



## MIDDLE EAST, NORTH AFRICA WATER CRISIS MUST BE TOP OF THE AGENDA AT COP28\*

CALLING FOR A NEW ERA OF REGIONAL COOPERATION, BOLSTERED BY WOMEN'S LEADERSHIP

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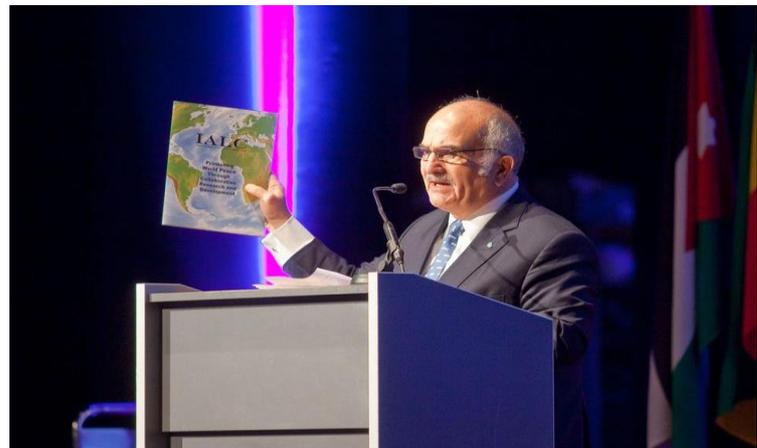
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Water is life - yet the water crisis in the Middle East and North Africa continues to worsen without a viable solution in sight.

At the Conference of the Parties of the UNFCCC (COP28) in Dubai, we must come together and create a concrete, realistic, and consensual roadmap for the cooperative and productive management of water resources. This roadmap must be part of broader regional and international frameworks that save lives, increase equity, and ensure communities across the Middle East, North Africa -and the world- are able to adapt to climate change.

### A tipping point

Although we have been facing a water crisis for years, the situation is becoming more severe, exacerbated by sustained climate change-induced droughts and extreme heat. Jordan is the second-most water scarce country in the world, following only Somalia. Among myriad water shortages across the region, discharge from the Euphrates River in Iraq and Syria dramatically dropped this year, Iran's Lake Urmia is almost dry, and Egypt is facing severe water scarcity.



Most major groundwater sources in the region cross borders. A transboundary crisis of this magnitude requires a new era of regional cooperation, where we move from resource competition to resource sharing, looking beyond the expediency of myopic political decisions in the interest of long-term resilience.

### We're in this together

COP28 presents a perfect opportunity to commit to widespread water citizenship — fair ownership and loyalty toward water sources and infrastructure, the wise use of water resources, and the joining of efforts to achieve equitable access to water. For water citizenship to work, we must constantly measure and assess the state of our water supply. That's why we need regional research hubs for collecting and sharing data, and translating science into evidence that can be applied by policymakers to develop smart water management policies.

Water is inherently linked to the conservation and management of energy, food, and entire ecosystems. Governments, academia, and international organisations must arrive at an evidence-based, shared understanding of these environmental concerns to develop integrated solutions. The Water, Energy, Food, and Ecosystem Nexus regional community of practice

\*Source: <https://www.khaleejtimes.com/kt-network/middle-east-north-africa-water-crisis-must-be-top-of-the-agenda-at-cop28>

established by the Islamic Network on Water Resources Development and Management, which works on converting and merging science, technological, and industrial innovations into real-life improvements for citizens, is a great step in that direction.

### **Water – A women’s issue**

Water is everyone’s concern, but its accessibility has direct and specific impacts on the health and well-being of women and girls. Women are most of the world’s food producers and are on the frontlines of caring for their families. This means they are often charged with ensuring water is in supply.

When there is no immediate access to water, girls miss school to fetch water for their families, and women’s time is usurped by water collection, hindering them from keeping a job. On their journey for water, they may be subjected to sexual and gender-based violence. Without potable water, their children can become sick from waterborne illness or malnourished without access to sufficient food.

Lastly, when there is too much financial hardship, girls pay the price. According to the last Sustainable Development Goal report, 110 million girls are likely to become child brides by 2030.

It is widely agreed that women’s prosperity drives healthier, more peaceful societies. We must account for the needs of women when we develop solutions and involve them in decisions about policies and programmes that will inevitably have a huge effect on their lives. We must have more women around the decision-making table at COP28 and beyond.

### **Resilient health systems**

While we work on putting in place solutions, we recognise that a crisis is already upon us. The water crisis and climate crisis as a whole demand that we strengthen health systems to address the many detrimental effects of climate change on health. It is critical that health systems remain resilient and ready to serve communities through shocks and stressors. Health clinics must have disaster preparedness plans in place and means to implement them. Depending on the context, these may include extreme heat protocols, strategies to address a rise in waterborne and vector-borne diseases, and ensuring essentials like backup power and water supplies, a surplus of medicines, and different modes of emergency transport.

### **A locally led, women-led solution**

A great example of a program that does it all — empower women while strengthening health systems and responding to climate change — is led by Pathfinder International in Egypt. The programme transforms health clinics into “green” clinics that adopt environmentally friendly practices like water conservation, green waste disposal, and use of solar panels, while training health providers to combat the health risks of climate change. At the same time, women are supported to engage in eco-friendly businesses and act as “ambassadors of change” who mobilize for climate action in their communities. This work is led by local organizations who have the trust of communities and can play a significant role in sustained climate change mitigation and resilience initiatives.

### **Future at stake**

A failure to address the water crisis and the climate crisis more broadly will inevitably result

in regional conflicts over water, significantly hindering health and development and threatening the viability of entire nations. Changes in policy and strategy are needed locally, regionally, and globally to safeguard the futures of generations to come. Without drastic action today, climate change adaptation will be more difficult and costly tomorrow, and in our lifetimes, we will see multitudes of people without access to water — the most essential of all lifelines.



*Water is inherently linked to the conservation and management of energy, food, and entire ecosystems - Reuters file photo.*

## ENVIRONMENT AND DEVELOPMENT IN THE ISLAMIC WORLD

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UNESCO has been working to address the questions of environment and development for many years. UNESCO mandate in education, science, and culture and communication, has enabled it to promote an integrated approach to understanding these problems.

Scientific research is the starting point in the continuum of training and education. Interdisciplinary research can deal with "real-world" problems. Researchers in natural sciences-ecology, biology, hydrology, oceanography and social sciences-economics, anthropology-at both the basic and applied levels need to become equal partners for dealing with the complexity of sustainable development problems.

The transdisciplinary approach between non-governmental and intergovernmental organizations and the private sector ensures participation and the utilization of results. This may be accomplished through networks among researchers in various institutions. No one country has the human and financial resources to cope with the complexity of global sustainable development. Long-term and short-term research represent an investment in lasting solutions and ensures that modern technologies can help in minimizing environmental impacts while maximizing the developmental outputs. The results of scientific research should not be restricted to the academic world. Successful research must contain a communication

component which may yield a policy and action oriented framework or future technologies. There is a gap between researchers and decision-makers. Often, researchers are ineffective in communicating their conclusions in a non-technical and policy-oriented style.

Building an environmentally stable future requires vision. A sustainable society is one that satisfies its needs without jeopardizing the prospects of future generation. There are no existing models of sustainability. For the past several decades, automobile-centred, fossil-fuel driven economics of the industrialized West has brought about a global threat of climate change. It is now clear that those societies are rapidly bringing about their own demise.

For the world to retrieve sustainability, it has to be done within the next 10 years, otherwise environmental degradation and economic decline are likely to feed each other leading to social disintegration. So our vision of the future looks to the year 2030.

According to current United Nations projections, the world is heading towards a population of nine billion people by the year 2030. Most of this population increase will take place in those countries where human numbers are already overtaking the natural support systems. It is estimated that of the extra billion people, 900 million will be in the developing countries. The humane path to sustainability by the year 2030 requires smaller-sized families; otherwise rising death rates from hunger and malnutrition will check population growth.

Efforts to improve human well-being must tackle the problem of poverty: 1116 million people are officially defined as poor, and 630 million as very poor. The world's richest billion people consume the most resources and generate the most waste; the world's poorest billion are producing the most children in the world, and almost all condemned to join the ranks of the people defined as poor or very poor. Poverty is already on the increase now as compared to the 1960s.

Sustainable investment and resource use could bring environmental issues to the stage of

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economic policy formulation. The challenge is to couple ecosystem requirements to the market place and build economies that stimulate sustainable investment and resource use. However, many environmental problems whether be soil erosion, deforestation, desertification, accumulation of greenhouse gases, pollution of water resources, destruction of biological diversity or ozone depletion, for example-emerge from investment decisions made some 30 or 50 or more years ago. This means that even if we take action today, overcoming the cumulated problems will need a considerable period of time.

For all people to reach a lifestyle, say, equal to the present experienced by OECD countries, a five-fold increase in the state of resource consumption would be necessary. By 2050, a ten-fold increase would be required. To achieve this target for example without increasing the present level of pollution, global waste emission would have to be reduced by 90%. So, if the Brundtland report suggests that most people can escape poverty, then a rapid transition to a new economic order is essential. An order where investments have to be coupled to essential and decoupled from environmental degradation. To define "sustainable development" one has to examine the "3 Es":

- (a) Maintain Environmental integrity
- (b) Pursue Economic efficiency
- (c) Pursue Equity, to include present and future generations, and to recognize cultural and social dimensions.

To achieve these objectives, a broad mixture of policy instruments must be used. Prices should reflect not only the economic costs, but also the environmental costs. Market-economies have failed so far in reflecting environmental truths. The clean-up which is taking place by governments is costing the tax-payer a very high price. The depletion of the ecological capital "the ecosystem" has to be calculated and to be paid in full, so prices should reflect the environmental costs and the "polluter pays principle". This is why it is high time for the third world to ask the industrialized countries for the "ecological debt" to be used in a swap and as an exchange for solving the foreign hard currency debt crisis of developing countries.

There has been in the last decade a net transfer of resources from developing countries to industrialized nations. This is nothing less than a blood transfusion from the sick to the healthy (Brundtland).

Sustainable development for the developing countries requires access to world markets. The General Agreement on Tariffs and Trade (GATT) failed to offer satisfactory conclusions. Developing countries have to expand and liberalize their economics and diversify their exports away from over reliance on primary products. Protectionism has to be resisted and multilateral co-operation must prevail.

By the onset of the 21<sup>st</sup> century, heavily indebted countries could no longer service their debts. As the crisis grew, creditor banks found themselves holding increasing volumes of "non-performing debts". Banks have the choice of discounting their holdings, thereby retrieving something of their value, or retaining them and more likely watching them devalue totally.

Debt for nature exchanges are basically straight forward. In essence the foreign- currency debt holder negotiates a deal whereby the debtor redeems the debt through commitment either to invest local currency in conservation and natural resources or encourage sustainable development through changes in policy and regulations. An agreement is reached allowing the investor to exchange some of the foreign currency debt to local currency or government bonds to be used for agreed activities. To avoid the risk of accusations of foreign intervention in national affairs, or the misuse of funds, the debt for-nature projects may be coordinated by local NGOs or trusted institutions in the debtor country.

Madagascar (with high rainfall and little seasonal change) is the site of over 60 million years of evolution of a diverse array of species found nowhere else in the world. In Madagascar, debt-for-nature exchanges are now in place. The proceeds in which World Wildlife Fund (WWF) is the investor, will be used to protect and manage high priority areas, to train staff, equip and support 400 parks and UNESCO natural heritage sites and encourage sustainable agriculture and fuelwood projects.

# GALAXY FORMATION AND EVOLUTION

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**Abstract:** The text treats the role of quantum fluctuations as the source of density fluctuations in the universe for the formation of stars, the collapse of dust clouds with different densities, leading to the formation of elliptical and spiral galaxies, and their evolution, and the formation of the chaotic and structureless irregular galaxies from these galaxies.

## 1. Introduction.

The study of galaxy formation and evolution deals with the processes that led to a heterogeneous universe from the initial homogeneous one after the Big Bang explosion and after the first sec of this event, the  $10^{-32}$  sec-period inflation causing an exponential expansion of its size by a factor of around  $10^{26}$ , the formation of the first stars and the first galaxies, the way galaxies have evolved over time, and the processes that have generated the variety of structures observed in the nearby galaxies.

