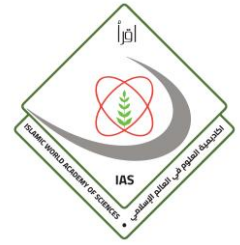


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HRH PRINCE EL HASSAN BIN TALAL LAUNCHES WATER-ENERGY-FOOD NEXUS*

Prince calls for establishing regional water, energy community connecting Mashreq countries.



HRH Prince El Hassan, attends the launching of the third edition of the Water-Energy-Food Nexus Conference (Petra photo).

His Royal Highness Prince El Hassan bin Talal, chairman of the Higher Council for Science and Technology (HCST) and Founding Patron of the Islamic World Academy of Sciences (IAS), attended the launch of the 3rd edition of the Water-Energy-Food Nexus Conference.

The two-day event was co-organised by the University of Jordan and the German Agency for International Cooperation, the Jordan News Agency, Petra, reported.

In his opening remarks, Prince Hassan stressed the importance of involving stakeholders and local communities in developing strategies to address the challenges related to water, energy, food and environmental systems.

The prince also emphasised the need to foster a sense of citizenship and belonging through collective action.

Citing World Bank data, Prince Hassan highlighted that 40 percent of the world's

population faces water scarcity, with projections that by 2040, one in four children will live in regions facing "acute" water scarcity.

Reports from the Food and Agriculture Organisation draw attention to the need to increase food production by 70 per cent by 2050 to meet the needs of a projected global population of 9.7 billion while reducing the environmental footprint of agriculture, he added.

The prince also advocated the creation of a regional water and energy community that connects the Mashreq countries, drawing parallels with the European Coal and Steel Community model.

He also called for prioritising human settlement and dignity, alongside maximising societal investment to promote stability and economic modernisation and ensuring an equitable distribution of benefits across regions.

His Highness also referred to the repercussions of the war against Gaza, including the impact on the Gazans, as well as critical sectors such as agriculture, water, energy and food security.

Acting German Ambassador to Jordan Florian Rendel stressed the need for a clear methodology to address Jordan's water resource challenges in the face of increasing demand.

*Source: <https://jordantimes.com/news/local/prince-bassan-launches-water-energy-food-nexus-conference> - Mar 06, 2024.

AGENDA 21: RESOURCES FOR DEVELOPMENT

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President, Islamic World Academy of Sciences and President, Arab Academy of Sciences



Agenda 21 at the UN Conference at Rio (June 1992) addresses a broad range of issues on sustainable development. It is the outcome of the preparatory committee of the Member States and the UN system which worked with UNCED Secretariat extensively to produce it as an agenda for action for the 21st century by all governments of the world with the support of the UN system and their NGO partners.

The UNCED Secretariat estimated the cost of implementing Agenda 21 for sustainable development in developing countries: of the total amount required each year, some 80% or US\$ 500 billion will have to be provided by developing countries themselves. The remaining 20%, US\$ 125 billion required annually must come from industrialized countries. US\$ 55 billion is already provided by the present levels of ODA, so an additional US\$ 70 billion

would be required from the industrialized countries. While this sum may appear large, it could be raised if industrial countries met the long-established ODA target of 0.7% of their GNP to assist development in the developing countries.

These new financial resources should not be viewed in traditional foreign aid, terms; they represent an investment in global environmental security.

For this purpose, the Rio Conference adopted the establishment of GEF (Global Environmental Facility) which is a form of a Green Fund to be managed by the World Bank, UNDP and UNEP to finance the implementation of Agenda 21. But no concrete commitments were made yet for the total requirements of the total package.

UNESCO and UNCED Follow-Up

The core of the problem about degradation of the environment is stated by **Di Castri**, UNESCO Coordinator for the Environment: **"The greenhouse effect, depletion of the ozone layer, deforestation, desertification: the facts are there, tangible, indisputable. Despite the evidence before our very eyes, we cannot bring about the changes necessary to halt or even slow down the damage. It's as if we did not want to see, hear or understand; as if we preferred to remain in ignorance rather than react. What a paradox!"**

Humanity is therefore living with a paradox: it is certain that apathy or sporadic and incoherent explosions of activity, will lead us to catastrophe, yet this certainly does not rid us of our impotence and paralysis. This paradox, at the heart of the environmental crisis, is so acute that it can't be explained by circumstantial factors, such as lack of funds, but rather by structural problems. Environmental problems completely ignore borders, whether they be between nations or scientific disciplines: interdisciplinary approaches, involving not only natural sciences but also social sciences, and cooperation among communities of scientists throughout the world are the only way that environmental research can leap ahead. Yet scientists who want to work like this are faced with major obstacles. Specialization and compartmentalization too often confine them to specific".

Also, **Cousteau**, the French pioneer in undersea exploration states: **"The resources of our planet are finite... there is a limit that should not be exceeded, a habitability threshold that must not be crossed."** (UNESCO Courier, Nov. 1991).

Mechel Batisse of UNESCO in his article **"A partnership with nature"** states:

¹ *Biologist, Professor and Chancellor of University of Petra, Jordan.*

Former Assistant Director General for Science (ADG/SC) & Deputy Director General (DDG) of UNESCO in Paris.

"Five centuries ago, the discovery of the New World proved that the Earth is round. And therefore finite. Paradoxically, the immense extent of the lands thus revealed enabled human beings to persist until our own times in the mistaken belief that the wealth of nature was inexhaustible and that they could continue with impunity to increase their numbers and multiply their need indefinitely".

This is a subject UNESCO knows well and one with which it has been concerned since its inception. It was under UNESCO's auspices that the International Union for the Conservation of Nature (IUCN) was founded in 1948. Around the same time UNESCO launched a scientific program for the study and use of arid regions. In 1961 the Intergovernmental

Oceanographic Commission (IOC) was established in UNESCO in order to promote worldwide cooperation in the study of the seas, their resources, their protection and their influence on the life of the planet. At the same time study was organized on the Earth's crust, its wealth and the natural hazards associated with it. In 1964 the International Hydrological Decade (IHP) was launched to further knowledge and management of the water resources of all countries. Finally, in 1968, UNESCO organized a conference on the rational use and conservation of the resources of the biosphere, from which sprang

the interdisciplinary program on Man and the Biosphere (MAB) which is today at the center of UNESCO activities related to the environment.

UNESCO has thus long been a place of convergence for all those approaches which attempt, through education, science and culture, to reconcile development and environment, and to restore the original partnership between man and nature. (The UNESCO Courier, Nov. 1991)

The Greenhouse Effect and Climate Change

The OECD-WRI table gives a clear picture of the contribution to the Greenhouse Effect by each of the five major gases and by the four major sectors of the world economy, as shown in the table.

