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Research Article

GREEN SYNTHESIS OF MAGNESIUM OXIDE AS NANOPARTICLE SYNTHESIS FROM PLANT EXTRACT AND ITS BIOLOGICAL ACTIVITY

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A B S T R A C T

In the present investigation, nanomaterialswas prepared with MgO and Medicinally important plant Aloe Vera with a simple inexpensive techniques for synthesis of nanostructures with potential applications. Phytochemical Analysis was performed. It revealed the presence of phyto-chemical constituents such as, carbohydrate, tannis, flavanoids, glycosides, phenol, alkaloid, protein. Determination of antimicrobial activity was performed with synthesized nanoparticle, with better activity showing 4.6mm Zone of inhibition for the pathogen Staphylococcus aureus. Determination of antifungal activity was performed with Nanoparticle against fungal pathogen Aspergillus niger and Aspergillus flavus. Evaluation of nanoparticle synthesized was performed to check its efficacy for its pharmacological effect to be used as Anti-inflammation, Anti-pyretic study using animal model. Evaluation of toxicity study of synthesized nanoparticles by haemolysis. The study was carried out to extract aloeveraby pulverization, purified (soxhlet apparatus). The Magnesium tetrahydrate, was used for preparation of nanoparticles, since it has high surface area, with mild reactions. MgO nanoparticles was prepared by green synthesis. Biosynthesized nanoparticles were detected by colour change from green to honey brown. The green synthesized nanoparticles were characterized by X-ray Diffraction studies. Calcined fixed temperature, and no other impurities are found in synthesis. In order to evaluate, the general view of morphology of calcined nanoparticles. Scanning Electron microscopic Studies, with SEM images have been observed. It showed that green synthesized nanoparticles are agglomerated in nature with a spherical in shape with diameter of Nanoparticle is 140 nm.

INTRODUCTION

The field of nanotechnology is one of the most active areasofresearch in modern material sciences. Nanotechnology is a field that is developing day by day, making an impact in all spheres of human life and creating a growing sense of excitement in the life sciences especially biomedical devices and biotechnology. (Prabhu, *et al*., 2010). In nanotechnology world , nanoparticles plays major role in many application because nanoparticles have superior properties than bulk materials like electrical conductivity, mechanical strength, magnetic properties, thermal ability etc. Nanoparticles has large number of application in many areas (Nalwa, 2007). Nanoscience is a new inter disciplinary subject that depends on the fundamental properties of nanosize objects (Abou, Elnour., and Rana, *et al*.,2010). Nanoparticles possess wondrous optical, electronic, magnetic, and catalytic properties than the bulk material owing to their high surface area to volume ratio (Poulose, *et al*., 2014).

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Metal nanoparticles like silver and gold show different colors due to their surface Plasmon resonance(SPR) phenomenon. Silver nanoparticles have received attention due to their physical, chemical, and biological properties that attributed to the catalytic activity and bactericidal effects and found applications in nano biotechnological research (Sharma, *et al*., 2009 and Fayez, *et al*.,2010). The synthesis of silver nanomaterial or nanoparticles extensively studied, by using chemical and physical methods. But the development of reliable technology to produce nanoparticles is an important aspect of nanotechnology. Biological synthesis process provides a wide range of environmentally acceptable methodology, low cost production and minimum time required. At the same time the biologically synthesized silver nanoparticles has many applications includes catalysts in chemical reactions. Microbial source to produce the silver nanoparticles shows the great interest towards the precipitation of nanoparticles due to its metabolic activity. (Kumar, *et al*.,2003). Nepheliumlappaceum, L. Peels was effectively used for the synthesis of magnesium oxide nanoparticles as a natural ligation agent. The XRD and SEM revealed the crystalline and spherical morphology of the