## 2. Quantum fluctuations and gravitational instability.

After the inflation caused homogenizing universe expansion, due to the uncertainty principle, quantum fluctuations persist rendering it heterogeneous. In an expanding universe dominated by non-relativistic matter these quantum fluctuations caused perturbations will grow with time, because a region whose initial density is slightly higher than the mean, will gravitationally attract its surrounding slightly more strongly than the average. As a result, the over-dense regions pull matter towards them and become even more over-dense, but the under-dense regions become even more rarefied as matter flows out from them. This amplification of density fluctuations has been called gravitational instability and plays an important role in the modern theories of structure formation such as stars and galaxies.

## 3. Kennicutt-Schmidt law of star formation.

In astronomy, the Kennicutt-Schmidt empirical law of star formation from dust in galaxies (1) proposed that

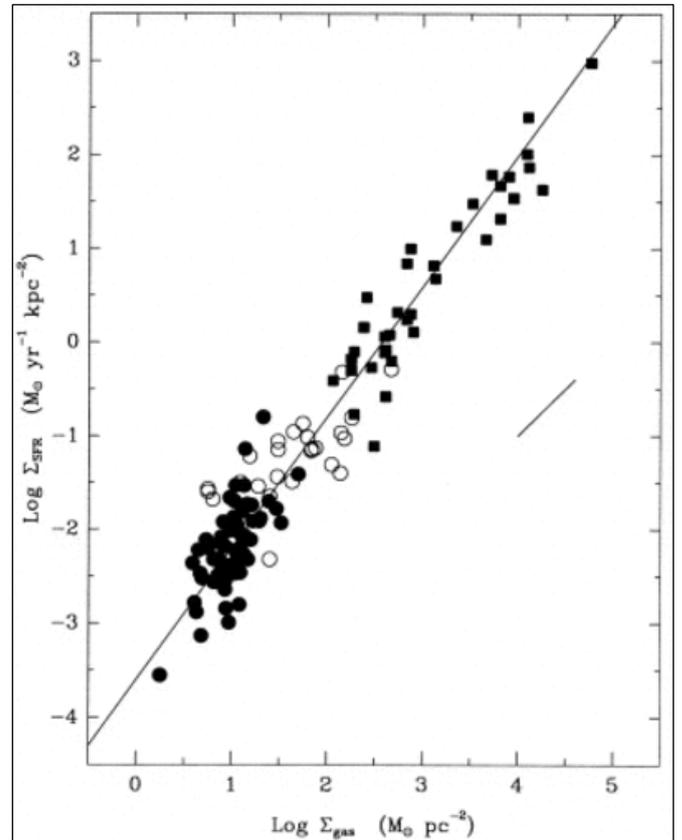
the star formation rate  $\Sigma_{\text{SFR}}$  depends on the local surface dust (gas) density  $\Sigma_{\text{dust}}$  as:

$$\Sigma_{\text{SFR}} = a (\Sigma_{\text{dust}})^n, \quad (1)$$

where  $\Sigma_{\text{SFR}}$  is in units of solar masses per year per square parsec ( $M_{\text{Sol}} \text{ yr}^{-1} \text{ pc}^{-2}$ ), and  $\Sigma_{\text{dust}}$ , the surface dust (gas) density in grams per square parsec ( $\text{g pc}^{-2}$ ). The latest values (2) of the formula's constants  $a$  and  $n$  are:

$$a = (2.5 \pm 0.7) \times 10^{-4}; \quad n = 1.4 \pm 0.5 \quad (2)$$

Fig. 1, shows the Kennicutt-Schmidt law based fit to the gas-density data on a log-log scale (4).



**Fig. 1.** The Kennicutt-Schmidt law based fit to the gas-density values (4).

As a function of mass, there is a large variety of stars in the universe such as the different types of dwarf stars, neutron stars, gluon-quark plasma stars, stars of non-interaction quarks and gluons as black holes, and many others with their specific characteristics.

## 4. Formation of galaxies.

Galaxies are a huge collection of gas, dust and billions of stars and their solar systems, all held together by gravity. There are between 100 billion and 200 billion galaxies in the observable universe, and an estimated total number of 2 trillion galaxies in the universe.

The generally accepted idea about the formation of galaxies is that they form from the collapse of gas clouds into stars. The difference between elliptical and

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spiral galaxies reflects the rapidity of star formation during the collapse. If most of the gas turns into stars as it falls in, the collapse is effectively dissipationless and the infall motions are converted into the random motion of stars resulting in an elliptical galaxy. However, if the cloud remains gaseous during the collapse, the gravitational energy can be dissipated via shocks and radiation cooling. In this case, the cloud will shrink until it is supported by angular momentum, leading to the formation of a rotationally supported disk and finally to a spiral galaxy. For the elliptical galaxies, the rapidity of star formation during the cloud collapse suggests that the dust (gas) density of the clouds should be higher than the density of clouds for the spiral galaxies. As to the big galaxies, they may be formed from big gas clouds or through merging with the relatively small galaxies. Moreover, the presence of dark matter with its gravitational field may also play a helpful role in the formation of these galaxies, the galaxy clusters and the cluster ribbons.

## 5. Three types of galaxies.

### a. Elliptical galaxies.

The elliptical galaxy has a nearly ellipsoidal shape and is smooth and nearly featureless. It is composed of older low mass stars with low interstellar medium and a minimal star formation activity. These galaxies are generally surrounded by a large population of globular clusters. They are not the dominant type of galaxy in the universe as they make up about 10 – 15 % of all the galaxies. Every massive elliptical galaxy has a supermassive black hole at its center. These galaxies are without much structure and their stars are somewhat in random orbits around the center. Fig. 2, shows the Messier 49 giant elliptical galaxy.



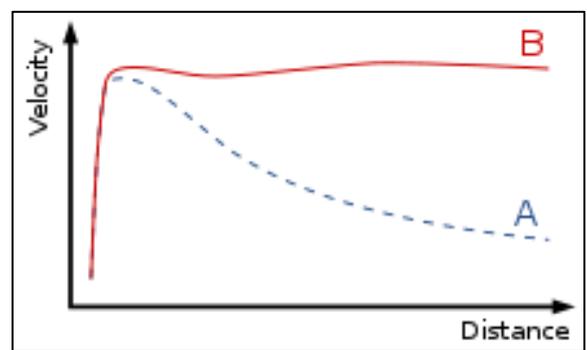
**Fig. 2.** Messier 49, giant elliptical galaxy (3).

### b. Spiral galaxies.

Most of the spiral galaxies contain a central bulge surrounded by a flat rotating disk of stars. The bulge in the center consists of older and dimmer stars and is thought to contain a supermassive black hole. The disk of stars orbiting the bulge separates into arms that

circle the galaxy. Unlike the elliptical galaxies, the spiral arms are rich in gas and dust (interstellar) and young stars. According to the current estimates, the spiral galaxies are the most dominant and make up about 60 -70 % of all the galaxies.

The structure of spiral galaxies helps to measure the rotational velocity of the stars made of visible or baryonic matter, as a function of their distance from the center of the galaxy. Normally, this rotational velocity should decrease with the distance as shown by curve A in Fig. 3. However, the velocity remains *flat* as a function of distance as indicated by curve B in Fig. 3, indicating the presence of an invisible matter, now, called black matter that does not interact with the electro-magnetic field but is the source of gravitational field like the ordinary visible matter. There is an intense international effort to experimentally confirm the existence of dark matter as different hypothesized particles such as WIMPs and axions, but still without any indication. However, dark matter per se is already an integral part of the cosmological model  $\Lambda$ CDM.



**Fig. 3.** Rotation curve of a typical spiral galaxy: Predicted (A) and observed (B). Dark matter can explain the 'flat' appearance of the velocity curve out to a large distance from the galactic center (3).

Fig. 4, shows the photo of Messier 74 spiral galaxy with the rotating disk of stars.



**Fig. 4.** The Hubble Space Telescope photo of Messier 74 spiral galaxy with the rotating disk of stars. (Image credit: NASA/ESA/Hubble Heritage Team).

Concerning the evolution of spiral galaxies, they are thought to evolve into elliptic galaxies as they get older.

### c. Irregular galaxies.

An irregular galaxy does not have a distinct and regular shape. They are often chaotic in appearance without nuclear bulge or a trace of spiral-arm structure. Some of the irregular galaxies were once spiral or elliptic galaxies but were deformed by an uneven external gravitational force. The irregular galaxies may contain abundant amounts of gas and dust (interstellar). These galaxies are small. Due to their small sizes, they are prone to environmental effects like colliding with large galaxies and intergalactic clouds. They make up about 15 - 30 % of all galaxies.

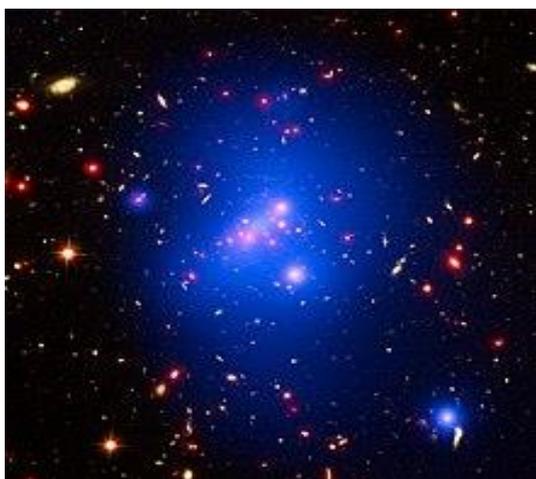
Fig. 5, shows the photo of an irregular galaxy.



*Fig. 5. NGC 1427A, irregular galaxy, (3).*

### 6. Galaxy clusters.

A galaxy cluster is a structure of hundreds to thousands of galaxies bound together by gravity. They have a total mass of  $10^{14}$  to  $10^{15}$  solar masses. Fig. 6, shows the galaxy cluster IDCS J1426.



*Fig. 6. Galaxy cluster IDCS J1426 is located 10 billion light-years from Earth and has the mass of almost 500 trillion suns (3).*

### 7. Galaxy filaments.

Galaxy filaments are the largest known structures in the universe consisting of walls of gravitationally bound galaxy superclusters. These massive thread-like formations can reach  $80 \text{ megaparsec } h^{-1}$  and form the boundaries between large voids. Fig.7, shows the artist's rendering of two string-like filaments of galaxies.



*Fig.7. Artist's rendering of two string-like filaments of galaxies (3).*

### 8. Conclusions.

The text treats the role of the uncertainty rule-caused quantum fluctuations as the source of density perturbations in the universe for the formation of stars, the collapse of dust (gas) clouds with different densities, leading to the formation of elliptical and spiral galaxies, and their evolution, and the formation of chaotic and structureless irregular galaxies from these galaxies.

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# TECHNOLOGY OF IRAQI PALM AND DATES USING LABORATORY EQUIPMENT APPLICATIONS TO EXTRACT OILS FROM IRAQI SEED DATE PALM (*PHOENIX DACTYLIFERA L.*)

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## Introduction

Date palm or Palm dates *Phoenix dactylifera*, L. (belonging to the Plantae plant kingdom, angiosperms Magnoliophyta, monocotyledonous species (Liliopsida according to the Croquist system) Liliopsida, palmaceae order Palme, Arecaaceae family, Date palm *Phoenixyl palm Phoenixact.* is one of the oldest fruit trees in the World. This family includes about 220 genera and the order of palmaceae Palme is one of the largest and most important plant orders known to man [1,3].

Palm cultivation is widespread in tropical, subtropical and subtropical regions, and the cultivation of date palms has historically been associated with the Arab East. Iraq is considered the ancestral home of date palms; especially the region of the Shatt Al-Arab river (formed by the confluence of the confluence of the Tigris and Euphrates) and the northern coast of the Persian Gulf and from there expanded its range to areas with favorable and suitable conditions and climate [3]. The date palm is one of the most important evergreen trees fruit trees that belong to monocotyledonous and dioecious monocotyledon.

Palm trees occupy an important place in human life, especially in hot and dry areas, since their fruits are a high-energy source of food, as well as an industrial, commercial and agricultural resource.