Contribution of Greenhouse Gases by Sector (%)						
CO2	CFC	CH4	O3	N2O	Total	
Energy	35	-	4	6	4	49
Deforestation	10	-	4	-	-	14
Agriculture	3	-	8	-	2	13
Industry	2	20	-	2	-	24
% warming by gas	50	20	16	8	6	100

Nearly half (50%) of the emission causing the global warming is that of CO2 and in the sectors, energy generation emits 35%, the largest share of all CO2 emission. We can also see from the total column of the table that energy generation is responsible for half (49%) of all greenhouse gases. Thus, the most important gas is CO2 and the most important sector Energy.

The simplest strategy, therefore, from this point of view would be the one which would have the effect of restricting CO2 emission and of greater efficiency in energy use. The lower the energy consumption the less greenhouse gases emitted. Energy consumption can be lowered either by lowering the rate of GDP growth (or even through negative growth of GDP, some environmentalist argues for such a policy) or raising GDP but proportionately raising even more the energy efficiency of each unit of GDP.

Green economy may be the gradual solution through increasing renewable resources of energy and gradual decrease of fossil-fuel sources of energy.

Science and technology should find a solution for sequestering it or converting emitted carbons through H2O and hv-(E-Solar) to carbohydrates-food for nutrition.

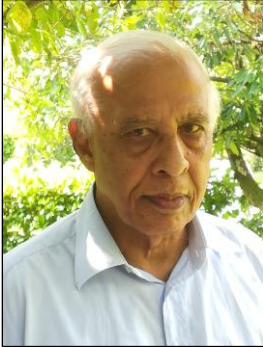
As a scientist, we have to imitate **photosynthesis** in nature by absorbing CO2 particularly simulating what is in **Hill's light reaction** and **Calvin Dark reaction**.

Then the problem of greenhouses gases become a solution to food crisis and contribution to food security on our planet.

Finally, I wish to end this paper with a citation from Victor Hugo: **"There is no force greater than that of an idea whose time has come."**

DIFFERENT ASPECTS OF COSMOLOGICAL CONSTANT

Muhammad Asghar FLAS*



1. Einstein field equations.

Einstein's field equations (EFE) of general theory of relativity are:

$$\mathbf{R}_{\mu\nu} - 1/2 \mathbf{R} \mathbf{g}_{\mu\nu} + \Lambda \mathbf{g}_{\mu\nu} = \mathbf{k} \mathbf{T}_{\mu\nu}, \quad (1)$$

where $\mathbf{R}_{\mu\nu}$ is the Ricci curvature tensor; \mathbf{R} is the scalar curvature; $\mathbf{g}_{\mu\nu}$ is the metric tensor; $\mathbf{T}_{\mu\nu}$ is the stress – energy tensor; Λ is the cosmological constant; and \mathbf{k} is the Einstein gravitational constant = $8 \pi G / c^4$, where G is the Newtonian gravitational constant, and c is the velocity of light in vacuum.

The EFE represented by the relation (1), have a special property: the expression on its left side without the term with cosmological constant Λ that was added by hand by Einstein to achieve this certain end (see below) and is not an integral part of these EFE, represents the spacetime curvature as determined by the metric used, and the expression on the right side of it represents the stress- energy-momentum content of spacetime. The EFE can be considered as a set of equations dictating how stress-energy-momentum determines the curvature of spacetime.

The EFE (1) along with the *geodesic equation* which controls how freely falling matter moves through spacetime, form the core of the mathematical formulation of general relativity.

The EFE (1) along with the *geodesic equation* which controls how freely falling matter moves through spacetime, form the core of the mathematical formulation of general relativity.

2. Cosmological constant Λ

The original EFE (1) without the term of cosmological constant Λ , represents a dynamical and expanding universe. However, the general prevalent idea was that the universe is static. To achieve this end, Einstein added the term of cosmological constant Λ . The Λ considered an independent parameter can be moved to the other side of equation (1) and incorporated as a part of the stress-energy tensor:

$$\mathbf{T}_{\mu\nu}^{(vac)} = - (\Lambda/\mathbf{k}) \mathbf{g}_{\mu\nu} \quad (2).$$

The relation (2) ensures that the expanding universe is reduced to a static one by the presence of the term with Λ . Here, the tensor describes a vacuum state with energy density ρ_{vac} and an isotropic pressure p_{vac} that are fixed and given by $\rho_{vac} = - p_{vac} = \Lambda / \mathbf{k}$. The negative pressure opposes the expansion of the universe.

If the universe is expanding without any hinderance, the $\Lambda = 0$ in relation (2)), and this is the general opinion.

In the expanding universe, there is a linear relation between the recessional velocities of the receding bodies such as stars or galaxies and their distances from the observatory on the Earth according to the Hubble law (Fig.1):

$$\mathbf{v} = \mathbf{H} \mathbf{d} \quad (3),$$

where \mathbf{v} is the recessional velocity of the receding body determined through the red shift of a characteristic EM signal from it; \mathbf{d} is the distance of the body from the observatory on the Earth, and the proportionality constant \mathbf{H} is the Hubble constant with the present-day average value: $H_0 = 71 \text{ km/sec/ mpc}$, where $\text{mpc} = \text{mega par sec in cosmology} = 3.26 \times 10^6 \text{ light years} = 3.09 \times 10^{19} \text{ km}$.

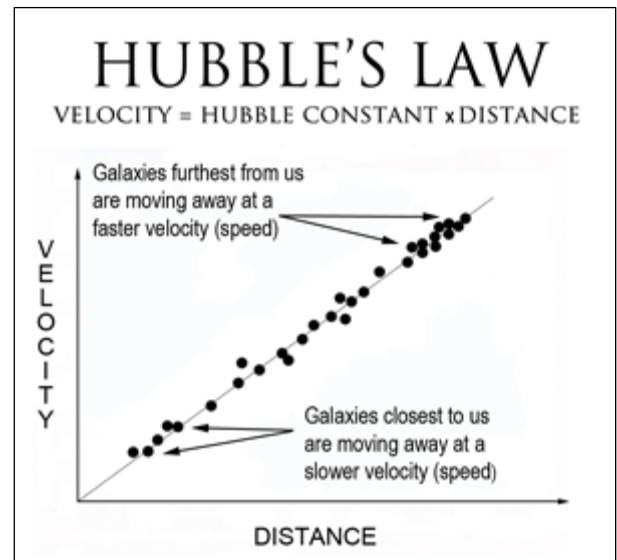


Fig. 1. The linear relation between the recessional velocities of stars or galaxies determined through the red shift of their characteristic EM signals, and their distances from the observatory on Earth (1).

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3. Expansion of the universe through the luminosity of supernova 1a.