biosynthesized nanoparticles. The size of the particles was found to be 60- 70 nm as deduced from XRD and SEM analysis. The particle size of as synthesized magnesium oxide powders measured by PSA was approximately 100 nm. The successful formationof magnesium oxide nanoparticles was confirmed employing XRD, SEM-EDX and PSA analysis. Magnesium oxide is a semiconductor/insulator which crystallizes in rock salt / sodium chloride (Nacl) type cubic structure Like Mgomany binary oxides for instance Cao, Sro, Bao, Nio and CoO,also crystallize in rock salt structure. Mgo is an attractive material which has many potential applications such as water purification, optoelectronics, microelectronics, and additive in heavy fuel oil, paint, gas separation, bactericides, and insulator in industrial cables, crucibles, and refractory materials. (Spoto, *et al*.,2004). Magnesium Oxide nanoparticles have attracted the attention of several researchers (Facile synthesis of MgOnanoparticles. Gold nanoparticles supported on MgO nanoparticles have been used for degradation of insensitive unit ion compound Diaminodinitroethylene, cytotoxicity, permeability and inflammation of Mgo nanoparticles in human cardiac micro vascular endothelial cells have been studied by(Sun, *et al*., 2010 and Wang, *et al*., 2009). Aloe vera is a hardy, perennial, tropical, drought- resistant, succulent plant belonging to the liliaceae family which, historically has been used for a variety of medicinal purposes. It has a vast traditional role in indigenous system of medicinelike ayurveda, siddha, unani and homeopathy. Clinical evaluations have revealed that the pharmacological active ingredients are concentrated in both the gel and rind of the aloe vera leaves. The plants can be harvested afterevery 6 to 8 weeksby removing 3-4leaves per plant. It produces rectumbranchedflowering stalks in the second year in winter season, which grows 90-150 cm tall. (Bunyapraphatsara, *et al*.,1996).

Hence in the present investigation, much focus of attention were giventogreen synthesis of nanoparticles from aloe vera plant extract and evaluation of MgO nanoparticle against antimicrobial activity, antifungal activity, anti-inflammatory activity and, anti-pyretic activity, hemolytic activity was studied. To determine aloe vera as the green synthesis with magnesium oxide nanoparticles and to predict nano size by XRD and shape based SEM analysis. In addition to evaluate pharmacological effect using animal model, was also studied.

MATERIAL AND METHODS

Sample Collection

Magnesium acetate tetra hydrate used for the synthesis of magnesium nanoparticles was procured from modern scientific company Madurai. Aloe Vera used in this work was collected from the herbal garden. Indian medicinal plant aloe Vera was selected on the basis of cost effectiveness. Ease of availability and medicinal property. Fresh and healthy leaves were collected locally and rinsed thoroughly first with distilled water, to remove all the dust and unwanted visible particles, cut into small pieces and dried at room temperature . About 50 g of leaves weighed separately and transferred into beakers and 100ml distilled water dissolved in filtered by filter by filter paper and get to clear solutions was extract collected.

Extraction of Aloe Vera By Soxhlet Apparatus

The chemical extraction was done by following the method of Sreenivasa Rao and Parekh (1981). 2g of aloe vera leaf was extract in soxhlet apparatus using chloroform (100ml) as solvent for 8 hours at 65^0c. Soxhalation is a process of continuous extraction in which the same solvent can be circulated through the extracted several times. The process involves extraction followed by evaporation of the solvent. The vapors of the solvent were taken in a condenser and the condensed liquid will be returned to the same for continuous extraction. Soxhlet consists of a body of extractor attached with a side and siphon tube. The extractor from the lower side can be attached to distillation flask and the mouth of extractor is fixed to a condenser by standard joints. The aloe veraleaf extract as thimble is placed in the soxhlet apparatus. The diameter of thimble corresponds to the internal diameter of the soxhlet extractor, few porcelain pieces are added into the flask to avoid bumping of the solvent. The vapour of solvent pass through the side tube and condensed as liquid gradually increasing the levels of liquid in the extractor and siphon tube.A siphon is setup as the liquid reaches the point of return and the content of the extractor chamber are transferred to the flask. The cycle of solvent evaporation and siphoning back can be continued many times without changing solvent to get efficient extraction. The resulting extracts were concentrated to dryness in a rotary evaporator under reduced pressure and were stored at 4^0c.

Magnesium Nanoparticles Synthesis

For the synthesis of magnesium oxide nanoparticles, 1 molarity of magnesium acetate tetra hydrate and leaf extract were taken in conical flask. It was kept in shaker for through mixing for 2 hour. After a short gap of 10 minutes, the 1% of NAOH solution as added to the solution. It was mixed well and kept in hot air oven for 2days at 130^oC, after drying the dried particles werecollected and thesample was packed for analysis.

Phytochemical Analysis

Preliminary phytochemical analysis of Aloe vera leaf extract and Nanoparticle synthesis compound. The sequentially extracted nanoparticles were used for the qualitative analysis for the identification of plant phytoconstituents.