Mankind has known palm trees for more than 4000 BC. The Babylonians and Assyrians attached great importance to them; they were sacred to the Sumerians and are considered one of the main industries of many inhabitants of the Middle East [9]. Palm fruits contain a high percentage of sugar (44-88) %, fat (0.2-0.5%), protein (2.3-5.6)%, 15 types of mineral salts and vitamins and a large amount of fiber (6, 4-11.5%) [9].

Iraq occupies an important place in the production of dates among countries - producers of dates in the

number of palm trees and varieties, which reaches more than 600 varieties and is led by the variety Zahidi, which accounts for 70% of the total production of dates [9]. In addition to economic the importance of dates and their products (dates) date kernels are used as feed, food and fuel [10]. Fruit growth and maturity are observed at five different stages: the stages of Al-Khababuk (ovary), Al Jamri (Green phase), Al Hillal (splitting), Ar-Rutab (moisturizing) and the stage of formation of the date fruit itself, and depending on the color, freshness, humidity and sugar content of more than 30.5% dates are considered fully ripe [10].

## Objective of the Study

Study the physical properties of the studied fruits of the Iraqi varieties of date palm (*Phoenix dactylifera L.*) at the stage of the mature date fruit. Length (cm), Diameter (cm), Volume (cm<sup>3</sup>), Weight of the fruit (g), Weight of seeds (g), Weight of the fleshy part (g).study Chemical analysis of the grinding properties of seeds of Iraqi varieties of date palm (*Phoenix dactylifera L.*) Moisture, Ash, Proteins (proteins), Oil, Carbohydrates. Use of local Iraqi dates as a food source for Iraqi date palm varieties (*Phoenix dactylifera L.*) such as Zahdi Halawi and Sayer.



Picture 1. Laboratories Seed Oil Extraction Iraqi Date Palm.

## Materials and Methods

Three varieties of the date fruit *Phoenix dactylifera L.* were selected for the study (Zahdi, Hilawi, Sayer) at the bean stage. Hilawi date variety was collected from one of the gardens in the Al Kharis area in the northern part of Basra, Sayer date variety was collected from one of the Abu Khasib gardens in Al Basra province, while Zahdi date variety was collected from one of the gardens of Avasha area in the southern part of Al Ammar. These varieties were selected from vigorous trees based on their maturity, freshness, uniformity and disease clearance, similar sizes, low cost and availability in the market. The seeds (pits) were cleaned and isolated manually, thoroughly washed with distilled

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water and were left for drying up for 10 hours at the temperature of 25 °. The dried pits (seeds) were grinded in a Chinese grinding machine (High-Speed

Grinder SIZE 750 G). To get the date seeds grinded powder, the contents were stored in sealed plastic bags at 4-5 ° C prior to the start of their usage.



*Picture 2 - Photographs of Date Palms of the Variety Iraqi Date Varieties Zabdi, Hilawi, Sayer (Phoenix dactylifera, L. Iraq - Maysan City.*



*Picture 3 - Photo of the seeds preparation for grinding.*



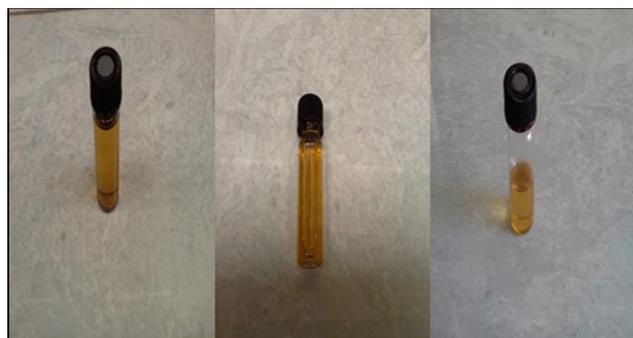
*Picture 4 - Photo of Iraqi dates powder (Powder of Zabdi date seeds).*



*Picture 5 - Photo of Iraqi dates powder (Powder of Hilawi date seeds).*



*Picture 6 - Photo of Iraqi dates powder (Powder of Hilawi date seeds).*



*Picture 7 - Date seed oil.*

## Results and Discussion

**Physical properties of the studied and studied varieties of date palm.** (Table 1). shows the physical characteristics of the date palm fruits (Zahidi, Halawi and Sayer) at the date stage. It was noted that three varieties differed in length characteristics (2.97, 3.38, 3.29 cm), respectively, the diameter reached (2.22, 1.50, 1.70) cm, respectively. As for the dimensional characteristics, they showed a noticeable difference between the varieties and reached (8.98, 5.55, 4.98)

cm<sup>3</sup>, respectively. The results showed that the weight of the whole fruit of the varieties of Zahidi, Halawi and Sayer was (7.97, 5.94, 4.81) g, respectively, with regard to the weight of seed seeds, it was (0.95, 1.09, 0.85) g for three varieties respectively. The weight of the meaty part of the varieties of Zahidi, Halawi and Sayer (7.07, 4.94, 3.93 g), respectively. And this result is approximate to what was obtained [4]. For the variety Zahidi when he reached the weight of the fetus (7.80) grams.

**Table 1. Physical properties of some date palm Iraqi -varieties.**

Properties	Varieties		
	Zahdi	Hilawi	Sayer
Length (cm)	2.97	3.38	3.29
Diameter (cm)	2.22	1.50	1.70
Volume ( cm <sup>3</sup> )	8.98	5.55	4.98
Fetal Weight (g)	7.97	5.94	4.81
Seed Weight (g)	0.95	1.09	0.85
Weight of fleshy part (gr)	7.07	4.94	3.98

## Chemical analysis of the grinding of dates seeds for the varieties of dates fruits studied in the work.

(Table 2). explains the chemical analysis of the date seed grinding for the date fruit varieties studied in the work (Zahidi, Halawi, Sayer) for the moisture content, which turned out to be the following (4.80, 4.70, 6.50)%, respectively, among these varieties. We notice an increase in the moisture content in the Al-Sayer cultivar, followed by Zahidi and at the end of Halawi. These results are close to those that have been achieved [10]. (4.67, 4.68)% for Zahidi and Halawi, and also came to them [10]. (6.46%) for Sayer variety. The reason for this difference lies in the physiology of the presence of water in the food product, when there remains an unevaporated part of the water [10]. Either because of the ability of the powders to absorb the amount of moisture from the outside air when opening the containers during the analysis, or because of the

vapor pressure deficiency Vapor Pressure Deficit (VPD), which is the difference between the pressure of water vapor inside and the pressure of water vapor outside and therefore, the spread of water vapor in a vessel. [10].



*Picture 8 - Laboratories Seed Oil Extraction Iraqi Date Palm.*

**Table 2. Chemical properties of some date palm Iraqi varieties.**

Properties	Varieties		
	Zahidi	Halawi	Sayer
Humidity	4.80	4.70	6.50
Ash content	1.20	1.18	1.14
Proteins	5.31	6.70	5.30
Oil	8.17	8.13	8.50
Carbohydrates	80.70	80.22	79.80

# ANTICANCER POTENTIAL OF BIOACTIVE COMPOUNDS OF *ORIGANUM SYRIACUM*: PHARMACO-MOLECULAR MECHANISM OF ACTION IN BREAST CANCER

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and Elias Baydoun<sup>3</sup>

## **Overview**

Breast cancer is the second most common cancer in the world as well as one of the major contributors to cancer-related mortality in women. Triple negative breast cancer (TNBC) is an aggressive type of tumor, associated with the lack of three receptors that are primary targets of major chemotherapeutic agents. This makes TNBC relatively resistant to various treatment regimens and hence associating it with poor prognosis. This mandated that other alternative approaches like herbal medicine be sought and given increased recent attention. Indeed, several phytochemicals, plant-derived compounds, have been identified and used by virtue of their antioxidant, anti-inflammatory, and anticancer effects. Relevantly, *Origanum syriacum*, commonly known as Za'atar, is a plant that possesses antioxidant and anticancer potential. However, the mechanism by which this herb modulates the malignant phenotype of TNBC cells, such as MDA-MB-231 cells, remains poorly investigated. Here, we tested the effect of *Origanum syriacum* crude leaf extract on MDA-MB-231 cells. Moreover, we tested its anticancer potential against another aggressive cancer *in vitro* using Capan-2 pancreatic cancer cells. Finally, we carried out bioguided fractionation of the crude extract in an effort to purify the mixture and isolate compounds responsible for the observed anti-proliferative effect.

## **Results**

### ***Investigation into the anticancer potential of Origanum syriacum ethanolic crude extract (OSEE).***

We demonstrated that OSEE had potent radical scavenging activity *in vitro* and induced the generation of ROS in MDA-MB-231 and Capan-2

cells, especially at higher OSEE concentrations. Non-cytotoxic concentrations of OSEE attenuated cell proliferation and induced G0/G1 cell cycle arrest, which was associated with phosphorylation of p38 MAPK, an increase in the levels of tumor suppressor protein p21, and a decrease of proliferation marker protein Ki67. Additionally, only higher concentrations of OSEE were able to attenuate inhibition of proliferation induced by the ROS scavenger N-acetyl cysteine (NAC), indicating that the anti-proliferative effects of OSEE could be ROS-dependent. OSEE stimulated apoptosis and its effector Caspase-3 in MDA-MB-231 cells, in correlation with activation of the STAT3/p53 pathway. Furthermore, the extract reduced the migration and invasive properties of MDA-MB-231 cells through the deactivation of focal adhesion kinase (FAK). OSEE also reduced the production of inducible nitric oxide synthase (iNOS) and inhibited *in ovo* angiogenesis.

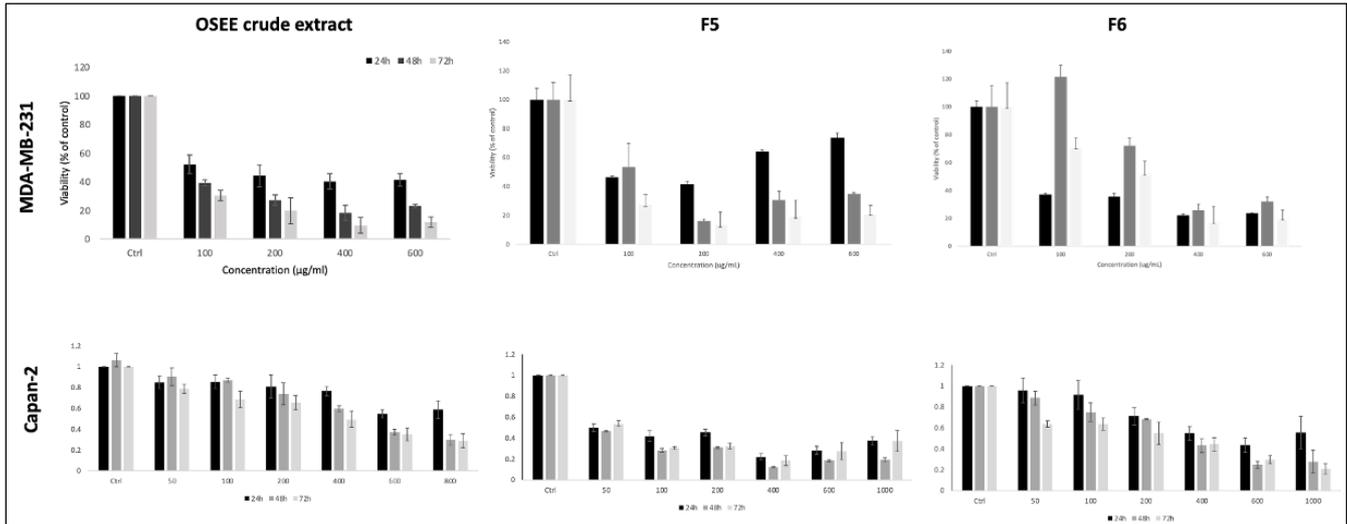
### ***Bio-guided fractionation of Origanum syriacum ethanolic extract and isolation of active components based on their antiproliferative property.***

We screened and fractionated the ethanolic extract of *O. syriacum* leaves (and investigated their anticancer potential *in vitro* against the highly aggressive MDA-MB-231 breast cancer cell-line as well as the Capan-2 pancreatic cancer cell line. Interestingly, we found that one of two fractions (F5 and F6) showed enhanced antiproliferative activity, compared to the crude extract (Figure 1). The composition of the fractions is being further investigated and analyzed by liquid chromatography.