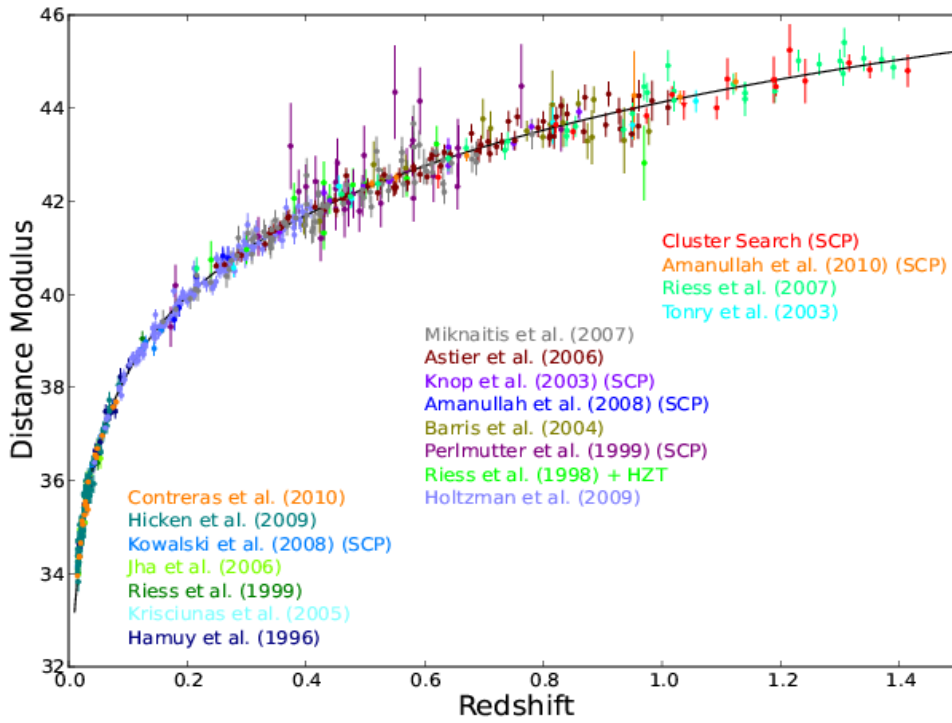


Fig. 2. The distribution of the red shifts, hence, the recessional velocities against the luminosity distances for different supernovae 1a (2).

The supernovae 1a act as “standard candles” with well-known luminosity assumed to be emitted isotopically. By measuring their luminosity reaching an observatory on the Earth and using the inverse-square law along with any needed corrections, one gets their distances called the luminosity distances. Again, the recessional velocities are obtained

through the red- shifts of their characteristic EM signals. Fig. 2 presents the relation between the red- shifts, hence, recessional velocities and the distance for different supernovae 1a. One observes immediately the absence of the linear relation of the Hubble Law. In fact, here, the Hubble constant H is changing along the curve for different supernovae 1a, which clearly indicates that the universe is not expanding uniformly, but its expansion rate is accelerating.

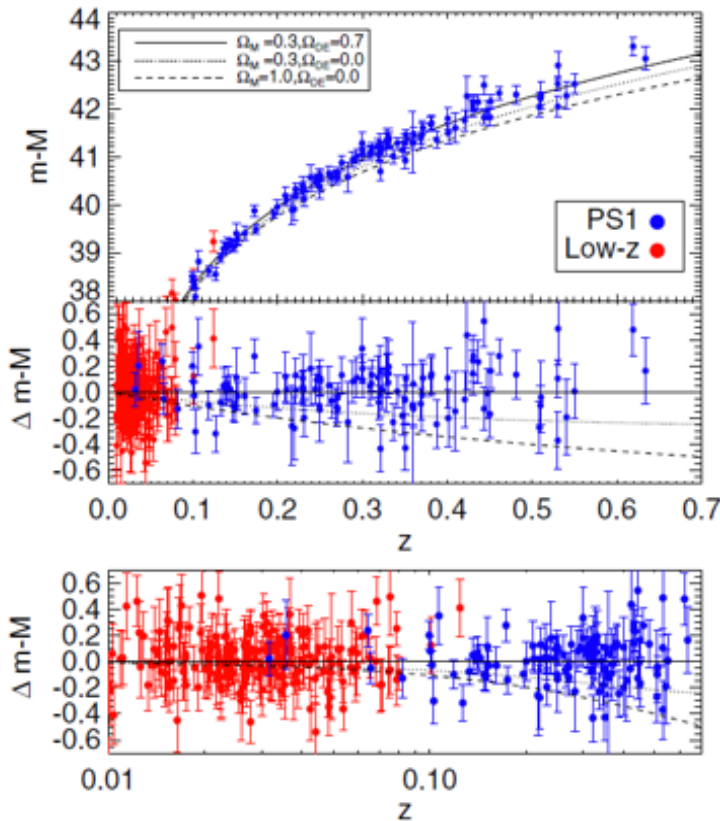


Fig. 3. Hubble diagram for the combined PS1 ($m - M$) data and the red-shift sample, and the residues $\Delta(m - M)$ against the red-shifts (3).

In Fig. 3, the y-axis is the difference ($m-M$) between the apparent magnitude of distance obtained assuming the validity of the Hubble Law and the absolute magnitude of luminosity distances of the supernovae 1a, presented against the z red-shifts resulting in the recessional velocities.

A model fit to these data leads for an accelerating expansion of the universe to a positive value of the cosmological constant $\Lambda = 10^{-35} \text{ s}^{-2} = 10^{-52} \text{ m}^{-2}$.

The existence of a cosmological constant is thus equivalent to the existence of a vacuum energy and a pressure of opposite sign. This has led to the terms "cosmological constant" and "vacuum energy" being used interchangeably in general relativity.

In the different 2.725°K -cosmic microwave background (CMB) data analysis based on the cosmological model ΛCDM , the positive value of Λ is identified with the dark energy that amounts to 68.3 % of the total mass-energy content of a flat universe from the Planck satellite data. Moreover, this analysis is subject to the cosmological principle that lays down that the universe's contents are distributed homogeneously and isotopically. However, if the universe is *lumpy* with high- and low-density regions, then, the corresponding different values of gravitational time dilation may simulate this apparent expansion acceleration though contested (4), but always in the context of the Einstein's Field Equations.

4. Conclusions.

This contribution treats the different aspects of the cosmological constant in the context of an expanding universe and a universe with an accelerated expansion.

References

1. *Courtesy Wikipedia.*
2. *Image courtesy of the Supernova Cosmology Project. Dots are supernovae, vertical lines are the associated errors.*
3. "Cosmological constraints from the measurements of type 1a supernovae discovered during the first 1.5 years of the Pan-starrsi survey". A. Rest et al. arXiv: 1310.3882v2 [Astro-ph. Co]31 Aug. 2014.
4. "Lumpy universe called into question", December 19, 2013, *Physics 6*, s160.

100th Anniversary of the Republic of Türkiye



“The Republic of Türkiye is an enormous treasure that has been passed from hand to hand, from heart to heart and from generation to generation for thousands of years”

President Erdoğan in his address on the Republic of Türkiye's 100th Anniversary.

