Effect of *Peganum Harmala* mixed with silver nanoparticles. and loaded on Nano Activated Charcoal in *Musca domestica* L.

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Abstract

The current study was carried out in the Al-Alam district of Salah Al-Din Governorate, where the study included the effect of the extract of the plants of Haram, a currant, a currant, and a nanoparticle with a sweetener of 0.1%. The analysis of the stimulus analyzes of 0.1 g/L of the insect was carried out in the laboratory of the University of Reit, in the Breeding Department of Girls. SEM measurements of the ultra-thin translucency of the fabricated nanocomposite and extracts of the leaves of the campus *Peganum harmala*, which includes the touch The telescope has an average size of 63.16 nm, and the activity value is very high and very high. TEM (pore sizes 20-100 nm) nanoparticles The extracted water is processed by the nano-metallic processes with a precise load of activated carbon The plantains and larvae of *Musca domestica* are slowed down in a slow manner, due to the delay in treatment, the rate of killing of larvae and the percentage 100% (Hindial is 50%, the percentage is 26.66%), it is 12.5%, it is the Twah method, and the percentage is 100%, it is the colorimetric method. C is 50%, the proportion of balut is 23.33%, and the proportion of Indian is 12.5%. The relationship between filters and the proportion of kills is direct.

Keywords: insecticidal plants, nano-metallic nanoparticles, Peganum harmala extract, Musca domestica larvae, SEM analysis, TEM analysis, nanoparticle synthesis, activated carbon, larvicidal activity, delayed treatment, killing rate, colorimetric method, breeding department, ultra-thin translucency, nanoparticle characterization.

the production of plants Insects (Harborne, 1984) which have high affinity and high affinity for protein complexes that are difficult to digest. Correlation between libido and colostrum stimulation by stimulation (Feeny, 1969). The use of nanotechniques is simple and precise, and is not difficult to use. Ag NP s where they are owned .

Materials and methods.

Insect collection

The adults of the house fly insect were collected from the district of science in Salah al-Din Governorate during the period from 1/9/2022 to 1// 11 2022 and the insect was fed a diet consisting of milk and sugar in a ratio of (1: 1) and dissolved

Introduction:

Musca domestica L. (Diptera: Muscidae) is one of the most famous species of falciparum (2015, John & Hussein; Ommi et al, 410). 2). With the mosques of the Bab al-Mangal, there are many insect treasures and their excavations are widespread all over the world, as well as inside the manajes and the remains of the Bab al-Mangal insect. The city is located in the city, especially in the three areas, where the Niles form the Nile River, where it is located. Also, the remains of the decomposed organic matter and the remains of the animals are recovered from the landfills. Nylon and others, , 4114). Al-Zubaidi and others, 1991 (These are mbered among the second pests that affect

obtaining powder extract and sticky substance (Al-Tikriti, 2001) and stored the extracts in sterile and opaque glass bottles and placed in the refrigerator at a temperature of 5 ° C to be used in future experiments.

Biosynthesis of silver nanoparticles

Biological preparation of silver nanoparticles

Silver nanoparticles were biologically prepared by adding 3 g of silver nitrate in a flask containing 800 ml of ionic distilled water and heated the resulting mixture at a temperature of 80 ° C for 10 minutes, then add the aqueous extract of rue leaves until the color of the solution changed from light yellow to silver and the appearance of the mirror, which indicates the formation of silver nanoparticles, leave the solution for a full day and on the second day pour clear water with a small amount of it left with the precipitate and put in Ultrasonic device for an hour and a half to break down the large particles of the precipitate and filter the mixture with 1 filter paper. Whatman No, dry and store at 4°C until use (Jebril et al, 2020).

Transmission electron microscope

Transmission electron microscopy(TEM)

This type of microscope is used to study the internal contents of the sample, and its work depends on

Energy-dispersive X-ray spectroscopy (EDX)

Both the X-ray energy scattering standards and the scanning electron microscope are similar in principle, they both work by shedding a beam of electrons in the form of radiation heading towards the surface of the sample, but the mechanism of interaction and detection differs between the two measurements as the energy

in 20 ml of distilled water and was placed in Petri dishes and placed in the center of the dish a piece of cotton in order to prevent the adhesion of the insect (Hazfez, ; 1949 Abdel Fattah, 1989). And put the breeding cage in appropriate laboratory conditions at a temperature of (28±2) C and relative humidity (70±5) % until obtaining a colony of the insect for the purpose of study, and then the medium to be laid eggs was prepared and consists of:

1. Ground chicken droppings (600 g)
2. Yeast (22 g)
3. . Wort (200 g)
4. Sodium hydroxide 5 standard (20) ml

1200 . 5 ml distilled water

These ingredients were mixed well and then placed in glass dishes capacity of 1000 ml and then placed in breeding cages in order to lay flies eggs to produce new generations of the insect for the purpose of study, and this process was carried out in appropriate environmental conditions at a temperature ranging between 29-30 ° C (West, 1951), the samples were transferred to the insect laboratory, Department of Life Sciences / College of Education for Girls and recorded all information about the place, date and method of collection and method of treatment.

Preparation of aqueous extracts for plants

The aqueous extracts of the plants used in the study were prepared by placing 100 g of washed leaves in a glass jar of 1000 ml and put 50 ml distilled water not ionic and heated at a temperature of 80 ° C to the point of boiling and then left after boiling for 10-15 minutes and then leave for 20 minutes to cool down after which the solution was filtered by Whatman No.1 filter paper to obtain the aqueous extract, then the extract was dried in an electric oven at a temperature of 60 ° C And

Atomic force microscopy (AFM)

The atomic force microscope is an important measuring tool and has a superior analytical ability, and it is also considered one of the most famous microscopes for measuring, magnifying and moving for the nanolevel of the high power of this microscope, as it shows an image of the sample surface in three-dimensional, two-dimensional, nanoscale and micron.

Preparation of activated charcoal from rue leaves.

Preparation of Raw Material

I took a quantity of rue leaves and washed them with warm water for 30 minutes to get rid of the impurities stuck in them, and then washed with distilled non-ionic water three times and dried in an electric oven (drying oven) at a temperature of 80C0)) for four hours to get rid of moisture (Figure: 1).

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it 50 ml of HCl solution at a concentration of (0.1M) to remove the chemical residues and mixed well and placed in the burning oven again for two hours and at a temperature of (500C0) (Fig. 2).

3. The coal mixture was extracted from the burning furnace and cooled at room temperature and then washed several times with non-ionic distilled water to get rid of dispersion works on the basis of irritation of the target radiation-absorbing atoms, and then emitting these atoms of radiation of different wavelengths and according to atomic numbers emit distinctive radiation for each atom that differs from the radiation of another atom, and these rays are detected With special reagents equipped with base materials that serve as a reference for each irritated atom present in the sample (Bergstrom, 2015).