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**Figure 1.** *O. syriacum* crude extract and fractions inhibit the cellular proliferation of MDA-MB-231-cells. MDA-MB-231 and Capan-2 cells were treated with increasing concentrations of the indicated extract (OSEE, F5, and F6) for 24, 48 and 72 hrs. Cell viability was determined using the MTT assay. Values are expressed as % of the control and are represented as the mean  $\pm$  SEM of three independent experiments.

## Conclusion

Our findings reveal that OSEE is a rich source of phytochemicals and has robust anticancer properties that significantly attenuate the malignant phenotype of MDA-MB-231 and Capan-2 cells, suggesting that *O. syriacum* may not only act as a rich source of potential cancer therapeutics but may also provide new avenues for the design of novel anticancer drugs.

## CALL FOR PAPERS

### Turkish Academy of Sciences (TÜBA)

TÜBA is pleased to announce a call for papers for the international conference on **Global Transformations and Türkiye** organized in Istanbul by the TÜBA International Relations Working Group.

#### Important Dates

Deadline for Abstracts: **26 February 2024**  
 Informing authors of the acceptance of their applications: **11 March 2024**  
 Submission of full papers: **12 April 2024**  
**Conference: April 18-20, 2024**

**Language**  
 English

#### Submission Process

<https://conference.tuba.gov.tr/>

The poster features the TÜBA logo at the top, followed by the text "TÜBA TÜRKİYE BİLİMLER AKADEMİSİ TURKISH ACADEMY OF SCIENCES". Below this, it reads "International Conference on **Global Transformations and TÜRKİYE**". The conference dates are "April 18-20, 2024" and the location is "İstanbul / Türkiye". The website "https://conference.tuba.gov.tr" is provided. At the bottom, there are three circular icons with dates: "26 Feb Deadline for abstract submission", "11 Mar Notification of acceptance", and "12 Apr Deadline for full paper submission". Social media links for TÜBA are also listed at the bottom.

## NOTE: HORIZON PROBLEM IN COSMOLOGY

*Muhammad Asghar FLAS*

**Abstract:** This Note treats the origin of the horizon problem and its possible solution through the cosmic inflation theory.

### 1. Horizon problem.

The horizon problem arises because of the difficulty in explaining the observed homogeneity of the casually disconnected regions of space in the absence of a mechanism determining the same initial conditions everywhere (1).

For a homogeneous space, no point in space is special, so the basic laws of physics should govern all space. The spatial distribution of the 2.725°K black body cosmic microwave background (CMB) with a very small temperature fluctuation  $\Delta T$  from the average temperature  $T$ :  $\Delta T/T = 10^{-5}$ , shows that the observable universe is quite isotropic which through the Copernican principle (an observer does not occupy a special place in the universe) also implies its homogeneity. Moreover, this very small  $\Delta T$  signifies that the entire sky and, thus, the entire observable universe must have been causally connected long enough for the universe to be in black body thermal equilibrium.

The causally disconnected regions in the universe are those regions where the information-bearing light signal has not reached yet. In fact, the distant regions of the observable universe in opposite directions of the sky are estimated to be around 94 billion lightyears apart, implying that, assuming the standard Big Bang expansion, they could never have been in causal contact with each other, because the light travel time between them exceeds the age of 13.7 billion years of the universe.

### 2 “Cosmic inflation theory” as a solution to the horizon problem.

The cosmic inflation theory is invoked as a possible solution to the horizon problem. It claims that just after the first second of the Big Bang explosion, when the small universe was entirely in causal contact and in near equilibrium, but with high quantum fluctuations, it went through a  $10^{-32}$ -second period of exponential expansion due to a scalar field interaction (2). Its size increased

linearly by more than 60 “e-fold” or a factor of about  $10^{26}$ . This rapid expansion isolated the nearby regions of space by growing them beyond the limits of causal contact but locking in the fast expansion-produced space homogeneity at large distances (2). The inflation theory’s claim of preserving the homogeneity of all the causally connected and non-connected regions of space with strongly reduced quantum fluctuations, is supported, as explained above, by the analysis of the black-body cosmic microwave background (CMB) data. However, despite the success of this theory in explaining the horizon problem, at present, there is no specific and direct experimental sign of this cosmic inflation such as the gravitational waves produced by the supposed fast spatial expansion or other possible signs.

### References

1. Carrigan Richard A; Tower Peter (1983) “Magnetic Monopoles.”
2. “An Exposition on Inflationary Cosmology”, Gary Scott Watson, Dept. of Physics, Brown University.
3. Remmen, Grant N; Carroll Sean M (2014) “How many e-folds should we expect from high-scale Inflation?” *Phys. Rev. D.* 90 (6) 063517.

## NOTE: THE SCIENTIFIC METHOD

*Muhammad Asghar FLAS*

The discussion of the "scientific method," when limited to philosophical discussion is useful but limited in its scope until an objective method is used to reduce it to the minimum possible choice made and tested in an objective physical (experimental) set up. In short, the philosophical concept followed by an objective and reproducible test is defined as the scientific method. This is the basis of all the scientific activity to discover the truth of some phenomenon, of some cause, of some happening, but here one cannot claim that this truth is absolute as is the case sometimes implying that the quality of truth improves when facing contradictions that come up with better measurements. This leads to a new and better theoretical algebraic setup of Algebraic equations. Finally, it is well known that the concept of "scientific method" was introduced, for the first time, by the Arab (Persian) Ibn al-Haytham working on optics in the 10th AC.

# NAVIGATING THE DIGITAL MORAL COMPASS: UNVEILING THE ESSENCE OF DIGITAL ETHICS

*Zabta Shinwari\*\**

*Vice President, Islamic World Academy of Sciences*

I participated in the international project 'Academies for Global Innovation and Digital Ethics' (AGIDE), which the Austrian Academy of Sciences (OeAW) conducted in collaboration with Academies of Sciences worldwide. I proposed a strategy for the Islamic world to understand the essence of digital ethics as follows:



Navigating the digital moral compass and unveiling the essence of digital ethics is an important undertaking in our increasingly interconnected and technologically driven world. As we grapple with ethical challenges related to technology and digital spaces, it's crucial to develop a robust strategy for addressing these issues. Here is a step-by-step approach to help you navigate the digital moral compass and understand the essence of digital ethics:

## **Define Your Values and Principles:**

Begin by clearly defining your personal or organizational values and ethical principles. These will serve as your guiding light as you navigate the digital landscape.

## **Understand Digital Ethics:**

Invest time in understanding what digital ethics means. Digital ethics involves the application of ethical principles to the digital world, including areas like privacy, cybersecurity, AI, and more.

## **Educate Yourself and Your Team:**

Stay updated on the latest developments in technology and digital ethics. Share this knowledge with your team and stakeholders, as awareness is the first step towards ethical decision-making.

## **Assess Ethical Challenges:**

Identify the specific ethical challenges and dilemmas that your organization or community faces in the digital realm. Consider issues like data privacy, algorithmic bias, cybersecurity, and more.

## **Create Ethical Guidelines:**

Develop a set of ethical guidelines or a code of conduct that outlines how your organization will approach digital ethics. This can serve as a reference for making ethical decisions.

## **Engage Stakeholders:**

Involve all relevant stakeholders, including employees, customers, and the public, in discussions about digital ethics. Seek their input and feedback to ensure a more comprehensive perspective.

## **Risk Assessment:**

Assess the potential risks and consequences of your digital initiatives. Evaluate how these risks align with your ethical guidelines and principles.

## **Transparency and Accountability:**

Emphasize transparency in your digital operations. Make sure you are accountable for your actions and decisions in the digital space. Transparency builds trust.

## **Data Privacy and Security:**

Prioritize data privacy and security. Implement strong cybersecurity measures to protect sensitive data. Ensure that your data practices are compliant with relevant regulations.

## **Ethical AI and Automation:**

If your organization uses AI or automation, ensure that these technologies are designed and operated in an ethical manner. Address issues of bias and fairness in AI algorithms.

## **Continuous Evaluation and Improvement:**

Regularly assess your digital ethics practices and make necessary improvements. The digital landscape is dynamic, and ethical challenges evolve over time.

*\*\* Prof. Zabta K. Shinwari T.I., S.I.; UNESCO Laureate Distinguished National Professor/Prof. Emeritus, Quaid-i-Azam University, Islamabad-Pakistan. Fellow, The World Academy of Sciences (TWAS); Pakistan Academy of Sciences & Vice President Islamic World Academy of Sciences.*



### **Learn from Ethical Dilemmas:**

Embrace a learning mindset when faced with ethical dilemmas. Analyze past mistakes or ethical challenges as opportunities for growth and improvement.

### **Collaboration and Advocacy:**

Collaborate with other organizations, researchers, and advocacy groups working on digital ethics. Sharing best practices and insights can lead to collective progress.

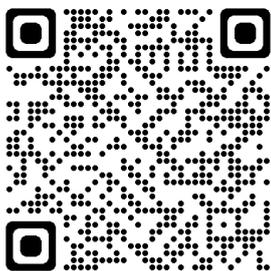
### **Public Awareness and Education:**

Engage in public awareness campaigns and educational initiatives to inform the broader public about digital ethics. Empowering individuals with knowledge is crucial.

### **Adapt to Emerging Technologies:**

Be prepared to adapt your ethical framework as new technologies and digital trends emerge. The essence of digital ethics should remain relevant to the times. By following these steps and continuously reflecting on your actions, you can effectively navigate the digital moral compass and uphold the essence of digital ethics in your personal or organizational endeavors. Remember that ethical decision-making is an ongoing process that requires vigilance and a commitment to doing what is right in the digital realm.

*To access IAS Newsletter issues*



## **PROF. YAHYA TAYALATI, HONORARY FIAS ELECTED MEMBER OF THE WORLD ACADEMY OF SCIENCES (TWAS)**



Prof. Yahya Tayalati, a renowned scientist in the field of high-energy physics, was recently elected as a member of the World Academy of Sciences (TWAS).

TWAS is a global academy based in Trieste, Italy that aims to promote science in developing countries and to contribute to reducing the scientific gap between countries.

Dr. Yahya Tayalati, an esteemed experimental physicist, has left an indelible mark in the realm of particle physics. Commencing his professional journey with a doctorate from Mohammed I University in Morocco, he delved into two key areas: proposing a magnetic solution to the solar neutrino problem and investigating the potential detection of neutrino oscillations through the ANTARES telescope.

His groundbreaking research significantly advanced our comprehension of neutrino oscillations in the Sun and enhanced the capabilities of neutrino telescopes. Subsequently, ANTARES played a pivotal role in the ATLAS collaboration, specializing in the production of ATLAS pre-sample units. This specialization not only increased the precision of energy measurement but also conveyed indispensable contributions to the field of calorimetry in high-energy physics.

Dr. Yahya Tayalati also played a central role in Morocco's ambitious endeavor to construct the world's largest underwater neutrino telescope, KM3NeT, marking a substantial international effort pushing the boundaries of research in neutrino physics.

Beyond his contributions to physics, Dr. Yahya coordinated multiple research projects dedicated to improving treatment protocols in cancer and combating tuberculosis, showcasing his dedication to crucial public health issues.

In Morocco and beyond, Dr. Yahya Tayalati stands as a beacon of scientific excellence, embodying a profound commitment to research and innovation on both local and global scales.

# QURANIC CAMPHOR: A SCIENTIFIC STUDY<sup>1</sup>

Mohammed Iqtedar Husain Farooqi  
Deputy Director (Retrd,) &  
Incharge, Plant Chemistry Division  
National Botanical Research Institute, India

## Quranic Reference on Camphor:

### 1. SURAH LXXVI

(*Ad-Dahr* - Time). V: 5

*As to the Righteous they shall drink of a cup (of Wine) mixed with Kafur*



Ibn Kathir, in his *Tafsir* (Commentary) of SURAH *Ad-Dahr*, Verse 5, states "They (in *Jannah*) will be given a drink (a cup of wine) that is mixed with camphor *Kafur* (كافور), and it is cool." He then adds "Then on another occasion they will be given a drink mixed with ginger (Verse 17), and it is hot. This is so that their affair will be balanced. However, those who are nearest to Allah, they will drink from all of it however they wish, as Qatadah and others have said".