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<https://www.tuba.gov.tr/files/yayinlar/newsletter/T%C3%9CBA%20Newsletter%202014.pdf>

CYMOPOGON WINTERIANUS (JAVA CITRONELLA PLANT): A MULTI-FACETED APPROACH FOR FOOD PRESERVATION, INSECTICIDAL EFFECTS, AND BREAD APPLICATION¹

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Abstract

Certain plants like *Rosemarinus officinalis*, *Lavandula angustifolia* and *Origanum vulgare* have been used in the food industry for centuries. *Cymbopogon winterianus* (Java Citronella plant) is one of the most significant plants. The objective of this study is to screen for secondary metabolites by phytochemical screening, evaluate the antioxidant contents of extracts and investigate the use of the Java Citronella plant in food preservation and as an insecticide. Java Citronella powder was added to bread and evaluated for its moisture content, and a visual and sensory analysis was performed. *Sitophilus granarius* (L.) weevils were exposed to Java Citronella essential oil (JCEO).

The phytochemical screening revealed that the extracts were abundant in secondary metabolites. The JCEO had a yield of 0.75%.

The aqueous extract had a higher total phenolic content of 49.043 ± 0.217 mg GAE/g than the ethanolic extract, which was 24.478 ± 1.956 mg GAE/g. The aqueous extract had a total flavonoids content $27,725.25 \pm 54.96$ µg RE/g higher than the ethanolic extract, with $24,263 \pm 74$ µg RE/g. The ethanolic extract had stronger antioxidant activity, with an IC₅₀ = 196.116 µg/mL higher than the aqueous extract at 420 µg/mL. The 2% Java Citronella powder in the bread was preferred by consumers, and had a shelf life of 6 days. JCEO killed all the weevils with a high dose of 10% after 48 h. The Java Citronella showed insecticidal and food preservative activity. The results should help in future research to enhance the applications of Java Citronella in various domains, from food technology to insecticides.

¹ Link to the whole publication:

<https://www.mdpi.com/2304-8158/13/5/803>

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EFFECT OF FILTRATE SOME FUNGI ARE FORTIFIED WITH MICRONUTRIENTS TO COMBAT POWDERY MILDEW ON CUCUMBERS

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Abstract:

This study was carried out to detect the distribution of powdery mildew disease in some areas of Babylon governorate to evaluate the efficiency at biofungl filtrates of *Trichoderma harzianum*, *Trichoderma viride*, *Aspergillus niger*, *A.terreus*. 1. *A. terreus*. 2. *Penicillium griseofulvum*, *P. simplicissimum* supplemented with micronutrients in inhibition of pathogenic fungus *Erysiphe cichoracearum* and *sphaerotheca fuligina* which is the causative agent at powdery mildew in cucumber *cucumis sativus*.

The results of field survey that happened in six locations including cucumber plant regions showed spreading of powdery mildew in all locations that the survey covered, the variety (Babylon) has a superiority in percent of infection and its severity for two seasons in autumn and spring. It became 46%, 20 %, 25.6 % and 9.6 % in succession. While the variety (thamin) is the least variety in percent for infection and its severity for two seasons autumn and spring 31 %, 13.6 %, 15.5 % and 5.9% in succession. Also results of infection test of cucumber variety (Babylon) indicated high sensitivity by the causative of the powdery mildew for the inoculums from squash and cucumber and the appearance of disease symptoms is similar to those in the above varieties. The result of different concentrations of micronutrients effect in cucumber plant growth criteria indicated that the nutrients significantly increase the length of root and shoots leaf area, number of leaves and the dry and wet weight compared with the control the highest increase was at 3ml/L concentration, meanwhile the concentric, of 5 ml/L causes damages in the plant through the draughting a yellow bile.

Results of biological fungus filtrates indicated the inhibition of the powdery mildew with of 50% for some fungus filtrates such as A.n, A.t, P.g, meanwhile the filtrates of P.s., A.t, T.v. and T.h. anoint induce any significant decrease in the number of pathogenic spots whereas the highest rate of inhibition was with A.n. filtrate with a rate at 84.983% after the second spray followed by the P.g. filtrate of 57.281. Also, results of three filtrate with a concentration of 50% that the whole fungus filtrates under study induces a significant decrease in pathogenic spots of powdery mildew with 20,30,40% concentrations, meanwhile, no effect on inhibition by fungus filtrates were induced with 10% concentration, and the highest inhibition rate was induced with the concentrations of 20,30,40 % A.n. filtrate with a rate of 74.015 % 60.005% and 59.085% respectively.

Results of adding nutrient mineral to the(PSA) indicated that all concentrations of the mineral cause a Significant increase in fungus growth with a positive relation with increasing the concentration, meanwhile the concentration of 3ml/L causes the highest rate of the three fungus stimulation rate compared with the control mean while the stimulation rate was 40.260., 32.270 and 28.82% for fungus A.t.l, P.g. and A.n. respectively Results of nutrient compound effect study with 3ml/L inhibit powdery mildew disease. the mineral compound causes inhibition rate with clear significant differences compared with the control which is between 50.570-56.335% after the first spraying and increased to 60.765/64.068% for the second spraying with significant differences from the control treatment, meanwhile, the three spraying treatment causes inhibition rate (69.845%), interaction results between mineral compound nutrients 3ml/L and biological fungus filtrate A.n., p.g A.t.1. for the concentration of 20, 40,30% caused the domineers of fungus filtrate A.n mineral nutrient compound .with the concentration of 40% meanwhile the first inhibition rate was 82.60% and the second was 84.482% followed by the filtrate of p.g A.t.l. with the conscentration30% A.n. filtrate was dominate with inhibition rate of 61.85, 75.67% with the concentration 20.

Also interaction between A.n. filtrate and mineral nutrient inhibition rates of 55.083 - 66.366% these results prove that fungus filtrate efficiency increases with mineral nutrients compound also A.n. filtrate alone or with mineral nutrient effect cucumber growth criteria the concentrations 20, 30, and 40 of fungus filtrate caused Significant increase in all criteria growth for periods 45 on 60

days from addition, and the concentration of 2% dominate in the rates of wet and dry weights and the length for the two groups shoots and roots, but in relation for interaction treatments of (A.n. filtrate + mineral nutrient compound), the concentrations 20,30,40% increased the cucumber growth criteria for the dry, wet weight and the length for the shoots and roots comparing with the control, also the concentration 20% was dominated for the above criteria, also results of A.n. filtrate which was grown in (P.S.A.) with mineral nutrients indicated that the concentrations of 10,20,30,40% did not cause effects on inhibition, while the highest inhibition rate was after the second spraying for the concentration of 40% which was 15.728%, which is Low rate comparing with the previous results.