Scanning Electron Microscopy (SEM)

Scanning electron microscopy is used to determine the surface structure and estimate the geometric shapes of the sample under study in the morphological study of the shape and structure of the sample by shining an electron beam on the surface of the sample after its initialization and knowing the reaction resulting from the incident ray and the surface of the sample, which gives clear images of the particle shapes of the sample under test (Zhou et al, 2006).

Figar (1)(A) Peganum harmala leaves are complete (B) leaves powder

Charting and chemical activation processes (Sara, 2021).

1. Weighing 100 g of crushed leaves of the rue plant after being completely free of moisture and then placed in the burning oven for three hours at a temperature of (550C0).

2. After that, it was left to cool and then taken out of the burning oven and added to

sifted in order to obtain a fine powder of nano-activated charcoal.

5. The prepared coal was characterized by atomic force microscopy, X-ray diffraction and X-ray energy scattering spectroscopy.

larvae were followed up on a daily basis until the emergence of adults, and then according to the number of larvae, pupae and dead camels.

. **Treatment by feeding method**

This treatment relied on the method adopted by (Wright, 1971), where a sample of 1 g of sterile industrial food was placed in dishes containing the same concentrations used in the immersion method, but in the control treatment was used industrial food is not treated, and 10 larvae were placed in the dishes and covered from the top with a piece of gauze, then incubated at a temperature of 27 ° C, relative humidity of 70%, and a period of illumination of 16 hours of light and 8 hours of darkness, and conducted The experiment was 3 repeats per concentration, and the same number for the control treatment, and the growth and development of the larvae were followed up on a daily basis until the emergence of the adult and then according to the number of larvae, adults and pupae .

Results, discussion

Silver nanoparticles from *Peganum Harmala*. leaf extract

The results showed the formation of silver nanoparticles from the extract of rue leaves, as the particles were determined by the formation of a silver precipitate at the end of the reaction, and this precipitate resulted from the reduction of silver ions present in the silver nitrate solution AgNO3 and the formation of silver

HCl acid residues and filtered several times to remove acid and base residues in order to obtain a neutral function by measuring the filtrate with a device (pH meter).

4. The activated charcoal prepared at 80C0 was then dried for three hours and then

Figure(2) : An iron reactor for making rue powder **Peganum harmala** at a temperature of 550 C

The nanocarbon nano was prepared from an inexpensive and available raw material (rue leaves) and the prepared material was diagnosed by different techniques, including transmission electron microscopy (TEM), X-ray energy scattering (EDX) and atomic force microscopy (AFM).

1-Treatment by dipping method

Treatment by immersion method tested the biological activity by adopting the method he mentioned

(Sinthusiri & Soonwera, 2010) as 10 larvae were taken and immersed in 10 cm in each of the solutions prepared in the above concentrations for 30 seconds, while the control treatment was immersed in the larvae with distilled water, then transferred to petri dishes containing 1 g of sterile industrial food and placed in the incubator at a temperature of 27 ° C and relative humidity of 70% and a period of illumination of 16 hours of light and 8 hours of darkness, and the experiment was conducted by 3 repetitions for each concentration in addition to the control treatment The growth and development of

the eucalyptus tree and characterizing them with different techniques.

In view of this high susceptibility of nanoparticles of activated charcoal, according to the aforementioned studies, in the processes of adsorption of various materials, the idea came to use it to load pesticides and plant extracts on its surface and use it to control harmful insects, including house flies.Identification of the prepared nanomaterials:

Scanning Electron Microscope Diagnosis: (SEM) scanning electron microscope

It is one of the types of electronic microscopes, through which the surface of the sample is photographed using a torrent of electrons, and it gives complete information about the topography of the surface and composition of the prepared material from Peganum Harmala, where the scanning electron microscope plays a major role in understanding the nature of the prepared material.

Where the results of the examination using the scanning electron microscope show a noticeable variation in the size of the particles of the biosynthetic material, as well as a variation in the pore size and craters appearing on the surface of the prepared material, which is a feature of the nanosize. Possible surface area for contact with the substance to be adsorbed and targeted, the results of the examination using the scanning electron microscope showed in figures (3 and 4) that the silver nanoparticles, which were synthesized from the leaf extract of Peganum Harmala, under the power of magnification of 1 micrometer, appeared in the form of sticky herical clusters, as shown in Figure (5) with an average size of particles of 63.16 nm, and this is consistent with what was nanoparticles in the presence of an aqueous medium, as the rue extract works as a reducing agent and a producer of particles Silver nanoparticles at the same time, and this is due to the presence of active particles in the aqueous extract of rue, which led to the reduction of silver ions to silver nanoparticles and reaching a stable state, and this is consistent with (Ider et al, 2017).

Composition of activated charcoal nanoparticles and its various uses:

Activated nano-charcoal particles were formed from environmentally friendly materials, which are the leaves of the rue plant, and used to load the extract of the rue plant and nano-silver particles on its surface, after which the larva was treated with it. An environmentally friendly plant and its use in the treatment of polluted industrial water, and it diagnosed coal using many techniques such as (FT-IR, SEM, TEM, EDX, and BET), and this is similar to the results of the current study, as well as the study (Yaseen and alwan, 2022), where they prepared coal particles Nanoactivator and its use in the removal of tamoxifen due to its high adsorption capacity, and a study (Abd AL-hadia and alwan, 2020), where they prepared nano activated charcoal from pomegranate peel and used it in the adsorption of methylene blue from its aqueous solution, as well as a study (Abdullah et al , 2020) in their study of the thermodynamics and kinetics of the adsorption of black eriochrome on activated charcoal prepared from lemon leaves, and the study of (yaseen and alwan, 2020) in their study of the thermodynamics of the adsorption of tamoxifen by activated charcoal nanoparticles prepared from the stem of

possibility of biosynthesis of nanoparticl mentioned by (Youssef, 2022) in the from the extract of rue leaves.

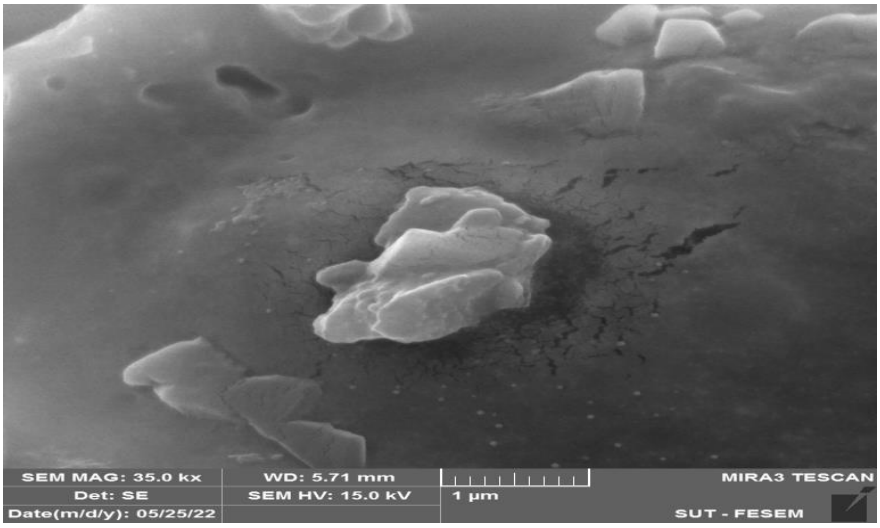


Figure (3) Silver nanoparticles prepared by mixing with rue extract at a magnification of 1 micrometer