X-Ray Diffraction Analysis

In order to study the Nano particle of the synthesized compound and its optical properties x-ray diffraction study was carried out. X-ray powder diffraction (XRD) is a rapid analytical technique primarily used for phase identification of a crystalline material and can provide information on unit cell dimensions. The analyzed material is finely ground, homogenized, and average bulk composition is determined.X-ray diffraction is based on constructive interference of monochromatic X-rays and a crystalline sample. These x-rays are generated by a cathode ray tube, filtered to produce monochromatic radiation, collimated to concentrate, and directed toward the sample. The interaction of the incident rays with the sample produces constructive interference. When conditions satisfy Bragg`a law ($n\lambda = 2d \sin \theta$). This law relates the wavelength of electromagnetic radiation to the diffraction angle and the lattice spacing in a crystalline sample.

Scanning Electron Microscopic Analysis

In order to elucidate the size and shape of structural components of synthesized nanoparticle from aloe Vera. The samples were analyzed for nanometer resolution for measuring nanoparticle size.

Antimicrobial And Antifungal Activity of Nanoparticle Compounds Treated Against Bacterial And Fungal Pathogens Using Well Diffusion Method

Antimicrobial and antifungal activity of the extract of compounds was determined using well diffusion method. It was performed by sterilizing Mueller Hinton agar media. After solidification, wells were cut on the Mueller Hinton agar using cork borer. The test bacterial pathogens were swabbed onto the surface of Mueller Hinton agar plates. Wells were impregnated with 25 µl of the test samples. The plates were incubated for 30 min to allow the extract to diffuse into the medium. The plates were incubated at 30^{o}C for 24 hours, and then the diameters of the zone of inhibition were measured in millimeters. Each antibacterial assay was performed in triplicate and mean values were reported.Antifungal activity of the extract of compounds was determined using well diffusion method. Each antimicrobial and antifungal assay was performed in triplicate and mean values were reported

Hemolytic Activity For Nanoparticles Compound

Hemolytic activity was performed in 5% sheep blood agar plates (Mulligan, 2009 and Cooper, 1989). 50 µl of nanoparticle extract was spot inoculated on to blood agar plates and incubated for 24 hours at 37°C. After incubation, no zone around the nano particle extract was noted.

Evaluation of Pharmacologic Studies Using Nanoparticlesanti Inflammatory Studyexperimental Design

Albino mice of either sex weighing between 130-170 g were procured from animal house Venture Institute of Biotechnology and Bio informatics Research, Madurai (subjective approval of ethical committee) Used for the present study. They were maintained under standard conditions ($24\text{-}28^{0}$). And fed a standard diet for mice and given water.

Formalin-Induced Mice Paw Oedema

Albino rats of both sexes weighing 150- 200g were divided into 3 groups overnight fasted adult rats were randomized into 3 groups and treated as follows, first group was given saline orally 5 ml /kg (control), second group was injected paracetomol 10mg/kg subcutaneously and the next groups were given 100mg/kg concentration of nanoparticles extract orally. After 30 mins. Formalin 0.1 ml of 1% formaldehyde was injected in the planter region of the right paw of the all the rats. The right paw (non-inflamed) served as a reference for comparison. The circumference of all rats was measured at 1,2, and 3 hours after changes. The volume was measured before and after 3 hours of formalin treatment (Kulkarni, 2008).

Percentage of anti-inflammatory activity = $V_C - V_t/v_c \times 100$

V_c – control, Vt- test sample, Vt- Mean paw volume in the drug treated group

Vc- Mean paw volume in control group.

Antipyretic Effect of Nanoparticle Compounds Using Pyrexia Method

Treatment was carried out as, **Group1:**Control (normal saline 5ml/kg), **Group 2:** Paracetamol (10mg/kg) and **Group3:**100 mg/kg nanoparticles extract.

A suspension of Brewer`s yeast (15%) in saline (0.9%) was prepared. Four groups each containing 3 mice of either three were taken .The thermocouple was inserted 2cm deep into the rectum and the rectal temperatures were recorded. The animals were fevered by injection brewer`s yeast suspension (10 mg /kg) subcutaneously in the back the nape of the neck. The injection site was massaged in order to spread the suspension beneath the skin. The room temperature was kept at $22\text{-}24^{0}$c. Immediately after yeast administration food was withdrawn and the rise in rectal temperature was recorded.The measurement was repeated after 30 minutes. The dose of the test compound and standard drug was given orally, the rectal temperature was recorded again 1, 2, and 3 hours, paracetamol (10 mg/kg) was selected as standard drug.