Results of A.n. filtrate (40%) effect on pathogenicity inhibition for the pathogenic fungus, in which the fungus filtrate inhibits the pathogenic fungus for ten days from the treatment. This result agrees with the results of using A.n. filtrate as a protective agent because it provided cucumber leaf protection from the infection by the causative agent with significant differences compared with the control in which the number of spots was zero for ten days of contamination, while the dis. water treatment causes three spots/plant after five days of contamination.

Results of 40% A.n. filtrate test with and without sterilization that both of them had inhibition effect on rates of pathogenic spots number, and the non-sterilized fungus filtrate caused high inhibition decreased to 32.782 compared with the non-sterilized filtrate 78.965%. Also results of 40% A.n. filtrate effect in pathogenic infection rate that filtrate spraying interpret significant decrease in the infection rate between 59.12% -26.55% after the first spraying and rate of infection was decrease after the second spray with rate of 15.180% comparing with the control in which the infection percent was increased and approach 51.57% , also the 40% fungus filtrate was efficient in the inhibition rate of leaf infection area rate in which the infection area decreased from 68.75 cm² before spraying to 31,25 cm² with inhibition rate of 53,78 after the first spraying also the infection area was decreased to 12 cm² after the second spraying comparing with the control in which the leaf infection area was increased to 83.75 cm²/leaf Results of 40% A.n. filtrate effect from the concentration of 200,400 and 800% indicated that the whole concentration causes inhibition rate with the significant inhibition comparing with the control (distilled water) also the treatment of A.n

filtrate with the concentration of 800% induces the highest inhibition rate after the first spraying Which is 93.385 After the first spraying

Keywords: fungus, powdery mildew, cucumber, leachate, effect of leachates, fungal disease, mineral elements.

Introduction

The cucumber plant, *Cucumis sativus* L., belongs to the cucurbit family (Cucurbitaceae). Its native habitat is north of India, so the suitable climate for it is hot and humid. Cucumber is a summer vegetable crop and is grown across the country in two spring and fall seasons, in addition to being one of the important crops in protected agriculture. The fruits contain a high percentage of water, estimated at about 95.1%. Cucumber contains 19 calories, 340 mg of carbohydrate, 90 mg of protein, 25 mg of calcium, 27 mg of phosphorus, 1.1 mg of iron, 160 mg of potassium, 11 mg of ascorbic acid, and 250 international units of vitamin A in every 100 grams of fruit.

Cucumbers are susceptible to infection with many agricultural pests, such as insect, fungal and bacterial pests, and one of the most important fungal diseases that have spread in the country is powdery mildew in cucumbers, which is caused by the fungi *Sphaerotheca fuliginea* and *Erysiphe cichoracearum*. Due to the spread of the two causing fungi in all areas prepared for agriculture and causing severe damage to the crop, the chemical control method was followed because it gives Quick results and the damage caused by chemical pesticides to the environment, their impact on non-target organisms, human health, and the emergence of strains resistant to the action of pesticides [1,2]. Efforts focused on revealing the close relationship between the infection of plants with pathogens and mineral nutrition, and the importance of a number of microelements in resistance to pathogens. Diseases, including copper. [3,4]. Due to the lack of a safe chemical substance, the issue is the farmers' non-compliance with the spraying rates and the period between the last treatment of the chemical pesticide and harvesting the crop, and since the cucumber crop is a fast-maturing crop, there is a high probability of pesticide residues reaching the consumer without reaching the permissible limit. Therefore, this study aimed to Using alternative methods to chemical pesticides, represented by biological resistance. The great successes achieved by the biological fungi *Trichoderma* spp, *Penicillium* spp, and *Aspergillus* spp in the field of biological

resistance to diseases have encouraged many companies to produce many commercial preparations for these fungi. [5,6] To reduce the infection of cucumbers with the fungi *S. fuligina* and *E. cihoraceamm*, and to reduce the impact of pesticide risks on human and animal health and environmental pollution, and due to the lack of studies on the causes of vegetable diseases in Iraq.

The Theoretical Framework of the Study:

Objectives of The Study:

This Study Seeks to Achieve the Following Objectives

This Study, Which Included the Following Topics, aimed to:

Evaluation of the compound of nutrients, alone or combined with the filtrates of the above-mentioned biological resistance fungi, on indicators of cucumber plant growth and resistance to powdery mildew.

the importance of studying:

The importance of this study lies in the effect of the filters of some fungi, enriched with micronutrients, to combat powdery mildew on cucumbers.

Materials and Working Methods:

Field survey of powdery mildew in cucumbers in some areas of Babil Governorate.

A field survey of powdery mildew in cucumber plants was conducted during the fall and spring seasons in some areas of the crop's cultivation in Babil Governorate, namely, Al-Madhatiyah, Al-Qasim, Al-Hashimiyeh, Al-Tali'ah, Al-Kifl, and Al-Hilla Center. The survey was conducted during the months of October, November, and December for the fall season for protected agriculture, and during the months of March and April. As for the spring shoot, three fields were selected from each region, and the area of each field ranged between 3-4 dunams. Then the percentage of infection in one hundred plants chosen randomly from each field was estimated. For the purpose of estimating the severity of the injury, it was calculated according to [167], where the degree of injury was limited to a range ranging between (0-5).

Isolating, growing and preserving pathogenic fungi this test was conducted in the wooden canopy of the Department of Plant Production Technologies, Al-Musayyib Technical College, during the fall season of 2007. Infected leaves of a cucumber plant of the Babylon variety were brought from the field and contaminated with them on the leaves of

healthy cucumber plants, 20 days old, in an artificial way, as fungal spores were dropped from the infected leaf by slight blows on the leaves. The healthy cucumber plants appeared, and after 7 days, symptoms and signs of the disease appeared, represented by white, round spots. The infected plants were re-contaminated reversibly to healthy cucumber plants using the previous method.

Evaluation of the response of Babalon cucumber cultivar to different sources of inoculum for the fungus that causes powdery mildew.

A test was conducted for the pathogenicity of pathogenic fungi in the woody canopy of the Department of Plant Production Technologies - College of Technology during the fall season of 2007. The cucumber variety (Babloon) was chosen, and plastic bags with a diameter of (14 cm) and a capacity of (3 kg) were used. Mixed soil sterilized with methyl bromide gas and left for 15 days to get rid of the disease. The toxic effect of methyl bromide. It was carried out under woody canopy conditions and on October 1, 2007. It was planted at a rate of 2 seeds per bag. The experiment was designed with two treatments. The first treatment in which the plants were contaminated when they were at the age of the fourth true leaf, by inoculating the leaves with conidia of the pathogenic fungus, where a number of cucumber leaves were marked. Zucchini trees and anaki trees infected with the powdery mildew fungus in the field, and then moving the marked leaves with a rapid vibrating motion for the purpose of dropping the old conidia. After 24 hours, I took an infected leaf and placed it on a petri dish, then hit the leaf with slight blows with a glass rod so that the conidia would separate from the surface of the infected leaf. Then, a group of conidia was transferred using a sterile plastic rod, with a piece of soft cotton saturated with water wrapped around it, to the two surfaces of the host leaf, with four replicates for each of the plant hosts. Plants were left unpollinated for comparison, after which reverse pollination took place from the inoculated plants to new cucumber plants. The results were recorded 7-14 days after the date of plant inoculation, giving a sign (+) when symptoms and signs of the disease appeared on the inoculated leaves, and a sign (-) if they did not appear.