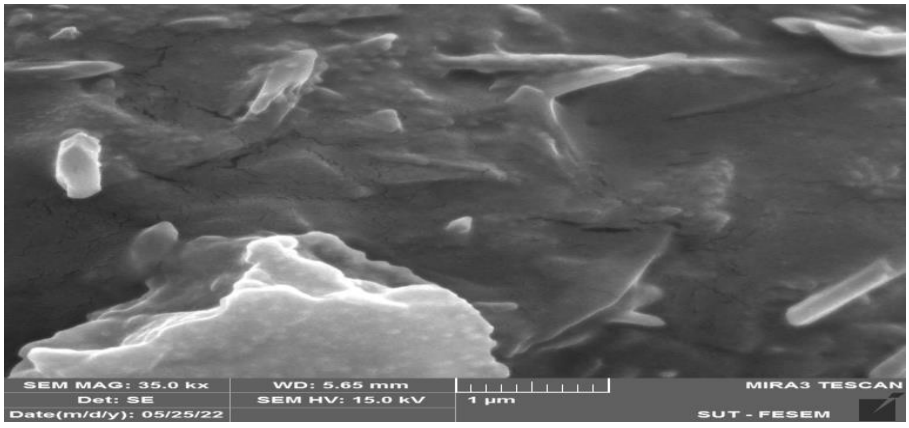
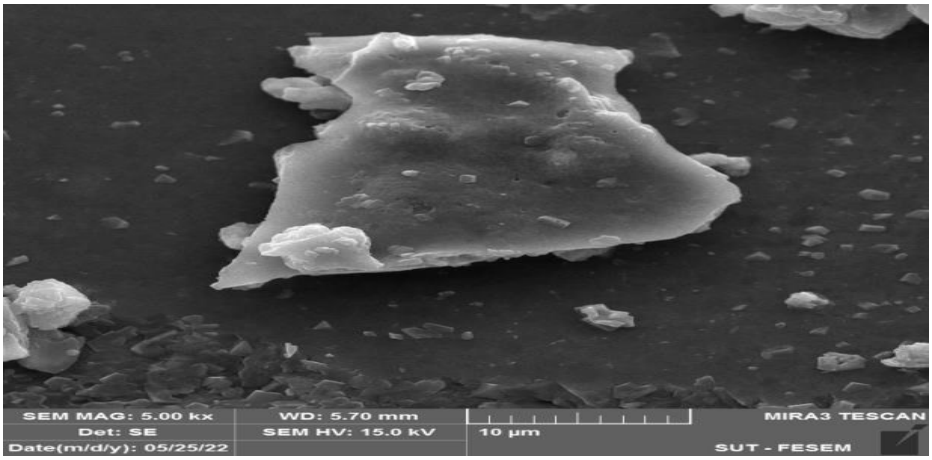


Figure (4) Diameter size of silver nanoparticles prepared from rue under a scanning electron microscope with a magnification of 1 micrometer.



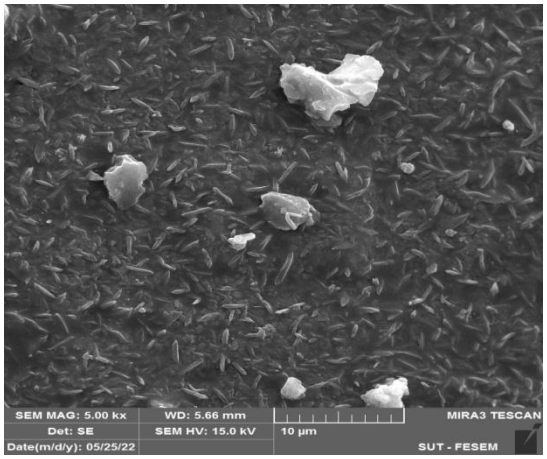


Figure (5) Silver nanoparticles prepared by mixing with rue extract under a scanning electron microscope at a magnification of 10 micrometers.

it shows an image of the sample surface in a three- and two-dimensional form, nano and micron.

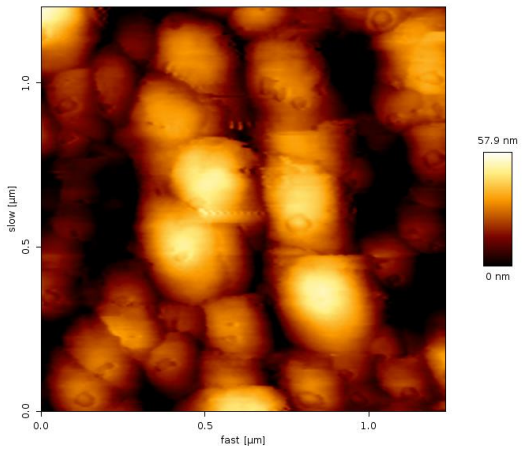
Atomic force microscopy measurement of silver nanoparticles prepared from rue leaves

height of the particles reached 57.9nm and had spherical shapes. For the diameter distribution of the prepared nanoparticles.

Atomic Force Microscope (AFM)

The atomic force microscope is an important measuring tool and has a superior analytical capacity. It is also considered one of the most famous microscopes for measuring, enlarging and moving with respect to the nanoscale level of the high capacity of this microscope, as

Examinations under the atomic force microscope showed that the silver nanoparticles prepared from the extract of the rue plant showed that the highest



.Figure 6: Two-dimensional (AFM) image of silver nanoparticles prepared from rue leaves