In almost all the commentaries and translations of the Qur'an, *Kafur* has been described as the Camphor of plant origin. In *Tafseer-e-Majidi* (Note on of the relevant SURAH), characteristics and qualities of Camphor are given, and stated that the camphor of Heaven would be without the harmful effects, and would be different from the camphor of the Earth. In *Tafhim-ul-Qur'an*, it has been stated that the wine of Heaven would have the brightness and coolness of the Camphor and this will not actually be its mixture. Similar views have been expressed in *Tafseer-e-Haqqani*, *Tafseer-e-Umani*, *Bayan-ul-Qur'an* and *Tafseer-e-Mazhari*. Some Commentators have also stated that *Kafur* is the name of a spring full of wine. In the opinion of Abdullah Yusuf Ali (Note No. 5835), Camphor in small amount is agreeable in any drink and, therefore, the Heaven's wine may be a mixture of Camphor. Pickethal has retained the word *Kafur* in his English translation, but Arther Arberry has translated it as Camphor. These commentaries are generally based on *Tabari*, *Qartabi* and *Asqalani*. According to Parvez Khan and some other Islamic Scholars express the opinion that the quaffing of camphor drink will have the effect of cooling down passions in *Jannah* dwellers. ([https://www.academia.edu/5836327/SURAH\\_AL\\_I\\_nsaan\\_Tafseer](https://www.academia.edu/5836327/SURAH_AL_I_nsaan_Tafseer)).

Since the science of naming of plants (Nomenclature) by family, genus and species of plants developed as late as late as 18th or early 19th century, earlier *Tafasir* (Commentaries) of Quran do not through much light on Quranic and Prophetic plants.

In Arabic Dictionaries like *Al-Munjid* and *Lissan al-Arab*, several meanings of *Kafur* have been given. For instance, apart from camphor, it is said to be the covering of the unripe bunches of grape and dates. It is also described as the perfume obtained from certain types of deer. Some Dictionaries claim that the root of *kafur* is *kufur* meaning to cover and *Kafur* is obtained from inside of the trunk (covered by the bark of the tree).

In many standard translations of the Quran, the word *Kafur* is retained as such. For instance, Pickethal has not translated *Kafur* to Camphor but preferred to retain it.

All these commentaries, translations and Dictionary meanings create some confusion about the real identification of Quranic Camphor.

Before attempting to identify the actual plant source of *Kafur* of the Quran and of course the *Kafur* mentioned is several Traditions, it would be worthwhile if the history of the present-day Camphor is traced out first.

Since the early times, two types of plants have been the commercial sources of Camphor. One is the Malaysian/Indonesian plant *Dryobalanops aromatica* and the other is the Chinese/Japanese plant *Cinnamomum camphora* (syn *Camphora officinarum*; syn *Laurus camphora*).

The camphor from the Malaysian/Indonesian (Java/Sumatra) plant is known in India as *Qaisuri Kapur* because it was imported from the areas called *Qaisur* of the Java Island. This *Kafur* (Camphor) was very costly as compared to the Chinese *Kafur* (Camphor), which was introduced in India much after the Java Camphor. During the thirteenth century A.D., the price of Java Camphor was equal to that of gold. Even during late nineteenth century, the price of *Qaisuri Kafur* (India-*Bhimsaini Kapur*) in India was much higher than Chinese Camphor. There is every likelihood that the Arabs who had very old trade relations with India, knew about this Java Camphor through their trade. But the main question is the period and the time when Arabs became familiar with it. It is very definite and obvious that there is absolutely no reference to Camphor in the ancient civilization of Egypt or Rome or in the old Greek medicine. None of the famous naturalist of the pre-Christian era, like Aristotle, Plato, Pliny, Dioscorides, Theophrastus etc. have mentioned Camphor in their works. It also does not find a reference in the famous books of medicine by Galen.

<sup>1</sup> Source: *Plants of the Quran* (10<sup>th</sup> Edition 2019) By Dr. M.I.H. Farooqi, Sidrah Publishers, Lucknow-226007, India. E-mail: [mihfarooqi@gmail.com](mailto:mihfarooqi@gmail.com)

In short it can be safely stated that during the period before Christ and even thereafter during the next few centuries after Christ, there is no indication that the old cultures of Southern Europe, Egypt and Arabia knew this important plant product. Hitti has given a very vital proof of the ignorance of Camphor by early Arab Muslims. According to him when Muslim Army headed by Sa'ad bin abi Waqqas defeated the Iraqis and Persians in 637 A.D., the Arab soldiers came across a white substance somewhere in Madain (Persia), which they mistook as salt but which was actually the Camphor about which they had no previous knowledge. The same instance has been reported in greater detail by *Al-Fakhri* and *Al-Tabari*. It is said that several Arab soldiers during their expedition of Iraq and Iran in 637 A.D. found a leather bag containing a white substance. They mistook it as salt but before they could use it, someone told them that it was a medicinal substance called *Kafur* in Persian. They purchased this *Kafur* for two Dirhams and reported this episode to the Caliph Umar at *Al-Madina*. (Encyclopedia Iranica).

Jabir Bin Hayyan (Born 722 AD) was the first Arab Scholar who described harmful properties of Camphor in his famous treatise "Book of Poison". (Pl see references). Afterwards well-known Persian Geographer Ibn Khordadbeh (c. 820 - 912 CE) mentioned Camphor (Indian/Indonesia *Kapur*) in his classic work (*Kitab al Masalik n'al Mamluk* (The Book of Roads and Kingdoms)).

Subsequently, there have been detailed descriptions of *Kafur* by the Arab writers; all of them referring to it as the product of Malaysian/Indonesian plant. It is important to note that by this time the Chinese Camphor was not known. It was only in the thirteenth century A.D. that Marco Polo (1254 -1324) gave a detailed account of Camphor producing trees of both from Malaysia and China. This was definitely the first authentic reference of Chinese Camphor, which later on became an important item for the European trade. Thus, it can be clearly inferred that the Camphor (*Kafur*) referred to by the Arab Physicians in the late ninth century A.D. and afterwards was actually the Java/Borneo (Malaysia/Indonesia) Camphor and in all likelihood, they procured it through India and Persia. In India it was called *Kapur* or *Karpura* and in Persia it was known as *Kafur*. Thus, *Kafur* seems to be the Persian derivation of the Indian (Sanskrit) word *Kapur* or *Karpura* and not the Arabic derivation. Steingass Persian (Dictionary) has also mentioned *Kafur* as a Persian word.

This history of Camphor clearly demonstrates that the Arabs, in all probability, did not know much about Camphor before the advent of Islam, neither through the Indian trade nor through the Greek medicine. In fact, there are no definite proofs of its knowledge and

wide use in India during fifth or sixth century A.D. This important product, however, became very familiar to the Arabs after ninth century A.D. Now the question is that if the Arabs were not familiar with the present day *Kafur* (Camphor) at the time of Quranic revelation, then what was the substance called '*Kafur*' in the Quran and many Traditions. But before going deep into this question, let us consider the chemical and medicinal properties of both the Malaysian/Indonesian) and Chinese/Japanese) Camphor.



*Camphor Tree (Dryobalanops Aromitica) - Quranic Name: Kafur*

The Camphor is a white solid mass with a pungent smell and taste. It is highly toxic and readily absorbed from the skin. The Java Camphor from *Dryobalanops aromatica* contains d-Borneol as the main constituent and is obtained by scratching the white exudates from the trunk and branches of the tree. However, extracting the wood with boiling water and then purifying the extract through sublimation produce the Chinese Camphor from *Cinnamomum camphora*. It consists of 2-camphanone. Both types of Camphor are similar in properties and action. Since the pungency of Camphor is disagreeable, it is not used in food preparations. Moreover, its importance in medicine, whether for internal or external use, is always with caution. It is advised that Camphor containing medicines should be kept away from children because not only its consumption but also its smell could result in giddiness, vomiting, nausea, and stomachache. Camphor is an important constituent of many ointments for external use as an analgesic and also helps in fibrositis neuralgia. In other words, one can say that Camphor is highly efficacious as medicine, both internally and externally but it is not suitable for any food preparation or as flavour additive in drinks. As a matter of fact, one cannot drink water if it contains even traces of camphor. It is quite unlikely that wine or other drinks containing camphor could have been used at any time in Arabia or elsewhere in the world.

Now, in view of the historical and well known and established chemical facts about Camphor, one must seriously consider whether the *Kafur* of Quran is in reality the present-day Camphor or is it something else? If the word *Mizajuba* (مِرْجُوبَة) (SURAH LXXVI-

Verse 5) means the mixture with the taste of Camphor, then the Quranic *Kafur* may be something different. This problem may be solved if we refer to the Book of Songs of Solomon (Verse 1: 4) of the Bible wherein a word *Kopher* (*Copher*) has been mentioned. In the said Verse it is stated:

"My beloved (Solomon) is unto me as a cluster of *Copher* (Henna) in the Vineyards of En Gedi". Similarly, Verse 4: 3 of the same Book says, "The plants are on orchards of pomegranates with pleasant fruits, Henna (*Kopher*), with spikenard."

In the early translations of the Bible, *Kopher* (*Copher*) was interpreted as Camphor. However, after a great deal of study and research, it was concluded that Camphor was not known during the period of Moses or Christ and the word *Kopher* was actually the name of Hinna blossom (Flowers-*Lawsonia inermis*) in the Aramaic language. This plant (Egyptian Privet) was well known and commonly found in Arabia and Egypt. Thus, in the subsequent versions of Bible, viz., Moffat Version and Godspeeds Version we find the mention of Hinna instead of Camphor as the synonym of *Kopher*. Moreover, in old Greek literature Hinna was called *Kufros*. Now the next pertinent question is, whether the Quranic word *Kafur* was actually derived from the Aramaic word *Kopher* and Greek word *Kufros* or from the Indian (Sanskrit) word *Kapur* (or *Karpura*) as suggested by some recent Mufassarin of Quran (Commentators of Quran). In my own humble opinion, the origin of Quranic *Kafur* is Aramaic/Hebrew *Kopher* or *Kufros* signifying Hinna Blossom, source of the oldest perfume known, and not Indian *Kapur*, meaning Camphor. Henna Blossoms are so fragrant, they've been used in perfumes since 1500 BCE.

[https://en.wikipedia.org/wiki/Biblical\\_languages](https://en.wikipedia.org/wiki/Biblical_languages)

Prophet Muhammad is reported to have said: Best of all perfume in this world and hereafter henna blossom (*al fagia* الفاجية) (Pl. see reference).

It may be pointed out that many Quranic names of plants, fruits and seeds have their origin from the Aramaic as well as Greek languages and, therefore, there are several Quranic names of plants which are similar to those given in Bible. Some such similarities are cited below:

1. For Lentil, the Quranic name is '*Adas*' whereas Biblical word (Hebrew) is Adasha.
2. For Pomegranate, the Quranic name is *Rumman* and the Biblical (Hebrew) word is Rimmon.
3. For Olive, the Quranic name is *Zaitun* whereas the Biblical (Hebrew) word is Zaith.
4. For Grapes, the Quranic name is '*Inab*' and the Biblical word is Enave.
5. For Cucumber, the Quranic name is '*Qiththa*' and the Biblical name is Kishium.

6. For Mannan, the Quranic word is '*Mann*' and Biblical is Man.
7. For Onion, the Quranic name is *Basal* whereas Biblical is Belsal.
8. For Fig, the name given in Quran is *Teen* and the name in Bible is Teenah.

Now, if all the above words, as also many others, are similar or very near to each other in the Quran and the Bible, there is every likelihood that the Quranic *Kafur* is similar to Biblical *Kopher*. It is very likely that during pre-Islamic period *Hinna* or *Itre-e-Hinna* (Perfume of Henna) was called *Kafur* in Arabic but when the present-day Camphor became known and familiar to the Arabs during 7th to 9th century A.D., the Persian derivations was adopted in Arabic for Camphor and only *Hinna* was retained for *Lawsonia inermis*. Such influence of Persian language on Arabic or vice versa is logical and understandable, particularly in view of the fact that Arabs and Persians came into very close contact just after the advent of Islam. During the 8th and 9th century A.D. many useful commentaries on the Quran were written in Persia and all of them referred to Quranic *Kafur*, probably erroneously, as Persian *Kafur*. It is very important to note that Dioscorides, a well-known naturalist before Islam has used the word *Kufros* for Hinna (*Lawsonia inermis*) in his Treatise on Natural Science. Thus, it is very obvious that like many other words of the Quran, *Kafur* has its origin either in Aramaic/Hebrew or Greek language and not in any Indian language as generally believed.