Results and Recommendations:

The results of the field survey conducted in six different regions of Babylon Governorate showed that the symptoms of the disease appeared during the autumn season in the second half of October,

and the infection was most severe during the month of November and the first half of December. The infection rate in the Babylon variety exceeded the rest of the surveyed varieties. It reached 46%, while the variety "Thamin" was the least of the varieties, at 31%. As for the average percentage of infection severity, it reached 25.6% in the "Babloon" variety, while its severity in the "Thamin" variety reached 15.5%. As for spring cultivation, the symptoms of the disease appeared in the second half of March, and the infection was most severe during the month of April. The highest percentage rate of infection during the season was in the Babalon variety, 20.6%, followed by the Nickerson variety, at 18%, while the precious variety was the least of the varieties, at 13.6%. As for the average percentage, the percentage of infection severity was that the Babylon variety outperformed the rest of the studied varieties, reaching 9.6%, while the Precious variety was 5.9%.

From observing Tables 1 and 2, it is clear that the rate of infection and its severity on cucumber plants in autumn cultivation is higher than in spring cultivation, and this may be due to the suitability of environmental conditions for the growth and development of the disease [1]. Through continuous monitoring of the development of the disease in the six regions, it was noted that the percentage rate of infection as well as its severity increases on cucumber crops in nearby fields overlapping with areas where cucumbers, zucchini squash, and anaki squash are grown [1].

Isolating, growing and preserving pathogenic fungi: The results showed that the symptoms and signs of disease appearing on the experimental plants were consistent with the symptoms and signs of infected leaves of Babalon cucumber plants taken from the surveyed fields. Because the fungus that causes powdery mildew is an obligate fungus, which cannot be grown in agricultural media because it requires a living plant host, therefore the process of industrial pollution was continued. Healthy cucumber plants under environmental conditions suitable for the growth and spread of the fungus, so that these infected plants can be used for subsequent experiments.

Second: Recommendations:

Introducing the biological fungal filtrate *Aspergillus niger*, *Penicillium griseofulvum* and *A. terreus* into programs for managing powdery mildew on cucumbers.

Conducting laboratory studies on the effective components of fungal filtrate used in biological

resistance, especially the fungal filtrate *Aspergillus niger*, which gave high efficiency in resisting and protecting cucumber plants from the fungus that causes powdery mildew.

Conduct additional studies on the filtrate of biological fungi to know the mechanism of action of each filtrate and the location of its effect on the fungal cell, and thus determine the method and time of adding the filtrate to increase its effectiveness on the pathogen.

Conduct additional studies of the fungal filtrates used in this experiment, especially the fungus *A. niger*, on experimental animals to determine their side effects on the animal cell, so that their use during manufacturing is sound and in compliance with the World Health Organization.

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**PROF. AMEENAH GURIB-FAKIM FIAS
AWARDED THE INTERNATIONAL
WOMAN OF THE YEAR AWARD 2024**



Prof. Ameenah Gurib - Fakim FIAS, received the International Woman of the Year Award 2024. The ceremony took place on 7 March, 2024 at the House of Commons, UK.

The award was handed over by Rt. Hon. Robert Halfon, MP in the presence of Rt. Hon Valerie Vaz, MP, The Mayor of London Mr. Sadiq Khan and many other dignitaries.

Prof. Ameenah Gurib-Fakim has been the Managing Director of the Centre International de Développement Pharmaceutique (CIDP) Research and Innovation as well as Professor of Organic Chemistry with an endowed chair at the University of Mauritius. Since 2001, she has served successively as Dean of the Faculty of Science and Pro Vice Chancellor (2004-2010). She has also worked at the Mauritius Research Council as Manager for Research (1995-1997).

Ms Gurib-Fakim earned a BSc in Chemistry from the University of Surrey (1983) and a PhD from the University of Exeter, UK (1987). During her academic journey, she has participated in several consultation meetings on environmental issues organized by international organizations. Between (2011-2013), she was elected and served as Chairperson of the International Council for Scientific Union - Regional Office for Africa and served as an Independent Director on the Board of Barclays Bank of Mauritius Ltd between (2012-2015).

As a Founding Member of the Pan African Association of African Medicinal Plants, she co-authored the first-ever African Herbal Pharmacopoeia. She has authored and co-edited 30 books, several book chapters and scientific articles in the field of biodiversity conservation and sustainable development. She has lectured extensively across the world; is a Member of the Editorial Boards of major journals, has served on Technical and national committees in various capacities. Elevated to the Order of the Commander of the Star and Key by the Government of Mauritius in 2008, she has been admitted to the Order of the Chevalier dans L'Ordre des Palmes Academiques by the Government of France in 2010 and is the recipient of 5 DSc(s). Elected Fellow of several academies and societies, Ms Gurib-Fakim received several international prizes including the 2007 P'Oreal-UNESCO Prize for Women in Science, the African Union Commission Award for Women in Science, 2009.

On 05 June 2015, she was sworn in as the 6th President and the First Female President of the Republic of Mauritius and served in that capacity until March 2018.

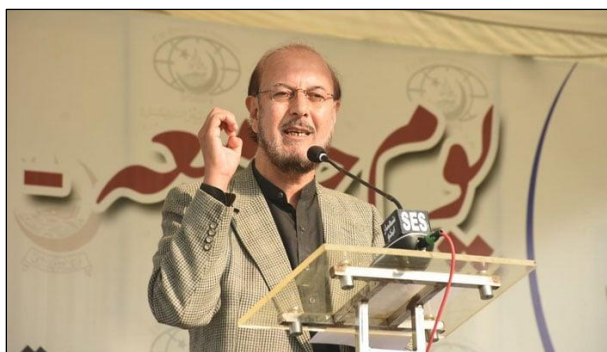
She was elevated to the Order of GCSK by the Government of Mauritius, and received the Legion d'Honneur from the Government of France in 2016. In 2017, she received both the Lifelong Achievement Award of the United States Pharmacopoeia-CePat Award and the American Botanical Council Norman Farnsworth Excellence in Botanical Research Award. In 2018, she received the Order of St George at the Semperopernball, Dresden, Germany. In 2019, she received the 'Trailblazing award for political leadership' by the World Women Leaders Council in Iceland. In 2020, she was elected Honorary President of the International and Engineering Institute and received their 2020 5th IETI Annual Scientific Award.

In 2017 she received the IAS-COMSTECH Ibrahim Memorial Award. In 2021, she received the Benazir Bhutto Lifetime Achievement Award and appointed Distinguished Professor at the John Wesley School of Leadership at Carolina University, USA.