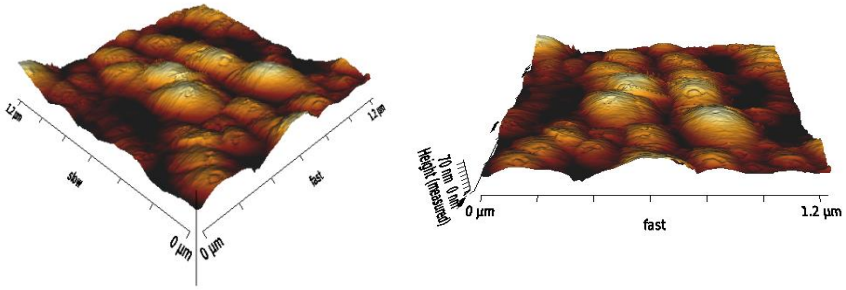
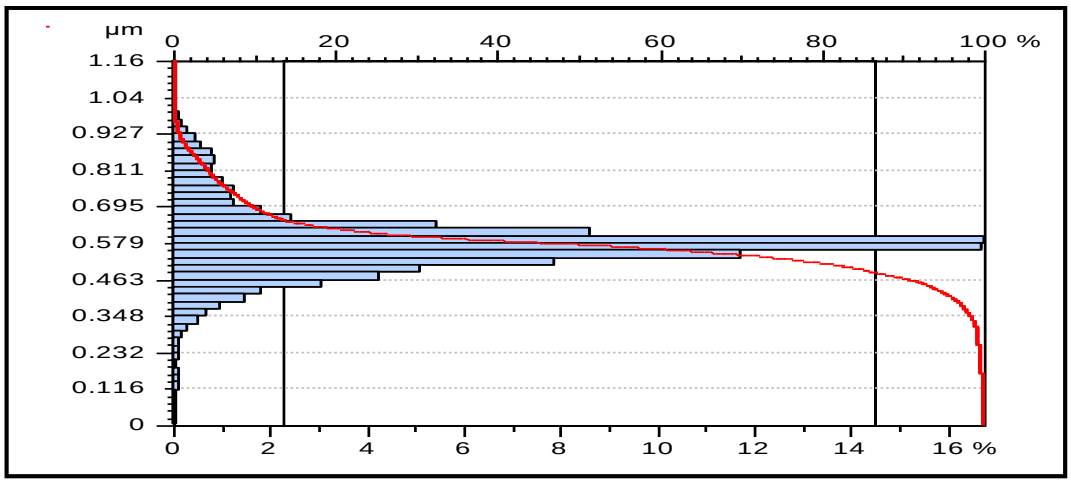


Figure (7): 3D AFM image of the prepared silver nanoparticles



Figure(8) Percentages of the average diameter distribution of nanoparticles

It is also noted from the results of the examination that there is a regularity in the distribution of these protrusions on the surface of the nano-activated carbon manufactured from rue leaves, and this can be seen in the two-dimensional image and the image of the data analysis, where areas and the direction of the presence of these particles appear within the examination sample, in addition to that they appear in dark areas containing a number It is larger than the protrusions compared to the light-colored areas, where these protrusions are less, thus forming the surface topography of this prepared sample.

Atomic force microscopy measurement of nanoscale activated carbon particles made from rue leaves.

Figures (9), (10) and (11) show a two- and three-dimensional atomic force microscopy image, in addition to a data analysis image of nanoscale activated carbon prepared using rue leaves.

Through the three-dimensional image of the prepared carbon, sharp bumps appear with a height of (39.73) nanometers as a maximum, and this in turn provides a large and good surface area that is suitable for applications that need a surface with a large surface area, such as adsorption and environmental sensitivity.

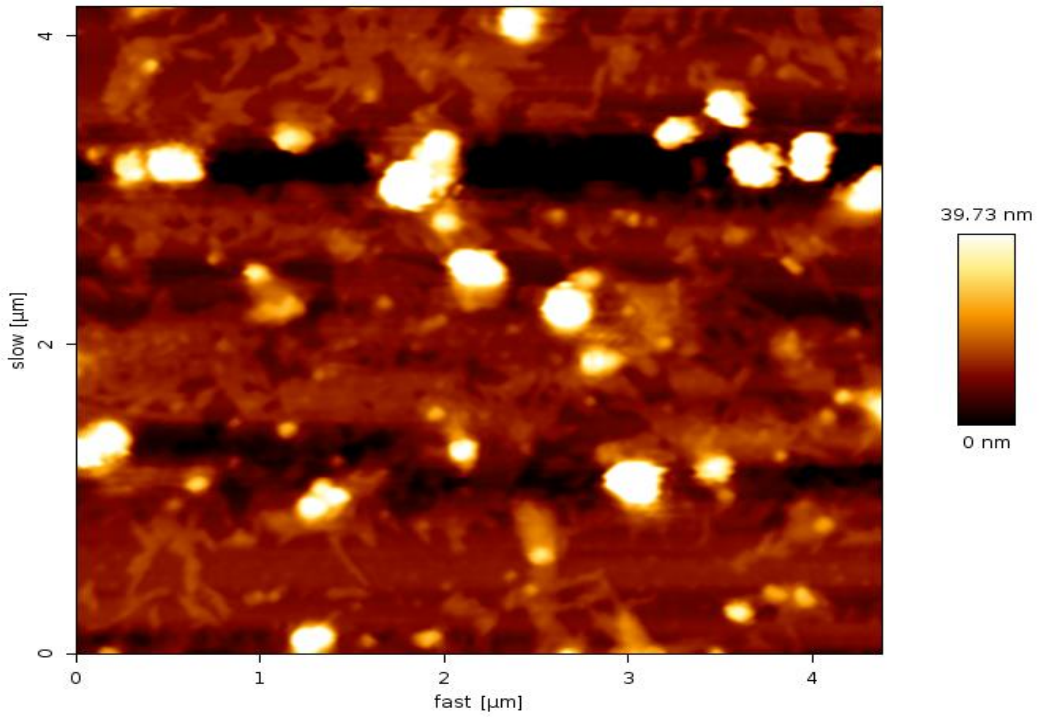
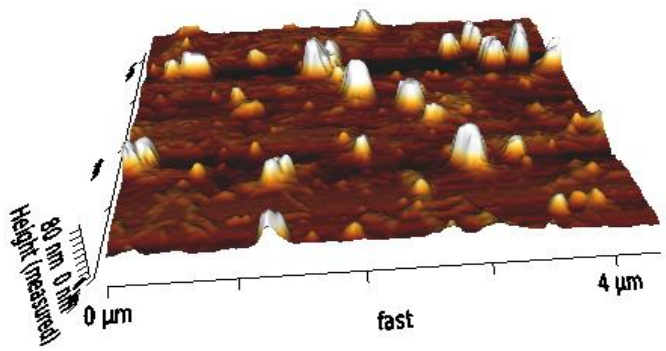