*Hinna* (*Lawsonia inermis*) is a commonly occurring plant of Arabia and since time immemorial, the perfume of *Hinna* (*Itre-e-Hinna*) obtained from the flower/blossom has been used as an important article of cosmetics. The flowers of Henna have a cooling effect and are also a very good stimulant. When someone says that particular wine will have the flavor of *Hinna*, it is a scientific statement and one can appreciate it. Prophet (SAW) is reported to have said that the best fragrance is the fragrance of *Fagia* (Hinna blossom).

George Watt (A Dictionary of the Economic Products of India) has written that Arabic Poet *al-Qais* (sixth century A.D.) was the first person to have referred to the word *Kafur* in his poetry. But any mention of the word *Kafur* in the poetry does not necessarily mean that it refers to Camphor. It is more likely that by *Kafur*, *Imru' al-Qais al-Kindi* might have meant *Hinna* blossom and not Camphor. However, the references to *Kafur* in the poems of Al Hajjaj (762 A.D.) and Al-Rayees (738 A.D.), as mentioned in the *Lisan al-Arab*, might be to the present day Camphor, because during the period of these two poets, a great revolution in medicine and other branches of Science had already been initiated by the Arab Muslims and, therefore, there is every likelihood that the Camphor was

introduced to the Arab society as a medicine of great value and people became familiar with it. As already stated above Jabir ibn Hayyan (721 -815AD), also mentioned Persian *Kafur* (Camphor) in his famous treatise Book of Poison.

It was after this Science revolution of Islam that commentaries on Quran, mostly by Persians, were written wherein *Kafur* was translated as Camphor. It is also very significant to note that all the important Dictionaries of English language like the Oxford Dictionary and the Cambridge Dictionary, published during late nineteenth and early twentieth century, have given three meanings of the word Camphor or its equivalent Camphire. The first is the pungent smelling product of the Malaysian/Indonesian plant, the second is the white medicinal substance extracted from the Chinese plant and the third meaning given is the Henna plant. Apart from these Dictionaries, other English and French Books on the Bible including the famous Book 'La Botanique de La Bible' also describe *Hinna* (French, Henni) as the Camphor (*Copher*) of Bible. It seems that scholars and commentators of the Quran have missed this aspect of the history of Camphor.

There are several references to *Kafur* in many sayings of Prophet Mohammad (SAW) but according to an important article on *Tibb al- Nabvi* (Medicine of Prophet), none of the *Hadith* gives any medicinal description or use of *Kafur*. Thus, these *Abadith* (plural of *Hadith*) do not prove the identity of *Kafur* as Camphor. It may be noted that in many Traditions, Prophet advised to mix *Kafur* in water for *Gusl el Mayyet* (غسل ميت). In one of the *Hadith* of *Sabih Muslim*, Um Tamiya is reported to have said that Prophet advised her (When Zainab, the daughter of the Messenger of Allah died) to wash her odd number of times and put/mix *Kafur* or something-like *kafur* in final washing."(Pl. see the *Hadith* below). What is something like *kafur*: difficult to know.

It is important to note that Camphor of either from Java or China, is insoluble in Water. Prophet advised to mix the *Kafur* in water for *Ghusl* and not to spread/sprinkle it on the dead body after final wash.

As reported by Encyclopedia Iranica, Camphor (Persian *Kafur*) was a rare, precious exotic substance and during early seventh century AD Indian Kings used to send *Kafur* (Indian *Kapur*) to Kosrow (Khusro) of Persia as gifts.

It is very obvious that the highly costly Persian Camphor was definitely not such a common commodity in Hijaz and Najd so as to be available for *Gusl el Mayyet*. *Hinna* blossom could have been definitely a common source of perfume, under the name of *Kafur* or *Qafur* (*Al-Bukhari*), of that area and

could have been utilized during the last rites. Another fact may be repeated here that up to the 13<sup>th</sup> century the price of Camphor was equal to that Gold and, therefore, Camphor (*Kafur*) was used only in small amounts as a constituent of important ointments. Present day obligatory practice of rubbing/putting or sprinkling camphor on several parts of the dead body like the forehead, nose, etc. after the ablutions was never reported during the time of Prophet. As a matter of fact, even if available in Madina, such a costly product could not be the part *Gusl el Mayyet*. This was the Sasanian funerary practices which would have been adopted by Muslims when Camphor was easily and cheaply available.

It was only during the fifteenth to seventeenth century that Camphor became a comparatively cheap article after the introduction of Chinese Camphor in the world market. It became still cheaper when it was synthesized from turpentine. Another fact should be kept in mind that even today Camphor is not mixed in water (It is nor soluble in water) for the final bath.

To conclude and in my humble opinion, the Quranic *Kafur* must be taken as Henna Blossom / Flower Fragrance (*Lawsonia inermis*) and not Camphor (*Dryobalanops aromatica*). Nevertheless, it is for the Arabic Scholars and authorities on the Quranic interpretation (Commentaries) to give final verdict on this aspect of the meaning of Quranic *Kafur*. I appeal to all the scholars of Muslim countries as well as those belonging to the Islamic Centers around the world to give a serious thought to this matter. One must bear in mind that any change in the meaning or a different interpretation of some words, does not affect the message of the Holy Quran.

### Some Important References on Camphor

When the Arabs entered Madaen in 637, they found a lot of camphor, which they took for salt until they used it in bread and discovered its bitterness (*Tabari*, I, p. 2445, *Al Fakhri* by Ibn Tiqtaqa). The medicinal virtues of camphor were discovered later in the Islamic period. Camphor was a rare, precious exotic substance and was therefore valued as a gift worthy of sovereigns; as such it figures among the gifts sent by the emperor of China to Alexander, the gifts given by the king of India to Kosrow (Biruni's historical account). It is probable that the use of camphor in the Islamic ablution of the dead (*Gusl el Mayyet*) was influenced by Sasanian funerary practices. The camphor was not produced in India proper, though this misconception persisted throughout the first centuries of the Islamic period. (Encyclopedia Iranica)

The first Arab Author to refer to the use of Camphor was Jabir Bin Hayyan (Born 722 AD) in his "Book of Poison", where he catalogued it potential harmful

properties. (Dragon's Brain Perfume: An Historical Geography of Camphor By R. A. Donkin - 1996)

The word *faghiya* (فاغية) 'to blossom,' refers to the henna flower and the perfume made from it (Lane, 1863, pg. 2423). By the end of the 19th century "a cluster of camphire/Camphor" had been replaced in Bible translations with "a cluster of henna blossoms" (John Philips)

The most perplexing occurrence found only once: the passage of SURAH The resurrection (76:5) which says that the *Kafur* heavenly drink. This word is rendered by camphor - the English term derived from it - yet camphor has an awful taste. Where does the error lie? Koranic text must be read in the light of the Aramean traditions, a fact also established by the German philologist Christ of Luxembourg. The word *kufra* remained to designate hennah to be the most sublime perfume to ever have existed on earth, a celestial perfume so to speak. The Koranic text corroborates this. (Edward- M. Gallez, Symposium of Toulouse, October 22, 2007).

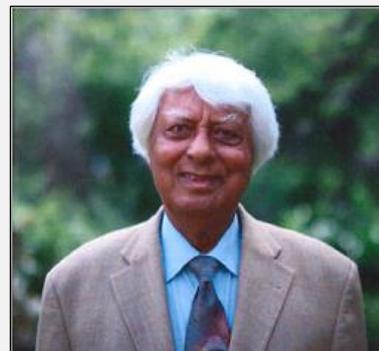
Camphor is highly toxic and therefore 1 gram can be Lethal dose for a child and 20 grams can be fatal for adult. Camphor can be absorbed through the skin and therefore should not be applied to open Wounds or Burns. Camphor from *Dryobalanops aromatica* is in the form of exudates (Borneol) whereas crystalline camphor is made from the wood and leaves by steam distillation. *Dryobalanops aromatica*, commonly known as *Kapur* (Malaysian/Indonesian Language), was one of the main sources of camphor and attracted early Arab traders to Borneo, at that time worth more than gold.

<https://www.forestry.gov.my/index.php/en/9-explore/1002-Dryobalanops-aromatica>

#### Important Traditions (*Hadith*) on *Kafur*

1. Narrated Um Atiyya One of the daughters of the Prophet died and he came out and said wash her three or five times or more, if you think it necessary, with water and Sidr and last of all sprinkle *Kafur* - (Book of Funeral - *Sahib Al-Bukhari*).
2. Umm 'Atiyya reported: When Zainab the daughter of the Messenger of Allah died, he said to us: Wash her odd number of times, i. e. three or five times, and put camphor or something-like camphor at the fifth time, and after you have washed her inform me. So, we informed him and he gave us his undergarment, saying:" Put it next her body." (*Sahib Muslim*).
3. Best of all perfume in this world and hereafter henna blossom/al *fagia* (Anas bin Malik, Shuabul Iman, Behaqi).
4. Abu Abdullah said: Qust قسط and Kust كست same as *Kafur* and *Qafur* قافور. (*Sahib Al-Bukhari*).

### PROF. SYED M. QAIM FIAS CHAIRS A TECHNICAL MEETING OF IAEA



The International Atomic Energy Agency (IAEA) in Vienna organized a Technical Meeting on Nuclear Data for Medical Applications from 28 to 31 August 2023 in which about 20 experts from 15 countries participated (in person or virtually). Professor Dr. Syed M. Qaim from the Forschungszentrum Juelich and the University of Cologne, Germany, was asked to chair the whole 4-day event and lead the technical discussions. The aim of such meetings is to advise the IAEA about the new developments and future directions in a specific field.

Professor Qaim is a leading authority in the area of medical radioisotopes and has been advising the IAEA and the World Council on Isotopes (WCI) in this field for many years. He was the Chairman of the International Nuclear Data Committee of the IAEA for about six years. During this period he induced the IAEA to expand its nuclear data activities by including medical applications, which has now become an integral part of the work of the IAEA.

Professor Qaim is a Foreign Fellow of the Pakistan Academy of Sciences (PAS), a Fellow of the Islamic World Academy of Sciences (IAS) and a Fellow (from North) of the World Academy of Sciences (TWAS). He has always supported the development of science in Islamic and other Third World countries.

## PROF. EROL GELENBE, HONORARY FIAS AWARDED THE IEEE TRUSTCOM 2023 AND THE IEEE MASCOTS 2023 BEST PAPER AWARDS

Erol Gelenbe & Mohammed Nasereddin received the Best Paper Award at IEEE Trustcom 2023, for their work on "Protecting IoT Servers Against Flood Attacks with the Quasi Deterministic Transmission Policy," from the General Chairs Profs. Geyong Min & Willy Susilo, and Program Chairs Profs. Jia Hu, Zakirul Alam Bhuiyan & Xing Chen. The ceremony was on November 2, 2023, in Exeter, UK.

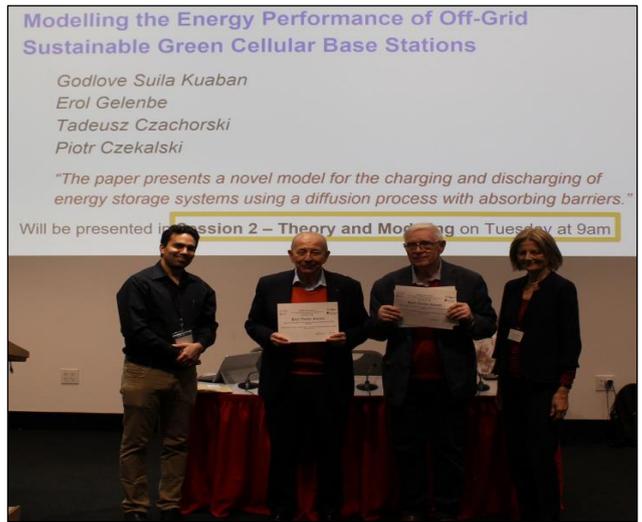


Prof. Erol Gelenbe (left), and Prof. Min (right).

Prof. Gelenbe also gave the Opening Keynote on "Random Neural Networks (RNN) for Accurate CyberAttack Detection and Mitigation at the Edge", during the conference on Cybersecurity, Computer Systems and Networks experts, that was attended by a large group of participants from China, US, Europe, and across the world.



