Its Impact Positive in Maintaining Human Health

A new comprehensive study by the Department of Plants at the University of Nizwa revealed a new method that could provide better efficiency in the extraction of polyphenols from four seeds found in the Omani environment: basil, red seeds, sesame seeds and agar seeds compared to the traditional methods used in extraction.

Importance of polyphenols

Polyphenols are very effective substances, especially as polyphenols are are some of the most effective antioxidants. These materials gain the body›s optical and chemical protection, which prevents the effect of ultraviolet rays that harm the cells of the body. Polyphenols have many other health benefits that are important to the body. They help improve the lining of blood vessels and arteries. It helps in the production of nitric oxide, which improves the performance of the lining of vessels, which helps to prevent atherosclerosis. It also prevents the accumulation of blood plaques in the arteries and blood vessels, which prevents or helps to reduce the incidence of heart stroke,brain stroke, in addition to that, polyphenols help to protect the body from aging and its effects. Polyphenols are antioxidants, which purify the body›s cells from free radicals, whose oxidation inside cells destroys cells, but polyphenols purify cells from free atoms and thus maintain them, and helps in the growth of new cells. Polyphenols, for example, prevent the oxidation of low-density lipoprotein

Accuracy and Precision

The new design of experiment, combined with UV–Vis spectroscopy for polyphenols extraction from seeds, also has the advantage of acceptable accuracy and precision. This method is easier and cheaper to perform than

The study was jointly conducted by research scholars:

Fadal Mabood, Syed Abdullah Gilani, Javid Hussain, Sulaiman Alshidani, Said Alghawi, Mohammed Albroumi, Saif Alameri, Farah Jabeen, Zahid Hussain, Ahmed Al-Harrasi, Zahra Al Abri, Saima Farooq, Zakira Naureen, Ahmad Hamaed, Rasul Jan and Jasmin Shah.

These researchers are working in departments of:

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- Department of Chemistry, University of Malakand, KPK, Pakistan.

- Department of Chemistry, Abdul Wali Khan University, KPK, Pakistan

- UoN Chair of Oman Medicinal Plants and Marine Products, University of Nizwa, Sultanate of Oman.

- Institute of Chemical Sciences, University of Peshawar, KPK, Pakistan

cholesterol and thus prevent its deposition in the arteries, as deposition helps in the development of coronary heart disease. Polyphenols also help protect brain cells and nerve cells. In general, polyphenols protect against brain degenerative diseases, including Alzheimer›s, and polyphenols improve the condition of high blood pressure and lead to improved insulin resistance, thus improving the condition of diabetics.

In short, polyphenols are considered to be substances that have been systematically addressed in diets or even pharmaceuticals to reduce chronic diseases, improve metabolic rates, strengthen immunity, reduce stress, and fight obesity. Recent studies have shown that polyphenols Absorption of triglycerides with the disappearance of adverse effects.

Statistical approach

Due to the complex nature of metabolic processes, statistical approaches are used to get meaningful results from the raw data that are also used when the aim is to develop any method or product. One of the statistical tests applied on development of methods is design of experiments (DoE). In the design of experiments, generally, Response Surface Methodology (RSM) is applied that reduces time, efforts on number of experiments, and helpful in getting the optimum results.

A new statistical approach - design of experiments (DoE) for getting better results from raw data - was used to conduct the study on extraction and estimation of polyphenols from four different seeds – basil seeds, red seeds, sesame seeds and Ajwan seeds. New methods of extractions and quantifications will be required according to the nature of the seed and properties. In fact, not only the extraction methods and species variations that affect the extraction of total phenolic content but also the solvents have shown variable results.

The research Objectives

An important objective of the study was to optimise the extraction and quantification of total phenols in seeds of different plants species using Folin–Ciocalteu reagent (FC reagent) method. Response surface methodology was used to optimise the extraction parameters. The estimation of polyphenols was measured through phenols reduction UV-Vis spectroscopic method of phosphotungstic-phosphomolybdic acids

In the design of experiments, generally, Response Surface Methodology (RSM) was applied for reducing time, efforts on number of experiments, resulting in getting the optimum results.

Results of the Research

1. Basil seeds is the best source of antioxidant because it contains the highest amount of total phenols at 785.76 mg per 100 gram,

2. The sesame seeds have the least amount at 33.08 mg per 100 gram.

3. The Ajwan seeds and the Red seeds contain the medium amounts, which are 379 mg per gram and 220.54 mg per gram, respectively.

4. Plant polyphenols are secondary metabolites that may be extensively studied and used in different fields of studies such as chemotoxonomy, plant biochemistry and biogenesis.

5. There are reports of more than 8,000 polyphenolic compounds identified and isolated from plants sources. These compounds have been reported from all plants parts such as roots, stem, leaves, flowers, fruits, and seeds.