Figure (9): A two-dimensional (AFM) image of activated carbon nanoparticles



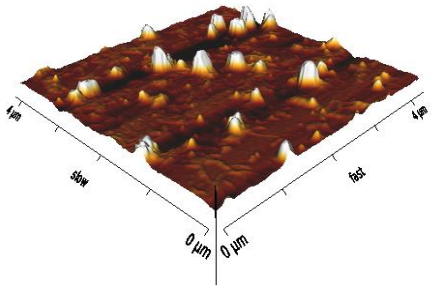


Figure (10) 3D AFM image of activated carbon nanoparticles

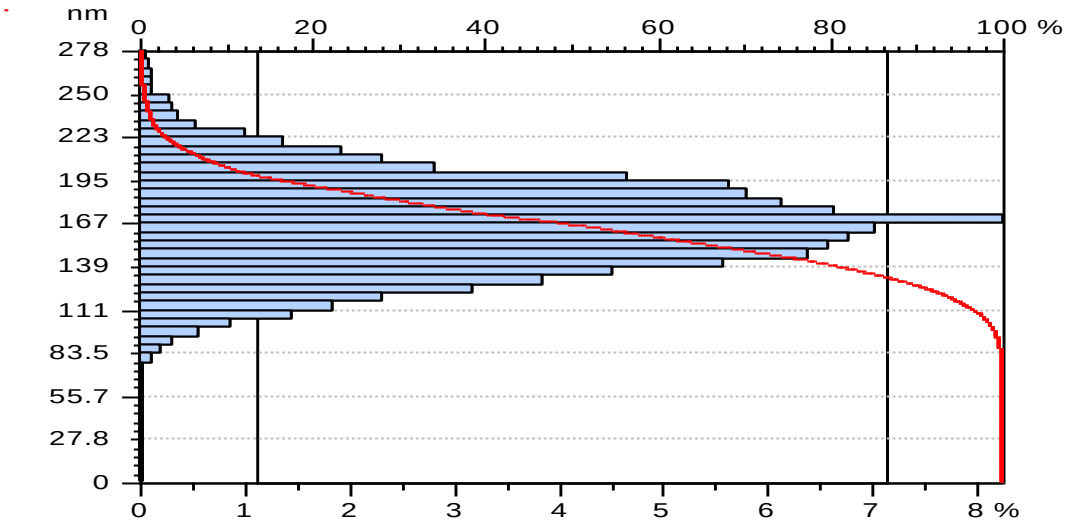


Figure (11): Percentages of nanoparticle sizes of activated carbon manufactured from rue leaves

Atomic force microscopy measurement of rue extract

Figures (12), (13) and (14) show a two- and three-dimensional atomic force microscope image, in addition to a data analysis image of an extract of rue leaves.

Through the three-dimensional image of the extract of rue leaves, small needle bumps appear, the height of which reaches (17.23) nanometers as a maximum, and it provides a large surface area and is well suited to applications that do not need a surface with a large surface area, such as adsorption and environmental sensitivity.

It is also noted from the results of the examination that there is a regularity in the distribution of these bumps on the surface of the extract of rue leaves, and this can be seen in the two-dimensional image and the image of the

compared to With the light-colored areas where these protuberances are less, thus forming the surface topography of this prepared sample.

data analysis, where areas and the direction of the presence of these particles appear within the examination sample, in addition to that they show dark areas that contain a greater number of bumps

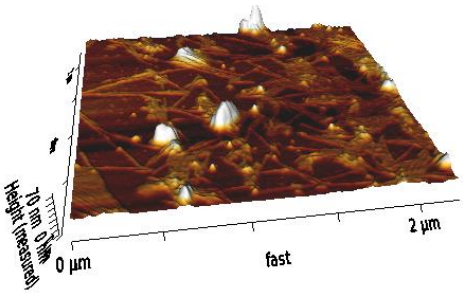


Figure (12) a two-dimensional (AFM) image of an extract of rue leaves

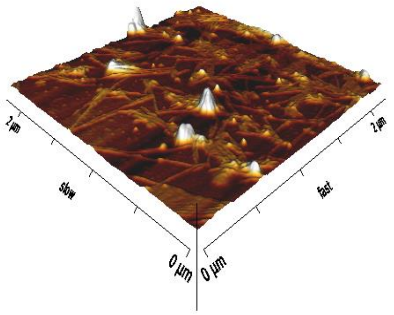


Figure (13) a three-dimensional (AFM) image of the topography of a rue leaf extract

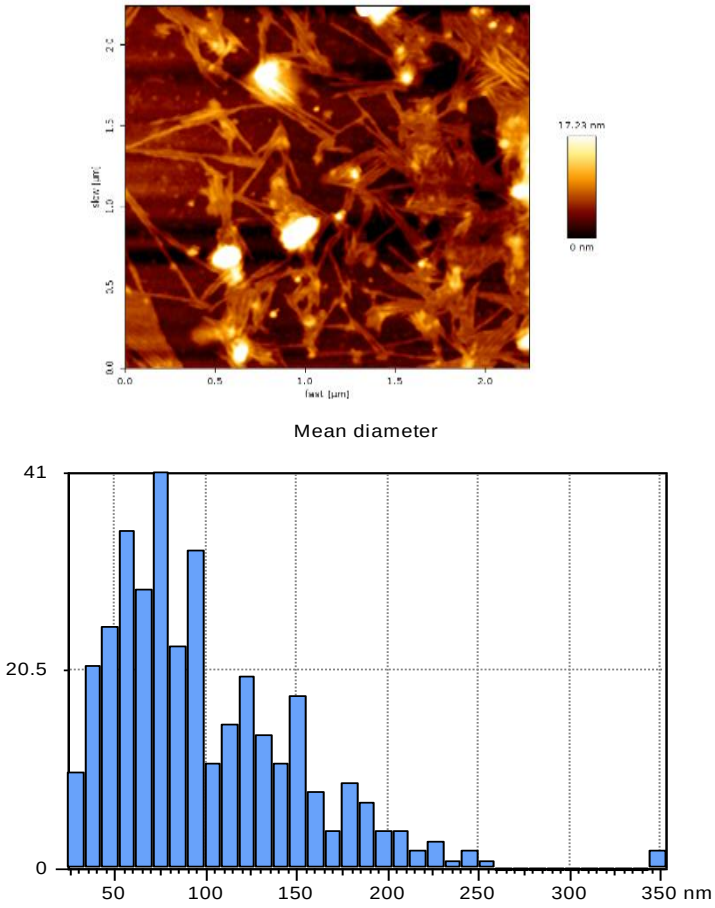


Figure (14): Percentages of particle sizes of rue leaf extract

device or the measurement process, as the bundles of gold at 20.00 kEV, silicon at 10.00 kEV, and aluminum at 15.00 kEV are attributed to the gold casing with which the sample is coated, in addition to the silicon-rich glass plate on which the sample is placed and coated. With aluminum, the bands of the other elements were attributed to the organic residues of activated carbon, while the band of oxygen at 0.530 kiloelectrons was spontaneous.

Energy-dispersive X-ray spectroscopy (EDX) of Nano activated charcoal

The X-ray energy dispersion measurement showed in Table (1) Figure (15) clear bands at 15.00 kEV attributed to the presence of carbon in the sample (nano activated carbon sample) which is caused by the charring of the organic matter in the sample, while the other bands were attributed to the presence of impurities When measured and its source, either the

Table (1): The proportions of the constituent elements of the nanoscale activated carbon sample

Elt	Line	Int	Error	K	Kr	W%	A%	ZAF	Formula	Ox%	Pk/Bg
C	Ka	11.5	5.6800	0.5548	0.1878	38.74	45.95	0.4849		0.00	76.44
O	Ka	8.8	1.3394	0.4304	0.1457	60.65	54.01	0.2402		0.00	72.05
S	Ka	0.0	0.0000	0.0000	0.0000	0.00	0.00	0.8304		0.00	2.02

Hg	Ma	0.3	0.7704	0.0148	0.0050	0.61	0.04	0.8206	0.00	2.03
				1.0000	0.3386	100.00	100.00		0.00	