On October 16, 2023, at Stony Brook University, New York, USA, MASCOTS 2023 Program Chairs presented Prof. Gelenbe with a Best Paper Award for his conference paper published in the IoTAC project at the MASCOTS 2023 Symposium. The paper was entitled 'Modelling the Energy Performance of Off-Grid Sustainable Green Cellular Base Stations'.



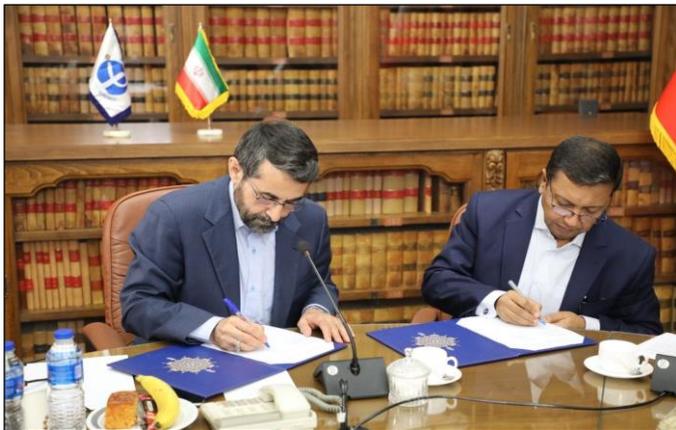
Erol Gelenbe (left center) & Tadeusz Czachorski (right center).

**Erol Gelenbe** a Professor in the Institute of Theoretical and Applied Informatics, Polish Academy of Sciences, has conducted computer science research based on Quality of Service Analysis and Artificial Neural Systems, with patented innovations and publications in leading journals, that has enabled real-time energy-efficient multi-party human communications over the Internet. His other published research and patents are used to detect anomalies from MR Images and genetic data, and to identify possible disease. His related work also enables the detection of attacks on networks and the Cloud, offering robust machine learning based attack mitigation techniques through dense collaborations with European industry. He has graduated over 90 PhDs. For his research, he received the Gran Prix France Telecom Prize (1996), the Parlar Science Award of Turkey (2004), and the ACM-SIGMETRICS Life-Time Achievement Award that states that he is "characterized as the single individual who, over a span of 30 years, has made the greatest overall contribution to the field of Computer System and Network Performance Evaluation through original research, mentoring and doctoral training, creation and direction of world class research groups, wide ranging international collaboration, and professional service."

He also received the IET UK Oliver Lodge Medal (2010), and the Mustafa Prize (2017). He was awarded *Honoris Causa* Doctorates from the Universities of Roma II (1996), Bogazici, Istanbul (2004), and Liege, Belgium (2006). The French President awarded him *Chevalier de la Legion d'Honneur* and *Commandeur du Merite*, while the President of Italy awarded him *Commendatore al Merito della Repubblica* and *Grande Ufficiale dell'Ordine della Stella d'Italia*. He is an Honorary Fellow of the Hungarian Academy of Sciences (2010) and of the Islamic World Academy of Sciences (2022). He was elected a Foreign Fellow of the Royal Belgian Academy of Sciences and the Polish Academy of Sciences. He is a Fellow of the French National Academy of Technologies and of the Science Academy of Turkey.

## H. E. PROF. DR. M. IQBAL CHAUDHARY VISITED THE PASTURE INSTITUTE OF IRAN TO PROMOTE VIROLOGY RESEARCH IN OIC REGION

*H.E. Prof. Dr. M. Iqbal Choudhary visited the Pasture Institute of Iran to promote Virology research in OIC region. Pasture Institute of Iran and Ministerial Standing Committee on Scientific and Technological Cooperation of the organization of Islamic cooperation signed a Memorandum of Understanding.*



H. E. Prof. Dr. Iqbal Chaudhary, the Coordinator General of COMSTECH (Organization of Islamic Cooperation Standing Committee on Scientific and Technological Cooperation), on September 29, 2023, visited the Pasteur Institute of Iran, and signed a Memorandum of Understanding (MOU) with Dr. Rahim Sorouri, the Director of Pasteur Institute of Iran.

The agreement entails the development and implementation of joint educational programs, research, technology, and innovation initiatives, as well as the organization of national and international events, such as conferences, workshops, exhibitions, and courses. Additionally, the MOU aims to facilitate the exchange of students, experts, and academic staff members for professional development and enhancing scientific activities.

The Pasteur Institute of Iran will also become a member of COMSTECH Consortium of Excellence (CCoE) as per the agreement.

During the meeting, Prof. Iqbal Chaudhary acknowledged the Pasteur Institute of Iran as a valuable opportunity for expanding COMSTECH's cooperation. He recognized the institute's distinguished reputation in Iran and worldwide, particularly in the field of infectious diseases and vaccines. Prof. Chaudhary requested the institute's

close collaboration with COMSTECH, which was agreed upon.

During the meeting, Dr. Rahim Sorouri, the Director of Pasteur Institute of Iran, presented the institute's activities and capabilities and expressed their willingness to establish comprehensive scientific collaboration with COMSTECH. During the meeting, several managers from different divisions of Pasteur Institute of Iran highlighted the institute's capabilities and proposed ideas for collaborative efforts. It was ultimately agreed that regular coordination meetings would be held to solidify future agreements.

It should be noted that COMSTECH was established during the third summit of the Organization of Islamic Cooperation in 1981, with the mission of strengthening cooperation between member countries in science and technology. This includes training in new fields, implementing resolutions, proposing programs, and increasing Muslim countries' abilities in science and technology to foster a scientific culture and contribute to socio-economic development and industrialization.



Established in 1920 through an agreement between the Iranian government and the Pasteur Institute of Paris, the Pasteur Institute of Iran is a renowned research and public health center in Iran and the Middle East. Its mission is to conduct advanced research and provide innovative programs in basic and applied medical sciences, with a focus on infectious diseases. The institute also produces vaccines, injectable solutions, and diagnostic kits, while bridging the gap between applied research and industry. Widely recognized as a leading center for vaccine development and manufacture, the Pasteur Institute of Iran has played a vital role in preventing and controlling infectious diseases both nationally and internationally for over a century. Its achievements have earned it a prestigious reputation in the field of infectious disease prevention and control.

## THE PRESIDENT OF PAKISTAN ACADEMY OF SCIENCES & THE PRESIDENT OF THE SENEGAL ACADEMY OF SCIENCE AND TECHNOLOGY VISIT THE ACADEMY OF SCIENCES OF IR IRAN

Prof. Khalid Mahmood Khan, President of Pakistan Academy of Sciences, Prof. Moctar Toure, President and Prof. Ousmane Kane, Vice President of Senegal Academy of Science, met with Prof. Mohammad Reza Mokhber Dezfouli, President, Prof. Ali Akbar Salehi, Vice President for research and deputy of the Academy of Sciences of IR Iran on September 30<sup>th</sup>, 2023.



At first, Prof. Khalid Mahmood Khan introduced the Pakistan Academy of Sciences and the Network of Academies of Sciences in Countries of Organization of Islamic Conference (OIC). He pointed out the fields of collaboration between the two academies according to the memorandum of understanding (MOU) concluded in 2022 and the need to implement its provisions.

Then Prof. Toure introduced the Senegal Academy of Science and Technology and expressed the satisfaction of his trip to Iran. Subsequently, an MOU was signed between both sides.

Afterward, the attendees discussed and exchanged views on global challenges such as food security, climate change, sustainable development, science education, natural hazards, society and culture, science diplomacy, and emerging technologies (artificial intelligence, nanotechnology, biotechnology, etc.) as common challenges among countries.

Finally, the three presidents agreed to constitute a consortium in collaboration with other OIC countries to define joint projects in the aforementioned fields on the agenda.



## H. E. PROF. CHOUDHARY DELIVERED A LECTURE AT TRIESTE NEXT SCIENCE FESTIVAL



H. E. Prof. Dr. M. Iqbal Choudhary, Coordinator General of COMSTECH, delivered a lecture on “Neglected Tropical Diseases-Unbridgeable Gap” at the prestigious Trieste Next Science Festival, Trieste, Italy. He shared the podium with Quarraisha Abdool Karim, President of TWAS and Associate Scientific Director of CAPRISA-Centre for the AIDS Programme of Research in South Africa, Sabah AlMomin, a researcher at KISR-Kuwait Institute for Scientific Research, and Helena Nader, the Head of the Institute of Pharmacology and Molecular Biology at the Federal University of São Paulo.

Prof. Choudhary also attended the TWAS Council Meeting in his capacity as TWAS Vice President (Central and South Asia).

## H. E. PROF. DR. M. IQBAL CHOUDHARY DELIVERED A SPEECH AT THE 5<sup>TH</sup> MUSTAFA (PBUH) PRIZE AWARD CEREMONY

The 9th round of the science and technology exchange program (STEP) was held alongside the 5th Mustafa (PBUH) Prize. Head of Isfahan Province Elites Foundation has said that Muslim scientists from 40 countries participated in the Mustafa (PBUH) Prize on October 02, 2023, Isfahan, Iran. H.E. Prof. Dr. M. Iqbal Choudhary, Coordinator General COMSTECH, spoke at the 5th Mustafa (PBUH) Prize Award Ceremony.



Prof. Choudhary expressed on behalf of the OIC Ministerial Standing Committee (OICCOMSTECH) and on his personal behalf, greetings to the organizers of Mustafa PBUH prize ceremony for putting together another magnificent festival of recognizing excellence in science in the Muslim world. He expressed gratitude to Mustafa Science and Technology Foundation for lightening the candle of hope, and for giving the sense of direction to over 2 billion Muslims. During his speech, he said that their mission **together we can change the world and bring global science, innovation, and education to every corner**, is far sighted and heartening.

He said we live in a world which is defined by knowledge and its applications. As Pakistani Nobel Laureate Prof. Abdus Salam once said the **Developing countries differ from developed countries not only because they have less wealth and capital but because they have less knowledge.**

Launching of Mustafa PBUH Prize was the most significant event in STI landscape of the Muslim world. This prize has now earned global trust as only the finest in their fields were recognized. In that graceful ceremony sharing the stage with Mustafa Prize Laureates, he spoke in various capacities, as a teacher who spent all of his life in imparting education to young people from different corners of the world, as a student of science who believes on its transformational power, and as a technocrat responsible of science and technology cooperation in the vast OIC region.

Prof. Choudhary represented there the Organization of Islamic Cooperation, the second largest group of countries after the United Nations. 57-member states spread over 4 continents home of 1.9 billion people. Over 50% population is below the age of 25 years. He said this tremendous pool of vigor and creativity requires adequate and relevant education which not only help them to improve their lives and become productive citizens of their countries, but also help them to adapt values of rationality, tolerance, respect for others as global citizens. The OIC-COMSTECH has initiated hundreds of programs to promote STI capacity of youth through inter-Islamic cooperation.

He stressed that in today's world, socioeconomic development is no longer dependent on natural resources. Knowledge is the main fuel which runs the engine of world economies. According to 2019 report of Mc Kensy Global Institute, 12 disruptive technologies will generate a wealth of over 33 trillion dollars by the year 2025. These include Mobile internet, artificial intelligence, IoT, advanced robotics, next generation genomics and biotechnology, advanced material by nanotechnology, regenerative medicine, and new energy devices.

However, these knowledge revolutions are taking place largely in Global North and many of our nations are continue to live in the darkness of superstition and ignorance.

He emphasized that we at the COMSTECH felt it is important to have:

- Bipartisan political support for the cause of education, science and technology.
- Sustained and increased expenditures on all levels of education as well as research and development (OIC 0.43% versus 1.78% world average)
- Greater women participation in science
- Greater share of R&D expenditures on emerging and disruptive technologies
- More emphasis on patent and IPR protection as the crucial first step towards innovation and research commercialization

- f. Harnessing of the power of S&T collaboration, across the countries and cultures, for the global common good and for solving the enduring challenges which humanity faces today.
- g. Most importantly we should inculcate **a joy of learning and desire to seek out and consume scientific information in our bright young minds.**

He said we strongly believe the best model for socioeconomic development for the Muslim world is to invest in capacity building of our youth, and skills of young generation.