6. Plasma antioxidant capacity may be enhanced by using polyphenol-rich foods.

7. The seeds of various plants are considered as rich sources for total phenol contents.

8. Study of legume seeds such as chickpeas, field peas, faba beans, common vetch and lupins has shown that chickpeas had highest phenolic contents as compared to the other tested legumes.

high-performance liquid chromatography (HPLC) separation technique and do not require expansive reagents and organic solvents.

The study also found that though seeds are used in very small quantity in food, they are potential sources of antioxidants.

Sultanate launches environmental initiative to reduce the use of plastic bags

The Ministry of Environment and Climate Affairs launched the national initiative «Sustainable Lifestyle» at the Ministry of Environment and Climate Affairs, which is a continuation of its efforts to raise awareness and educate the community to preserve the environment and preserve its natural resources. Partnership and cooperation between government institutions, the private sector and civil society organizations in the Sultanate to conserve the environment in order to achieve sustainable lifestyles and reach the goals and objectives of the Global Plan for Sustainable Development 2030. To sensitize the society and its institutions to the importance of minimizing the use of plastic bags, the environmental impacts resulting from them, and finding appropriate and suitable alternatives, and promoting the culture of reuse and recycling of bags made from local environment materials during shopping. The initiative will promote the pattern and behavior of use among children and youth groups and encourage innovation in the use of materials Recycled through a range of activities and programs through the media, the press and social networks, and educational programs in schools, colleges, universities and shopping centres in all governorates of the Sultanate.

Qatar

Qatar plans to build electric cars factory

The first plant for the production of electric cars in the State of Qatar is planned to be built on an area of 6 sq km, with an estimated cost of about $9bn, which represents the total investment until the production of the first car.

Director of the Environmental and Municipal Studies Centre of the Ministry of Municipality and Environment Dr. Mohammed Saif Al Kuwari, stressed that the establishment of the first plant for the production of electric cars in the State of Qatar is one of the promising economic projects that support the national economy preserve the environment and achieve the Qatar National Vision 2030 and the National Development Strategy 2018 - 2022.

UAE

40 billion Dubai›s investment in the green economy

Dubai Electricity and Water Authority (DEWA) Chief Executive Saeed Mohammed Al Tayer said Dubai›s investment in green economy projects now stands at 40 billion dirhams and will reach 100 billion dirhams in 2030.

The UAE now ranks fifth in the number of green shippers. Dubai currently has 900 electric cars and 1,700 hybrid cars.

Bahrain

Ground water reserves in Bahrain have declined

Dr. Walid Zabari, a professor of water resources management at the Arab Gulf University, predicted that water resources in Bahrain will be greatly affected by climate change unless urgent action is taken to address the situation and adapt to changes. He said that there are many impacts expected to be caused by climate change on the resources of Bahrain, the most important increase in demand for water in the municipal and agricultural sectors because of high temperatures, and leakage of sea water to groundwater aquifers due to high levels of sea water, in addition to the decline in groundwater levels with the decline in rates Rainfall. The current water management systems in Bahrain are under severe pressure due to limited natural and financial resources and increased water needs as the process of social and economic development accelerates. He added that the increase in temperature will increase the rate of water consumption, which is currently corresponding to sea water desalination and pumping of groundwater, stressing that there will be a need to build more desalination plants to meet the quantitative and qualitative standards of water used for household purposes.

Saudi Arabia

Allocates 149 million for the initiative «environment»

The head of the General Authority for Meteorology and Environmental Protection Dr. Khalil Al-Thaqafi said that Saudi Arabia has allocated 149 million riyals to implement a specialized initiative in environmental awareness, within the initiatives of national transformation 2020, pointing out that the initiative aims to obtain data on the level of environmental awareness of society in Saudi Arabia in all its forms. He referred to the conversion of one case per month or every 60 days to the Public Prosecution because of violation of factories for the environment. He pointed out that the Commission deliberately refers all environmental violations of great and serious impact to the Public Prosecution in application of the system, in the event of completion of its judicial and environmental elements.

Kuwait

Environment Society conducts a questionnaire on sustainable development

The Kuwait Society for the Protection of the Environment (KPA) is conducting a questionnaire to determine the contribution of the programs of civil society organizations and the actions of individuals to the achievement of the goals of sustainable development. The Association invited civil society organizations and individuals in all Arab countries to participate in the questionnaire, In order to determine the awareness of biodiversity in Kuwait, the level of environmental awareness in the younger age group is measured