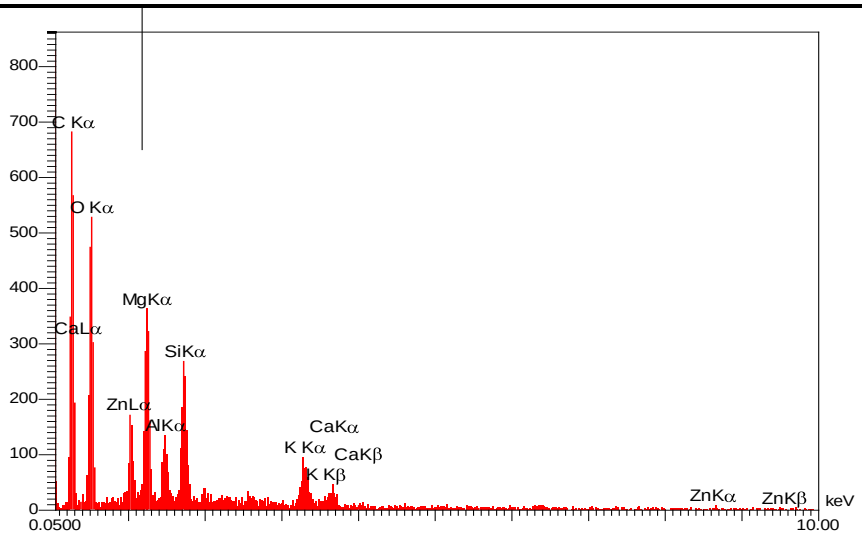


Figure 15: Energy dispersive X-ray (EDX) spectrum of nanoscale activated carbon

Energy-dispersive X-ray spectroscopy (EDX) of *Peganum Harmala*

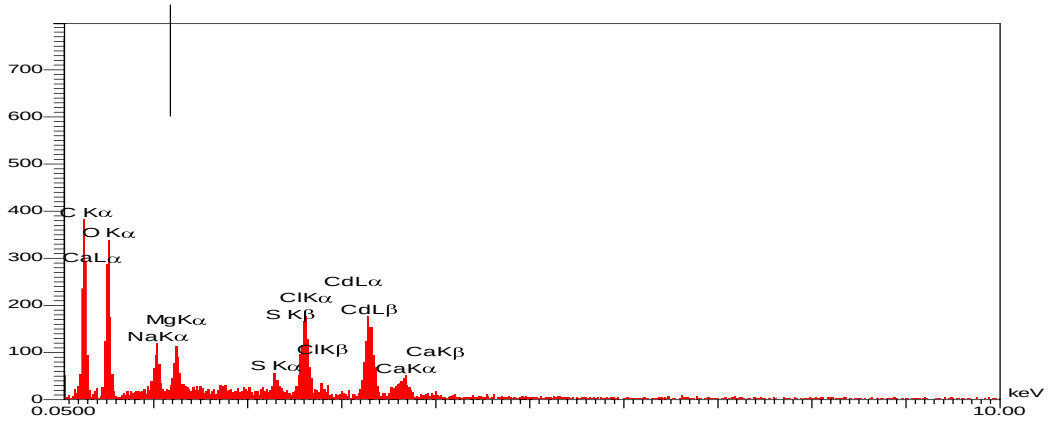


Figure 16: Energy dispersive X-ray (EDX) spectrum of the aqueous extract of rue

the gold envelope with which the sample is coated, in addition to the silicon-rich glass plate on which the sample is placed and also coated with aluminum. As for the band, it is attributed to organic residues. The other is from the plant extract, as well as other compounds that include these elements and some other elements. The oxygen band at 0.525 kiloelectrons was spontaneous.

The X-ray energy dispersion measurement showed in Table (2) Figure (16) clear bands at 10.00 kEV attributed to the presence of organic residues of the plant extract which is rich in chlorophyll, while the other bands were attributed to the presence of impurities when measured and their source is either the device or the measurement process The bands of gold at 20.00 kEV, silicon at 10.00 kEV, and aluminum at 15.00 kEV are attributed to

Table 2: Percentages of constituent elements of a sample of water extract of rue leaves

Elt	Line	Int	Error	K	Kr	W%	A%	ZAF	Formula	Ox%	Pk/Bg	Class	LConf	HConf	Cat#
C	Ka	422.2	286.7892	0.3531	0.1231	36.35	46.81	0.3386		0.00	1994.75	A	35.71	37.00	0.00
O	Ka	409.6	20.8456	0.3481	0.1214	50.76	49.08	0.2391		0.00	714.54	A	49.85	51.68	0.00
S	Ka	65.8	14.2039	0.0624	0.0217	2.64	1.27	0.8229		0.00	9.46	A	2.52	2.76	0.00
Fe	Ka	201.3	0.5578	0.2364	0.0824	10.24	2.84	0.8048		0.00	17.54	A	9.98	10.51	0.00
				1.0000	0.3486	100.00	100.00			0.00					0.00

studying the effect of peppermint oil, anise and SIVANTO in controlling Culex pipiens (Diptera: Culicidae) mosquitoes.

And when mixing the extract of the rue plant with silver nanoparticles at a concentration of (0.1%), we notice that the percentage of larval death increases by (86.67%) at a concentration of rue (12.5%) and (100%) at the rest of the concentrations, and this percentage increased when mixing food with a concentration of (0.5%) for the nano, to become (93.33%) for the sandalwood with a concentration of (12.5%) and (100%) for the rest of the concentrations. We notice a change in the color of the larvae from white to brown. The reason for this color change may be due to the effectiveness of the nanomaterial in penetrating the digestive canals of the larva And it reaches the body wall and oxidizes the wall, which leads to damage to the wall tissues and killing the larva.

Effect of rue extract, silver nanoparticles and activated charcoal nanoparticles on house fly larvae by feeding method.

The results show the effect of the rue plant extract on the larvae of the house fly by mixing it with food after six days of treatment, as the concentration of 50 percent of the rue plant extract caused the highest killing rate of (93.3%) larvae and the lowest killing rate (26.66%) at a concentration of 12.5%. The lethal effect of the extract of the rue plant may be due to the fact that rue leaves contain alkaloids and semi-alkaloids such as B-carbolines, Harmalol, Harmaline, Harmine, and Harman, which is the active substance in rue, which has pharmacological effectiveness against some diseases, which works As inhibitors of monoamine oxidation, these compounds have an inhibitory and insecticidal effect (Hanan and Marw ,2020) , This is consistent with the findings of (Yousef et al, 2022) while

entry of the extracts into the body of the larva.

The reason for this may be due to the ability of activated charcoal nanoparticles to carry extracts and chemical pesticides, as well as to carry silver nanoparticles, and its high adsorption capacity, and the presence of high pores on its surface that made it a carrier of these materials and their delivery to the target places in the body of the caterpillar. Table (3).