RESULT

In the present study the aloe vera plants were collected and extract using soxhlet apparatus. (Plate:1, 2 and 3). In the present investigation synthesis of MgO and Aloe vera (plant extract). MgO nanoparticles was carried out. The biosynthesis of nanoparticles initially detected by colour as green and challenged to honey brown. The results were showed in Plate: 4. The aloe vera extract were performed in phytochemical analysis. The phytochemical analysis of aloe vera extract and nanoparticles synthesized compound extract was studied. The results revealed presence of carbohydrate, tannis, flavanoids, glycosides, phenols. It is justified that phenolic compounds present in aloe vera inhibit glucose transports there by inhibit sodium glucose co-transporter. Our finding was supported by (Hakim, *et al*., 2007). The results were depict in Table: 1 and Plate:5. The nanoparticle synthesized compound end product were showed in Plate: 6.

XRD diffraction patterns of MgO nanoparticles calcined at fixed temperature for different duration was recorded and presented in Fig-1 .The observed diffraction peaks of MgO at $200=41.9^{0}$, No subsequent peaks of Mg $(OH)_2$, Mg or other impurities are detected in XRD pattern .The Average crystallite size of the prepared nanopowder is found to be around 35nm calculated using scherer`s equation and which is the order of nanosize. The diffraction peaks of MgO which was shown in Fig-1 and coincides in (JCPDS File no-77-2364)(Figure: 1). The above results were in total confirmation with the findings of Lakshmi, *et al*., 2012. Where in she emphasized the XRD pattern of aloevera using MgO. Subsequently, Jeevalakshmi, *et al*., 2012 studied antimicrobial activity of nanoparticle synthesized by cold and hot methods. The scanning electron microscope, of MgO nanoparticles produced by aloe vera green synthesis method is shown in Fig-2. The SEM analysis was used to determine the structure of reaction products that were formed. SEM image have showed individual nanoparticles as well as number of quantity. The Figure- 2 show the particles are magnified X20,000 and X30,000.

Anti-Microbial Activity and Synergistic Effect of Nanoparticle Synthesized Compound

In order to check the efficacy of synthesized nanoparticles against selected pathogens such as *E.coli, Pseudomonas fluroscence, Staphylococcusaureus*, and *Shigella flexneri* was studied. Evaluation of antimicrobial activity revealed Magnesium oxide nanoparticles exhibit against standard (Streptomycin) showed a zone of inhibition at 4.1mm whereas, nanoparticle synthesized extracts with antibiotic exhibited a synergistic effect with zone of inhibition mounted to 4.6mm in diameter against *Staphylococcus aureus*, which is followed by *Shigellaflexneri* exhibited a synergistic effect of 4.2mm in zone of inhibition. Similarly antimicrobial activity was studied by Sharath, *et al*., 2008 in magnesium oxide nanoparticles against *E.coli* and *Stapahylococcusaureus*i ndicated a similar result. This study of aloe vera or green synthesis of nanoparticles showed significant activity compared to standard streptomycin. Study further showed a synergistic activity was tremendous by analyzing the zone of inhibition (Plate:7 and Figure: 3).

Anti –Fungal Activity and Synergistic Effect Of Nanoparticle Synthesized Compound

Similarly, the study was further extended to evaluate anti-fungal properties of green synthesized MgOnanoparticles from aloe vera extract against two fungus *Aspergillus flavus and Aspergillus niger*. The results revealed prominent zone of inhibition was observed nanoparticles of MgO extract with 17mm against *Aspergillus flavus* and 20mm against *Aspergillus niger*. Similarly when the experiment was performed with antibiotic and nanoparticles extract, there was a synergistic effect with maximum zone of inhibition was 21mm respectively. Our results coincides with the findings of (Shreyamedda, *et al*., 2014).(Plate: 7 and Figure: 4).