The discovery of the largest creature lived on earth 200 million years ago

Scientists have discovered a new species of giant dinosaurs that eat plants and lived 200 million years ago. The dinosaur bears the name «Ledumahadi mafube», meaning «giant thunder at dawn», in the Suti language, one of the official languages in South Africa. he beast was one of the «relatives» of the prentosaur or thunderbolt, twice the size of a large African elephant, weighing 12 tons and a height of 4 meters. Scientists say the dinosaurs were the largest living animals on Earth at the time, and may have had an «evolutionary experience». «The name of the dinosaur reflects the large size of the animal as well as the fact that its lineage has emerged in the origins of Serbian dinosaurs,» said paleontologist Professor Yonah Scheiner of the University of Witwatersrand in South Africa. Researchers estimate that the dinosaur was asleep when it died, and scientists were able to accurately determine the age of the animal, estimated at 14 years, by looking at the growth rings in the fossil bone tissue. «By looking at the skeletal structure of the animal, we were able to see that it quickly grew into adulthood,» said Dr. Jennifer Buta Brink of the National Museum of South Africa in Bloemfontein. The growth cycles shown at close distances show that the growth rate has decreased significantly with the time the dinosaur died. Dr Brink says this indicates that the animal has

Archaeological sites may disappear from the map of the world

Scientists warned that many of the scenic sites overlooking the Mediterranean, which attract tourists from around the world, may disappear completely in the future, being vulnerable to destruction by natural disasters caused by climate change. A team of academics led by Lena Riemann of the University of Kiel in Germany has created a database of all UNESCO Mediterranean sites at risk during the next century due to flooding or «erosion of the coast» using mathematical models to predict how sea level rise affects them. The study included fascinating sites such as the Italian city of Venice, Floating, the Amalfi Coast of Italy, and Piazza del Duomo, the most important square in Italian Pisa. The researchers found that out of 49 coastal sites around the Mediterranean, only two would be safe from flooding or coastal erosion by 2100. More than three-quarters (37 sites) are vulnerable to severe flooding by 2100, the Daily Mail reported. Piazza del Duomo in Pisa is the only site at risk of flooding, while 90 percent of sites will face the threat of coastal erosion by the end of the century (42 sites). It will face the risk of coastal erosion only, such as the Greek island of Rhodes, the Tunisian city of Sousse,

Bacteria can neutralize the risk of radioactive waste

Scientists in Russia have discovered bacteria in deep storage places for radioactive waste, which under certain conditions can reduce the migration of radionuclides and can be used to create a natural barrier. «Since the 1980s, the world has been paying close attention to microbiological studies in the storage areas of radioactive waste and radiation-contaminated areas,» said an article in the journal «Radioactive Waste» published by the Institute for the Safe Development of Atomic Energy of the Russian Academy of Sciences. A Russian scientific team, consisting of experts from a number of Russian research institutes and research centers, conducted a microbiological study of groundwater in the Severski region, where radioactive waste is stored for Ross Atom. In this study, the scientific team used molecular genetics techniques and discovered in the ground water bacteria capable, under certain conditions, of converting the radionuclide ions (nuclei of fissionable elements), including uranium and plutonium, into stable forms, preventing their spread. After that, scientists conducted laboratory experiments to determine these conditions. The results obtained by the scientific team suggest that this method allows for the formation of a biogeochemical barrier for radionuclides when closing deep spaces to store liquid radioactive waste.

Environmental Vocabulary

The Dumb Clown

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We suddenly stop when we see it emerging from the surface of the sea with its super-beauty, waving its body to the fresh air with its bright temperament. Its scene paints a smile on our face, and gives our hearts pleasure and joy. It comes out of the water to breathe the air and then returns back to where it came. From Its movements we can derive its unusual intelligence, and its actions reveal to us its kindness that much like humans to a certain extent. From where we start and to where we end, describing it as a wonderful animal is above than what was described.

Living in the sea in groups that sometimes reach to hundreds, homogeneous with each other of all ages and categories, communicate between them in a system of communication through which they salute each other exactly like humans, and have a radar system like Sonar system through which they can identify the danger. According to the their ecosystem, they are loyal to each other, when one of them is sick, not left alone, but is surrounded by care and protection from the team until die. Behave intelligently, and solve their complex problems wisely. Its appearance from the world of water to the world of air is a renewal of life. Filling its individual lung with air with a voluntary breathing is unique among other creatures of the universe, so it sleeps and one eye is open and part of its brain in full attention to avoid nap and lose control of breathing. Its sleep means its death. The baby dolphin has a one-year breastfeeding period after settling in its mother›s womb for 11 months and having sexual maturity almost three years after birth. After which it can enter the reproductive stage until 30-year life span. .

Dolphins share their food along with tuna fish to feed on sardines and others. Fishermen may sometimes be aware of the presence of tuna from dolphin's location. There are about forty species of dolphins in the world, some live in fresh water. The Sultanate›s beaches adorn ten species of dolphins, dazzling us with their acrobatic movements and aerobics jumps, most prevalent the spinner dolphin.

Fishermen›s nets are one of the most threatened dolphins. In additionto that is the destruction of their habitats by the erosion of the coasts, as well as the pollution of their food. To reduce the threats, there are strong efforts to protect and preserve dolphins. The dolphin is of an aquatic world, mammal like wild mammals, and intelligent as humans. It gained many valuable behaviors, as if it is picking a flower from each orchard. Let us all protect this cute animal, and cover it with cloth of care even in simple way.

WILD CAT

By: IFtikhar AlBadawia