And when loading the rue extract and silver nanoparticles on activated charcoal nanoparticles at a weight of (0.1 g / liter), we notice that the movement and activity of the larvae decreases and stops after 6 hours of treatment, with the color of the larva changing to dark brown. However, when the weight of the activated charcoal nanoparticles was increased to (0.5g/L), the time required to kill the larvae was shorter, with the inability to move as a result of paralysis in the larva due to the

Average	nano +carbon 0.05	nano + carbon 0.01	nano 0.05	nano 0.01	Extract	concentrations	Transactions
78.66	93.33	93.33	93.33	86.66	26.66	12.5%	
91.33	100	100	100	100	56.66	25%	
98.66	100	100	100	100	93.33	50%	

Table (3) Effect of rue plant extract mixed with silver nanoparticles and loaded on activated charcoal nanoparticles by feeding method.

The lethal effect of the extract of the rue plant may be due to the fact that rue leaves contain alkaloids and semi-alkaloids such as B-carbolines, Harmalol, Harmaline, Harmine, and Harman, which are the active substances in rue, which have pharmacological effectiveness against some diseases, which act as mono-oxidation inhibitors. The amine and these compounds have an inhibitory and insecticidal effect (Hanan & Marwa, 2020). And when mixing the extract of the rue plant with silver nanoparticles at a concentration of (0.1%), we notice that the percentage of larval death increases by (93.33%) at a concentration of rue (12.5%)

Effect of rue extract, silver nanoparticles and activated charcoal nanoparticles on house fly larvae by immersion method.

The results show the effect of the rue plant extract on the larvae of the house fly by immersing the larvae in it after six days of treatment, as the concentration of 50 percent of the rue plant extract caused the highest rate of killing the larvae amounted to (83.33%), while the lowest rate of killing the larvae at the concentration was (12.5). %) of the extract of the leaves of the rue plant, which amounted to (23.33%).

this is evidence of the penetration of particles Silver and charcoal nanoparticles of the body wall of the insect, and the reason for this color change may be due to the effectiveness of the nanomaterials in penetrating the body wall and the occurrence of oxidation of the wall, which leads to damage to the wall tissues and killing the larva.

The reason for this may be due to the ability of activated charcoal nanoparticles to carry extracts and chemical pesticides, as well as to carry silver nanoparticles due to its high adsorption capacity and the presence of high pores on its surface that made it a carrier of these materials and deliver them to the target places in the body of the caterpillar.

and (100%) at the rest of the concentrations, and when the concentration of silver nanoparticles is increased to (0.5%) It is noticed that the time period for killing the larvae is faster, with a change in the color of the larvae from white to brown. The reason for this color change may be due to the effectiveness of the nanomaterial in penetrating the wall of the larvae's body and crossing it into the larvae's body, which leads to paralysis in its movement and killing it in A short time that does not exceed 6 hours after the treatment, it is noted that when loading the extract of rue plant and silver nanoparticles on activated charcoal nanoparticles at a weight of (0.1 g / liter) Table (4), the color of the larva changes to dark brown to blackish, and

Table (4) Effect of rue plant extract mixed with silver nanoparticles and loaded on activated charcoal nanoparticles by immersion method.

average	nano +carbon 0.05	nano + carbon 0.01	nano 0.05	nano 0.01	Extract	concentrations	Transactions
79.66	96.66	90	96.66	93.33	23.33	12.5%	
89.99	100	100	100	96.66	53.33	25%	
96.66	100	100	100	100	83.33	50%	

3- The ability of rue plant extract to kill house fly larvae.

4- The ability of activated charcoal nanoparticles to carry rue extract and silver nanoparticles.

Conclusions.

1- The possibility of manufacturing silver nanoparticles from plant extracts.

2- The possibility of manufacturing nanoscale activated charcoal from cheap and available materials.

References:

the growth, survival and reproduction of the house fly (Musca domestica L. (Diptera: Muscidae), Master Thesis,

1. **Abdel Fattah, Nihad Mostafa (1989).** The effect of mutual constant temperatures and relative humidity on

using them in treating polluted industrial water , Cite as: AIP Conference Proceedings 2394, 040053 , https://doi.org/10.1063/5.0122779 Published Online: 08 November 2022 .

9. **AL-Zubaidi, F . S. ; AL –Rubeai , H. M. and AL- Okaily , L . (1998).** Solvent extract of *Callistemon rugolosus* Miq . Effects growth , development and survival of house fly *Musca domestica* L (Diptera : Muscidae). Babylon Univ. J. 6 (3) : 937 - 943 .
10. **Badi, S., Hamed, A., Abualama, M., Mustafa, M., Abdulraheem, M., & Yousef, B. (2021).** Knowledge, attitude, and practice of sudanese pharmacists toward COVID-19 in Khartoum State, Sudan: An online-based cross-sectional study. Libyan International Medical University Journal, 6(01), 19-26.
11. **Bergstrom, J. (2015).** Mechanics of solid polymers: theory and computational modeling. William Andrew.
12. **Feeny** , P .P . (1969) . Inhibitory effect of oak leaf tannins on the hydrolysis of proteins by trypsine . phytochemistry , 8 : 2119 – 2126 .
13. **Govindarajan, S., Mustafa, M. A., Kiyosov, S., Duong, N. D., Raju, M. N., & Gola, K. K. (2023).** An optimization based feature extraction and machine learning techniques for named entity identification. Optik, 272, 170348.
14. **Hanan A. Shaheen &Marwa Y. Issa,(2020).** In vitro and in vivo activity of Peganum harmala L. alkaloids against phytopathogenic bacteria , Scientia Horticulturae ,. 3.46 .

College of Science - University of Baghdad, Iraq.

2. **Abdulazeez, M. I., Hamdi, A. Q., Mohammed, H. Y., & Ahmed, M. (2020).** Dental trauma of permanent incisor teeth in children/Kirkuk city. studies, 22, 23.
3. **Ahmed Taha Yaseen , Liqa'a Hussein Alwan(2020).** Thermodynamic Study of Adsorption of Tamoxifen Drug on Activated Nano-Coal Particles prepared from Stem of Eucalyptus and its Diagnosis by different Techniques. IJDDT.; Vol(10) Issue 3.P.P.239-241.
4. **Alaa M. Abdullah, Liqaa H. Alwan, Abdulqader M. Abdulqader(2020).** Thermodynamic and kinetic studies of Eriochrome black adsorption on activated charcoal prepared from lemon leaves. This content was downloaded from IP address. 128.123.44.24 on 16/01/2020 at 10:48.
5. Ali, A. H., Ahmed, H. S., Jawad, A. S., & Mustafa, M. A. (2021). Endorphin: function and mechanism of action. Sci Arch, 2, 9-13.
6. **Ali, S. H., Armeet, H. S., Mustafa, M. A., & Ahmed, M. T. (2022, November).** Complete blood count for COVID-19 patients based on age and gender. In AIP Conference Proceedings (Vol. 2394, No. 1, p. 020044). AIP Publishing LLC.
7. **Al-Tikriti, Ahmed Ali Issa (2001).** Toxic effect of extracts of Melia azedarach L. and Cyperus rotundus L. on the survival of the southern cowpea beetle Callsobruchus maculatus F., Master Thesis, College of Education - University of Tikrit, Iraq.
8. **Alwan , liqaa Hussein (2022) .** The synthesis of carbon nanoparticles (CNPS) by eco-friendly method and