During his speech he said “We are very proud of our joint initiatives with the Government, institutions, and scientists of Islamic Republic of Iran for the benefit of Muslim Ummah. Iran’s technological development against all odds is an example for others to follow. Most importantly Iran’s willingness to help other Muslim nations represents true spirit of our religion”.

### **H. E. PROF. M. IQBAL CHOUDHARY ADDRESSES UN GENERAL ASSEMBLY SCIENCE SUMMIT UNGA78, CALLS FOR GLOBAL SOUTH’S PARTICIPATION IN SCIENCE**

Prof. Dr. M. Iqbal Choudhary FIAS, Coordinator General of OIC-COMSTech, UNESCO Chairholder, delivered a speech on September 12, 2023 at the opening session of the 78th United Nations General Assembly Science Summit via an online platform at the invitation of Dr. Declan Kirrane, Managing Director of the Science Summit at the United Nations General Assembly.

This significant global event was held to occur in New York during September 12 to 29, 2023, featuring a

distinguished roster of 1,450 speakers from around the world, making it a momentous occasion at the intersection of science and diplomacy.



Prof. Choudhary commenced with the thank ISC Intelligence in Science for their central role in promoting global science collaboration, and successfully arranging the Science Summits during the United Nations General Assemblies.

He represented the COMSTech, the Ministerial Standing Committee on Scientific and Technological Cooperation for OIC. The Organization of Islamic Cooperation is the second largest intergovernmental organization, after the United Nations, with 57-member countries in 4 continents and 1.9 billion people. The core mandate of COMSTech is to strengthen cooperation among OIC Member States in science and technology, and to enhance their capabilities in science based socio-economic development.

Like other developing countries, the OIC world faces a multitude of challenges, including food insecurity, poverty, youth unemployment, female illiteracy, and water scarcity. They are also among the most vulnerable climate stressed countries he expressed during the speech.

In addition, the Muslim world faces perceptual issues, including Islamophobia and distrust. He said

science can help to solve many of these enduring challenges, and to correct the perception. However, for that to happen the fruits of human ingenuity must reach the people who need them the most.

He mentioned that at the COMSTECH, our major focus is to reach-out to the Least Developed member states. Our initiatives in Africa include promotion of climate resilient agriculture, Health Africa program in ophthalmology and neurology, establishment of laboratories and institutions in Gambia, Uganda, Chad, Nigeria, and Sudan, offering of hundreds of Scholarships and Fellowships for LDCs, country specific science program with Sudan, Somalia, Palestine, Yemen, and Mauritania, Virology and vaccine technology training programs, “Science in Exile Program” for displaced researchers, etc. COMSTECH has established collaborative partnerships with institutions in West Africa in confronting challenges of climate change, soil degradation, access to water, and biodiversity loss.

The UN Secretary-General's report, published in May 2023, highlights the impediments in achieving the 17 Sustainable Development Goals (SDGs) and 169 targets by 2030, particularly for the Global South was also mentioned during the speech.

He stressed that clearly countries, including majority of OIC member states, are not on track to meet the 2030 Agenda for Sustainable Development. This calls for transformative changes to shift the world onto a sustainable and resilient path.

Recent post COVID cascading crises, both economic and geopolitical, have amplified the challenges to be met in order to achieve the SDGs.

He said that to achieve SDGs effectively, we must build greater inclusivity and enhance multilateral cooperation on the understanding that science does contribute significantly to tackling global challenges and that it will promote high quality research for the benefit of the global community. Science empowers us with expertise, innovative tools, and creative solutions to address global challenges.

The 2030 Agenda for Sustainable Development position STI as one of the seven key action areas for achieving the SDGs.

In recognizing that STI are key tools for achieving the SDGs, he proposed a four-fold approach:

1. International public research funding Research makes essential contributions to our understanding and safeguarding of sustainability. Although global R&D spending has been increasing, investment remains concentrated in developed countries with limited resources allocated to the Global South. We need to remove disparities in international funding to

foster genuine engagement of researchers in international collaborations. COMSTECH is willing to play a central role in engaging the science community of the Muslim world in research towards solving global challenges, including Greenhouse gas emissions; and unabated natural resources exploitation.

2. A New SDG Goal for Research Cooperation UN General Assembly's decision last year to declare 2022 the “International Year of Basic Sciences” for Sustainable Development was a timely decision. OIC-COMSTECH endorses the idea of establishing a new SDG goal of global research cooperation. This cross-cutting goal will help to integrate scientific research into the sustainable development agenda and help in achieving the sustainability goals.

3. Partnerships Global cooperation has become critical as national or regional science systems, on their own, are not capable of addressing global challenges. Research collaboration and knowledge sharing are crucial for fostering innovation, leveraging expertise, and maximizing the impact of R&D investments. COMSTECH is prepared to contribute as a partner to the “STI for SDG process”. Such a partnership will mobilize a dedicated global community of researchers. COMSTECH also supports the basic concept of “Open Science”. In this connection COMSTECH proposed the creation of a “UN Science and Education Fund to Promote Open Distance Learning”. This fund can be used to provide important distance learning courses such as Edx, Coursera etc to developing countries in Africa and Asia.

4. Science-based post-2030 Agenda and UN Summit of the Future In 2030, another global agenda will replace SDGs, and this political process might start soon. Scientific communities need urgent preparation to make this post-2030 Agenda more science-based, addressing the shortcoming of SDGs. Thus, there is need to co-create a framework for a science-based post-2030 Agenda by combining lessons from SDGs, and state-of-the-art science.

On the occasion of the Science Summit, he proposed setting up a Forum to discuss and identify challenges and mechanisms to strengthen scientific and technological capacity, pertaining to implementation of SDGs. He mentioned OIC-COMSTECH would be happy to serve as its secretariat for the global south.

He ended his speech by thanking Mr. Kirrane of ISC Intelligence in Science once again for inviting him (OIC-COMSTECH) to speak at the inauguration of most prestigious science forum. He expressed the invitation has already sent a positive message to the largely disconnected Muslim world. He has made us realize that they are part of a global science community with a shared future.

## ABU ALI HASSAN IBN AL HAITHAM\* (965 - 1040 AD)



Abu Ali Hassan Ibn al-Haitham was one of the most eminent physicists, whose contributions to optics and the scientific methods are outstanding. Known in the West as Alhazen, Ibn al-Haitham was born in 965 AD in Basra, and was educated in Basra

and Baghdad. Thereafter, he went to Egypt, where he was asked to find ways of controlling the flood of the Nile. Being unsuccessful in this, he feigned madness until the death of Caliph al-Hakim. He also travelled to Spain and, during this period, he had ample time for his scientific pursuits, which included optics, mathematics, physics, medicine and development of scientific methods on each of which he has left several outstanding books.

He made a thorough examination of the passage of light through various media and discovered the laws of refraction. He also carried out the first experiments on the dispersion of light into its constituent colours. His book *Kitab-al-Manathir* was translated into Latin in the Middle Ages, as also his book dealing with the colours of sunset. He dealt at length with the theory of various physical phenomena like shadows, eclipses, the rainbow, and speculated on the physical nature of light. He is the first to describe accurately the various parts of the eye and give a scientific explanation of the process of vision. He also attempted to explain binocular vision, and gave a correct explanation of the apparent increase in size of the sun and the moon when near the horizon. He is known for the earliest use of the camera obscura. He contradicted Ptolemy's and Euclid's theory of vision that objects are seen by rays of light emanating from the eyes. According to him the rays originate in the object of vision and not in the eye. Through these extensive researches on optics, he has been considered as the father of modern optics.

The Latin translation of his main work, *Kitab-al-Manathir*, exerted a great influence upon Western science e.g. on the work of Roger Bacon and Kepler. It brought about great progress in experimental methods. His research in catoptrics centred on

spherical and parabolic mirrors and spherical aberration. He made the important observation that the ratio between the angle of incidence and refraction does not remain constant and investigated the magnifying power of a lens. His *catoptrics* contains the important problem known as Alhazen's problem. It comprises drawing lines from two points in the plane of a circle meeting at a point on the circumference and making equal angles with the normal at that point. This leads to an equation of the fourth degree.

In his book *Mizan al-Hikmah*, Ibn al-Haitham discussed the density of the atmosphere and developed a relation between it and the height. He also studied atmospheric refraction. He discovered that the twilight 44 only ceases or begins when the sun is  $19^\circ$  below the horizon and attempted to measure the height of the atmosphere on that basis. He also discussed the theories of attraction between masses, and it seems that he was aware of the magnitude of acceleration due to gravity.

His contribution to mathematics and physics was extensive. In mathematics, he developed analytical geometry by establishing linkage between algebra and geometry. He studied the mechanics of motion of a body and was the first to maintain that a body moves perpetually unless an external force stops it or changes its direction of motion. This would seem equivalent to the first law of motion.

The list of his books runs to 200 or so, very few of which have survived. Even his monumental treatise on optics survived through its Latin translation. During the Middle Ages, his books on cosmology were translated into Latin, Hebrew and other languages. He has also written on the subject of evolution a book that deserves serious attention even today.

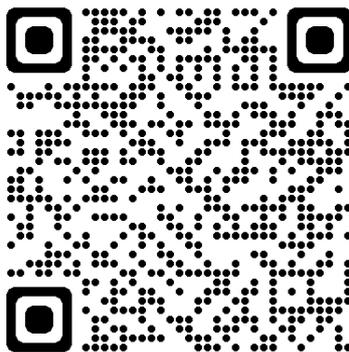
In his writing, one can see a clear development of the scientific methods as developed and applied by the Muslims and comprising the systematic observation of physical phenomena and their linking together into a scientific theory. This was a major breakthrough in scientific methodology, as distinct from guess and gesture, and placed scientific pursuits on a sound foundation comprising systematic relationship between observation, hypothesis and verification. Ibn al-Haitham's influence on physical sciences in general, and optics in particular, has been held in high esteem and, in fact, it ushered in a new era in optical research, both in theory and practice

\* Source: *Personalities Noble*, 2<sup>nd</sup> Edition, 2000, Edited by Hakim Mohammed Said, published by LAS with permission of Hamdard Foundation Pakistan.

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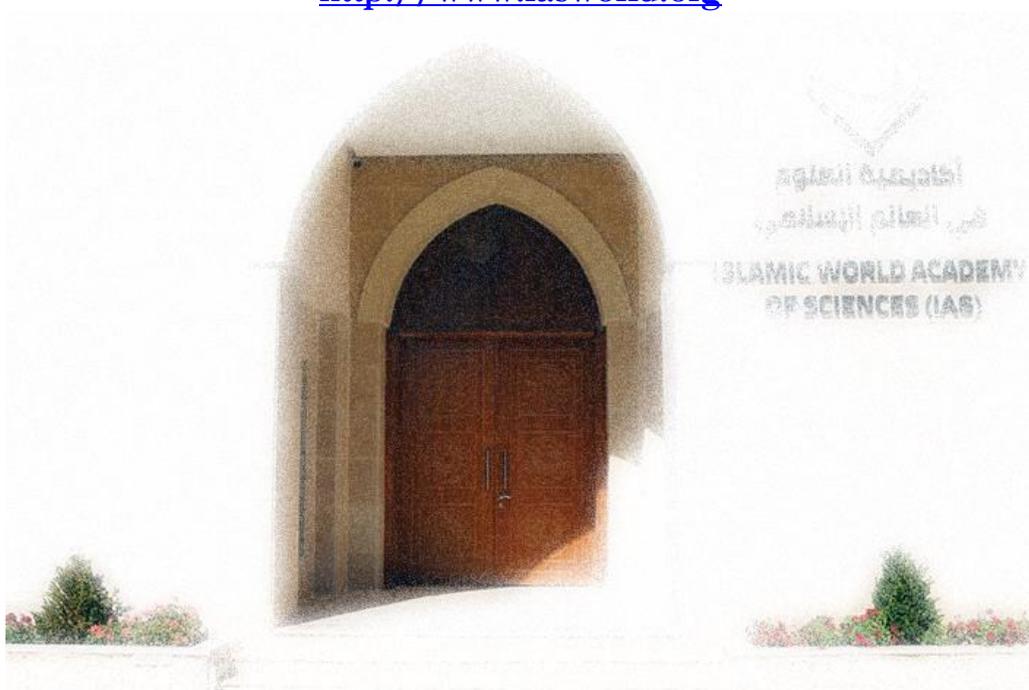
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