In June 2016, she was in the Forbes List for the 100 'Most Powerful women in the world' and 1st among the Top 100 Women in Africa Forbes List 2017, 2019. She is honored as one of Foreign Policy's 2015 Global Thinkers.

PROF. ZABTA K. SHINWARI

Vice President, LAS & Fellow, TWAS, PAS
**APPOINTED AS VICE CHANCELLOR OF
FUUAST**



The President of Pakistan, in a momentous decision, has appointed **Dr. Zabta K. Shinwari** as the Vice Chancellor of the Federal Urdu University of Arts, Science and Technology (FUUAST), effective March 04, 2024. Dr. Shinwari brings with him a wealth of experience and a visionary outlook to lead FUUAST into a new era of academic excellence and innovation. Dr. Shinwari, a distinguished national professor of Pakistan and educator, remained Vice Chairman: UNESCO-World Commission for Ethics of Scientific knowledge and Technology. Dr. Zabta Khan Shinwari got Ph.D. from Kyoto University (Japan) followed by several Post Doc. Fellowships in Japan. He served COMSTECH before his appointment as Vice Chancellor of Kohat University of Science & Technology. One of his major achievements is to extend higher education facilities to the neglected communities of Pakistan especially to female. He also established University of Science & Technology, Bannu. He is the founder of KUST Institute of Medical Sciences (KIMS). Dr. Shinwari also served private sector as CEO of Qarshi Research International and Vice Chancellor/PD Qarshi University-Lahore. He was President, National Council of Tibb. Also served as **Secretary General, Pakistan Academy of Sciences**, Islamabad.

Dr. Shinwari is poised to steer FUUAST towards greater heights of success and prominence in the academic world.

Vision and Mission:

Dr. Shinwari envisions FUUAST as a beacon of knowledge, fostering intellectual growth, innovation, and societal transformation. His mission is to cultivate an environment of academic excellence, research prowess, and inclusivity, where students and faculty thrive and contribute meaningfully to society.

Dr. Shinwari's vision for FUUAST includes:

Academic Excellence: Striving for excellence in teaching, research, and community engagement.

Innovation and Research: Promoting a culture of innovation and research to address societal challenges and contribute to national development.

Student-Centric Approach: Ensuring holistic development and empowerment of students through quality education, extracurricular activities, and career guidance.

Collaboration and Partnerships: Fostering collaborations with industry, government, and academia to enhance learning opportunities, research endeavors, and job placements for students.

Future Strategy:

Dr. Shinwari is committed to implementing strategic initiatives that will propel FUUAST towards achieving its full potential. His future strategy includes:

Enhanced Academic Programs: Introducing new and innovative academic programs aligned with the evolving needs of society and industry.

Faculty Development: Investing in faculty development programs to enhance teaching methodologies, research capabilities, and professional growth.

Infrastructure and Facilities: Upgrading infrastructure and facilities to provide a conducive environment for teaching, learning, and research.

International Collaboration: Establishing partnerships with renowned international institutions for exchange programs, research collaborations, and faculty/student exchanges.

Call to Collaborate:

Dr. Shinwari extends an earnest invitation to all stakeholders, including faculty, students, alumni, government bodies, industry partners, and the wider community, to collaborate in the uplifting of FUUAST. Together, we can work towards realizing the university's full potential and making significant contributions to the educational landscape of Pakistan.

As Dr. Shinwari assumes the role of Vice Chancellor, he looks forward to embarking on this journey of transformation and growth with the unwavering support and collective efforts of all stakeholders.

About FUUAST:

The Federal Urdu University of Arts, Science and Technology (FUUAST) is a leading institution of higher education in Pakistan, dedicated to promoting excellence in teaching, research, and community service. Established with a commitment to providing quality education in Urdu medium, FUUAST has evolved into a multidisciplinary university offering programs in various fields of arts, science, and technology.

**PROF. ILKAY ERDOGAN ORHAN FIAS
RECEIVES THE
CLIMATE AMBASSADOR AWARD**

The Climate and Human Summit Program was held on 20 March 2024 at the Ankara Chamber of Commerce with the support of the Turkish Ministry of Environment, Urbanization, and Climate Change, the Turkish Industrialists' and Businessmen's Association (TÜSİAV), the Turkish Vegan and Healthy Living Tourism Association (TEVSAD) and the Association for Life. The summit brought together world leaders, experts, and activists to discuss innovative solutions and measures for the future of the world in the face of the threat that climate change poses to humanity and the planet.

As part of the program, the inaugural Climate Ambassador Award was announced, recognizing individuals and institutions that are taking a proactive role in the fight against climate change and making a significant contribution to the cause. This year's award was presented to Prof Dr Ilkay Erdogan Orhan, a faculty member of the Faculty of Pharmacy at Gazi University, former dean, and member of the Islamic Academy of World Sciences (IAS) as well as the Turkish Academy of Sciences. In his speech at the program, Prof. Orhan emphasized the need to preserve nature and leave it as a legacy for future generations, stating that increasing awareness of nature will make people more sensitive to its preservation. This award symbolizes the recognition of leadership and efforts in the fight against climate change and underlines the importance of such initiatives.



**PROF. GELENBE HONORARY FIAS
AWARDED THE HONOR OF
OFFICER OF THE ORDER OF MERIT
OF THE REPUBLIC OF POLAND**



Prof. Erol Gelenbe, Honorary FIAS was awarded the Cross of Officer of the Order of Merit of the Republic of Poland (*Krzyż Oficerski Orderu Zasługi Rzeczypospolitej Polskiej*), by decree of the President of Poland on 12 March 2024. The Order of Merit of the Republic of Poland (Polish: Order Zasługi Rzeczypospolitej Polskiej) is a Polish order of merit created in 1974, awarded to persons who have rendered great service to Poland. It is granted to foreigners or Poles resident abroad. As such it is sometimes referred to as a traditional "diplomatic order".

It is also worth mentioning that Prof. Gelenbe, is listed this year among the 25 Most Influential Scientists and Technologists in the Muslim World in the annual issue of [The Muslim 500: The World's 500 Most Influential Muslims](#). The 25 women and men in the list come from, and/or work in, the Middle East, North Africa, Indonesia, Singapore, Malaysia, Thailand, Iran, India, Pakistan etc.

"Erol Gelenbe studied in Türkiye and the USA, and held Professorships at the University of Liège (Belgium), the University of Paris-Saclay and Paris-Descartes, and named Chairs at NJIT, Duke, the University of Central Florida in the USA and Imperial College London. A pioneer in the field of modelling and performance evaluation of computer networks, the inventor of the random neural network, the G-networks, and the Cognitive Packet Network, he is currently Professor in the Institute of Theoretical and Applied Informatics of the Polish Academy of Sciences, and Chair of the Academia Europaea Informatics Section. Also affiliated with the University of Cote d'Azur, CNRS I3S (Nice), Research Professor at Yasar University, İzmir, Türkiye, and Honorary Professor University of Electronic Science and Technology of China, he has graduated 95 PhDs and received multiple fellowships, awards and honours for his work."