15. **Harborne,J. (1973).**"Phyto chemical methods".Halsted Press.John Wiely and sons ,New York.Folch J, Lees M, Stanley GHS (1957)" A simple method for the isolation and purification of total lipids from animal tissues ". J. Biol. Chem. 266:497–509.
16. **Hazfez , M .(1949).** A simple method for breeding the house fly *Musca domestica* (Diptera : Muscidae) . in the laboratory . Bull . Entomol . Res . 39 :385- 386 .
17. **Hussein, S.,and John L.(2014).** Housefly, *Musca domestica* Linnaeus (Insecta: Diptera: Muscidae). Inst. Food Agric. Scie.,47:1–7.
18. **Ider, M., Abderrafi, K., Eddahbi, A., Ouaskit, S. , and Kassiba, A. (2017).**Silver metallic nanoparticles with surface plasmon resonance: Synthesis and characterizations, Journal of Cluster Science. 28- 1051–1069.
19. **Jebril, S. , Khanfir Ben Jenana R. , Dridi , C.(2020)**. Green synthesis of silver nanoparticles using *Melia azedarach* leaf extract and their antifungal activities: in vitro and in vivo. Journal Pre-Proof S0254-0584(20)30276-5.
20. **Kadham, S. M., Mustafa, M. A., Abbass, N. K., & Karupusamy, S. (2022).** IoT and artificial intelligence–based fuzzy-integral N-transform for sustainable groundwater management. Applied Geomatics, 1-8.
21. **Karupusamy, S., Mustafa, M. A., Jos, B. M., Dahiya, P., Bhardwaj, R., Kanani, P., & Kumar, A. (2023).** Torque control-based induction motor speed control using Anticipating Power Impulse Technique. The International Journal of Advanced Manufacturing Technology, 1-9.
22. **Khot, L., Sankaran, S., Maja, M., Ehsani, R. and Schuster, E. (2012).** Applications of nanomaterials in agricultural production and crop protection: A review. Crop Prot., 35: 64-70.
23. **Mahdi, E. M., & Mustafa, M. A. (2022).** Effect of different concentrations of extract of Urtica dioica and Cladosporium cladosporiodes on Tribolium castaneum or: Coleoptera after 24-48 hours of exposure in Samarra City/Iraq. HIV Nursing, 22(2), 3207-3210.
24. **Mustafa, M. A., Kadham, S. M., Abbass, N. K., Karupusamy, S., Jasim, H. Y., Alreda, B. A., ... & Ahmed, M. T. (2023).** A novel fuzzy M-transform technique for sustainable ground water level prediction. Applied Geomatics, 1-7.
25. **Nazni, W. A.; Seleena, B.; Lee, H. L.; Jeffery, J.; Rogayah, T. A. R. and Sofian, M. A. (2005).** Bacteria fauna from the house flies (Musca domestica) L., Trop. Biomed., 22(2): 225-231.
26. **Noor S. Abd AL-hadia , and Liqaa H. Alwaan(2020).**Preparation of Activated nano Charcoal from Pomegranate Peel and use it to Adsorption Drug Methylene Blue from Aqueous Solution . AIP Conference Proceedings.; 2213, 020307; https://doi.org/10.1063/5.0000466.
27. **Nylon, G.; Dunstan, F. ; Palmer, S.; Ersson, Y.; Bager, F.; Cowden, J.; Rel, G.; Galloway,Y.; Kapper,G.; Megaud, F.; Mol back,K.; Peterson, R. and Runntu, P.(2002),** The seasonal distribution of campylobacter infection in nine European countries

040020 (2022); https://doi.org/10.1063/5.0121600

35. **Yeo, S. , Lee, H. and Jeong, S. (2003).** Preparation of nanocomposite fibers for permanent antibacterial effect. J. Mater. Sci. 38: 2143 – 2147.
36. **Yousef, Shahad Hamed ; Mustafa, Harith Ahmed and alwan, liqaa hussein (2022).** Effect of peppermint and anise oil and esticide SIVANTO in the control of *Culex pipiens* (Diptera:Culicidae) mosquitoes , Journal homepage**: www.sciencearchives.org** , *Science Archives* (2022) Vol. 3 (3), 220-223 .
37. **Youssef, Shahd Hamid (2022).** The effectiveness of silver nanoparticles prepared biologically from the fungus Verticillium lecanii, some vegetable oils and the chemical pesticide SIVANTO in the control of mosquitoes Culex pipiens (Diptera: Culicidae), master thesis, Faculty of Education, Samarra University, Department of Life Sciences.
38. **Zhou, W., Apkarian, R., Wang Z. and Joy D. (2006).** Fundamentals of scanning electron microscopy (SEM). Scanning microscopy for nanotechnology. Springer, New York, NY, 1-40.

and New Zealand, Epidemiol. Infect.,128(3): 383-390.

28. **Ommi, D., Hashemian, S., Tajbakhsh, E., and Khamesipour F.(2015).** Molecular detection and antimicrobial resistance of Aeromonas from houseflies (*Musca domestica*) in Iran. Revista MVZ Córdoba .,20(Suppl):4929–36
29. **Sinthusiri, J. and Soonwera, M. (2010).** Effect of herbal essential oils against larvae, pupae and adults of house fly (*Musca domestica*: Diptera). Proceedings of 16th Asian Agricultural Symposium and 1st Int. Symposium on Agricultural Technology, Bangkok, Thailand, pp: 639 - 642.
30. **Sudha, I., Mustafa, M. A., Suguna, R., Karupusamy, S., Ammisetty, V., Shavkatovich, S. N., ... & Kanani, P. (2023).** Pulse jamming attack detection using swarm intelligence in wireless sensor networks. Optik, 272, 170251.
31. **Tiwari .A, and Bind .A, (2014)** "Effective removal of pesticide (Dichlorvos) by adsorption onto super paramagnetic poly (styrene-co-acrylic acid) hydrogel from water" ; Int. Res. J. Environment Sci. 3, PP.1-46.
32. **West , L. S. (1951)**. The house fly , its Natural History . Medical important , and Control .Comstock Publ Co . Ithaca , New York 584 pp.
33. **Wright, J. (1971).** The WHO programme for the evaluation and testing of new insecticides. Bull. World Health Organ. 44: 9 - 22.
34. **Yassen , ahmed taha and alwan , liqaa , liqaa Husuein (2022).** A Spectroscopic Study to Adsorb a Mixture of Tamoxifen and Nanoparticle Zinc Oxide on the Surface of Activated Charcoal , Cite as: AIP Conference Proceedings 2394,