IBN RUSHD* (1128 - 1198 AD)



Abul Waleed Muhammad Ibn Ahmad Ibn Muhammad Ibn Rushd, known as Averroes in the West, was born in 1128 AD in Cordoba, where his father and grandfather had both been judges. His grandfather was well versed in Fiqh (Maleki School) and was also the Imam of the Mosque of

Cordoba. The young Ibn Rushd received his education in Cordoba and lived a quiet life, devoting most of his time to learned pursuits. He studied philosophy and law from Abu Ja'afar Haroon and from Ibn Baja. He also studied medicine.

Al-Hakam, the famous Umayyad Caliph of Spain, had constructed a magnificent library in Cordoba, which housed 500,000 books. He himself had studied many of these and made brief marginal comments on them. This rich collection laid the foundation for intellectual study in Spain and provided the background for men like Ibn Rushd, who lived 2 centuries later.

Abu Yaqub, the Caliph of Morocco, called him to his capital and appointed him as his physician in place of Ibn tufail. His son Yaqub al-Mansur retained him for some time but soon Ibn Rushd's views on theology and philosophy drew the Caliph's wrath. All his books, barring strictly scientific ones, were burnt and he was banished to Lucena. However, as a result of intervention of several leading scholars, he was forgiven after about four years and recalled to Morocco in 1198. He died towards the end of the same year.

Ibn Rushd made remarkable contributions in philosophy, logic, medicine, music and jurisprudence. In medicine his well-known book *Kitab al-Kuliyat fi al-Tibb* was written before 1162 AD. Its Latin translation was known as 'Colliget'. In it, Ibn Rushd has thrown light on various aspects of medicine, including the diagnoses, cure and prevention of diseases. The book concentrates on specific areas in comparison to Ibn Sina's wider scope of *al-Qanun*, but contains several original observations by Ibn Rushd.

In philosophy, his most important work *Tahafut al-Tahafut* was written in response to al-Ghazali's work. Ibn Rushd was criticised by many Muslim scholars for this book, which nevertheless, had a profound

influence on European thought, at least until the beginning of modern philosophy and experimental science. His views on fate were that man is neither in full control of his destiny nor is it fully predetermined for him. He wrote three commentaries on the works of Aristotle, as these were known then through Arabic translations. The shortest *Jami* may be considered as a summary of the subject. The intermediate was *Talkebis* and the longest was the *Tafsir*. These three commentaries would seem to correspond to different stages in the education of pupils; the short one was meant for the beginners, then the intermediate for the students familiar with the subject, and finally the longest one for advanced studies. The longest commentary was, in fact, an original contribution as it was largely based on his analysis including interpretation of Qu'ranic concepts.

In the field of music, Ibn Rushd wrote a commentary on Aristotle's book *De Anima*. This book was translated into Latin by Mitchel the Scott.

In astronomy, he wrote a treatise on the motion of the sphere, *Kitab fi-Harakat al-Falak*. He also summarised *Almagest* and divided it into two parts: description of the spheres, and movement of the spheres. This summary of the *Almagest* was translated from Arabic into Hebrew by Jacob anatoli in 1231.

According to Ibn al-Abbar, Ibn Rushd's writing spread over 20,000 pages, the most famous of which deal with philosophy, medicine and jurisprudence. On medicine alone he wrote 20 books. Regarding jurisprudence, his book *Bidayat al-Mujtabid wa-Nibayat-al-Muqtasid* has been held by Ibn Ja'afar al-Thahabi as possibly the best book on the Maleki School of Fiqh. Ibn Rushd's writings were translated into various languages, including Latin, English, German and Hebrew. Most of his commentaries on philosophy are preserved in the Hebrew translations, or in Latin translations from the Hebrew, and a few in the original Arabic, generally in Hebrew script. This reveals his wider acceptance in the West in comparison to the East. The commentary on zoology is entirely lost. Ibn Rushd also wrote commentaries on Plato's *Republic*, Galen's treatise on fevers, al-Farabi's logic, etc. Eighty-seven of his books are still extant.

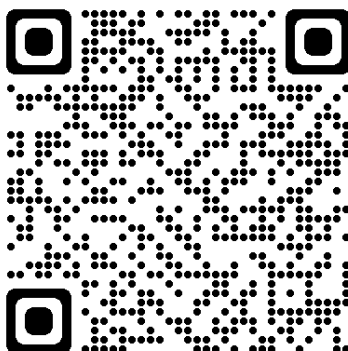
Ibn Rushd has been held as one of the greatest thinkers and scientists of the twelfth century. According to Philip Hitti, Ibn Rushd influenced Western thought from the 12th to the 16th centuries. His books were included in the syllabi of Paris and other universities until the advent of modern experimental sciences.

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

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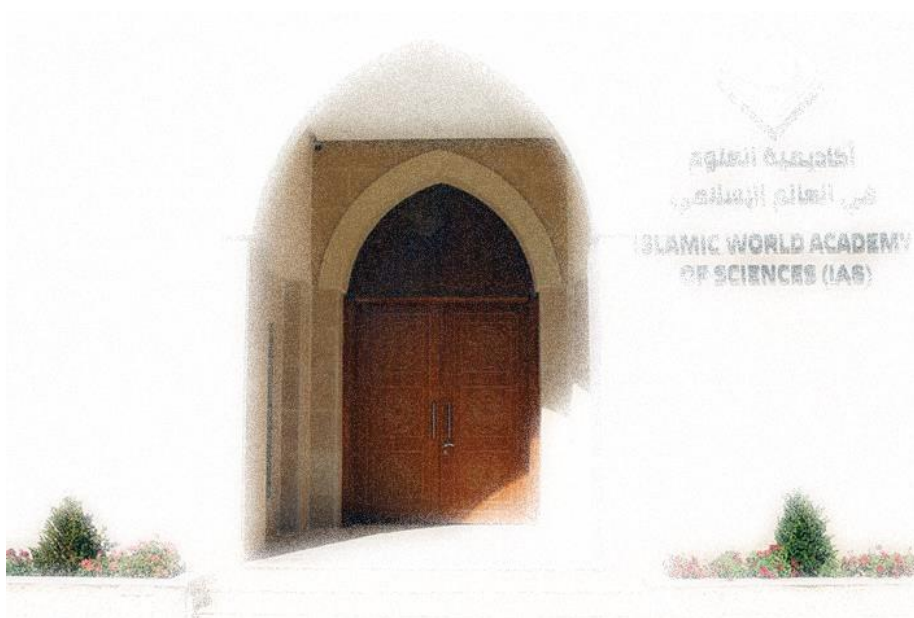
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