Haemolytic Activity of The Nanoparticle Compounds Treated Against 5% Sheep Blood Agar

The study further made to elucidate the influence of MgOnanoparticle synthesized to assess the haemolysis (RBC). In the present study haemolytic activity was found to be less in MgO NPs extract whereas revealed 9.3 mm of zone of inhibition. Whereas, when magnesium acetate tetrahydrate due was given be an increased effect with toxic effect. The study further revealed when synergistic effect of antibiotics and nanoparticles were treated, the zone of inhibition was found to be low with 9mm in diameter.
(Plate: 8 and Figure: 5).

Anti–Inflammation Activity Of Nanoparticle Synthesis Compound Using Formalin Induced Paw Oedema

Anti- inflammation activity of Magnesium oxide nanoparticles in mice model was studies using formalin induced paw edema method. The relative percentage of edema induced inhibition by the test compound. (Aloevera ofmagnesium oxide nanoparticles) was recorded after 1, 2 and 3 hours. In control after formalin induced in the right paw exhibited 25mm of paw size, when compared to 10mm paw size, in rats before formalin induced paw size. The study with standard paracetamol as oral supplementation to the mice model during 1hour.It was found to be 32mm whereas on continuous exposal up tothree hours showed 40mm. When the test MgO nanoparticles was administrated the paw size was found to be reduced with 20mm. When the percentage of inhibition was taken into the consideration during one hour the paw size was found to be 23mm and during 2, 3 hours was exposal the percentage inhibition was progressively increased from 24mm and 29mm of paw size in mice model respectively (100mg/kg). (Plate:9, 10, 11 and Figure:6).

Anti Pyretic Effect of Nanoparticles Compounds Using Pyrexia Method

Antipyretic effect of MgO nanoparticles of aloe vera antipyretic potential of MgO nanoparticles synthesized compounds of aloe vera was evaluated by determining its effect an yeast induced pyrexia in albino mice, fever was induced in mice by subcutaneous injection brewer`s injection by dose of 100 mg yeast of mice below the nape of the neck. The site of injection was then massaged to spread the suspension into the tissues. The rectal temperature was recorded for all groups of mice before yeast administration. The rectal temperature was markedly elevated to 38.6^0c, 39.0^0c, 40.0^0c, 40.5^0c and 41.0^0c and for control mice was noted. Paracetamolas standard administrated to mice shown to be 38.0^0c, 37.0^0c, 40.0^0c, 39.2^0c, 38.3^0c and 38.0^0c. The rectal temperature observed on MgO nanoparticles extract of aloevera with a concentration of 100mg/kg revealed a significant reduction in rectal temperature with an increased concentration of 200mg of Mgo nanoparticles extract exhibited a remarkable reduction with 35.2^0c, 35.0^0c, 34.0^0c and 33.5^0c was recorded. (Plate: 11, 12, 13 and Figure:7).

Table 1 Phytochemical Analysis of Aloe Vera Of Nanoparticle

S.NO	Characteristics	Observation
1.	Test for protein	Positive
2.	Test for carbohydrate	Positive
3.	Test for Tannins	Positive
4.	Test for flavanoids	Positive
5.	Test for alkaloid	Positive
6.	Test for phenol	Positive
7.	Test for terepnoid	Negative
8.	Test for glycosides	Positive
9.	Test for quinine	Negative
10.	Test for saponins	Negative

DISCUSSION

Nanotechnology play an ever and increasing role in science, research and development seems more products based on nano structured materials are introduced to the market. The advance and applicable technology is nanotechnology, and it was derived from the term nano it is the billionth of meter or 10^{-9} m. Since in recent years the use of magnesium, silver as a biocide in solution, suspension in nanoparticulate form has experienced a dramatic revival.Plant mediated synthesis of nanoparticles, such as aloe vera is a green chemistry that interconnects, nanotechnology and biotechnology. Plants are natures chemical factories. A vast amount are secondary metabolites it found in all plants which can be exploited for biosynthesis of nanoparticles.Thus the advantages an using plant and plant derived materials for biosynthesis of metal nanoparticles has instigated our mind to investigate mechanisms and understand the possible mechanism of metal nanoparticles formation along with magnesium oxide an green synthesis. Several reports have shown a close relationship with total phenolic contents which should be used as antimicrobial and antifungal capacity.

PLATE:1. SAMPLE COLLECTION OFALOEVERA

PLATE: 2. SOXHLET APPARATUS

PLATE: 3. ALOEVERA EXTRACT

PLATE:4- PHYTOCHEMICAL ANALYSIS OF ALOE VERA OF NANOPARTICLE

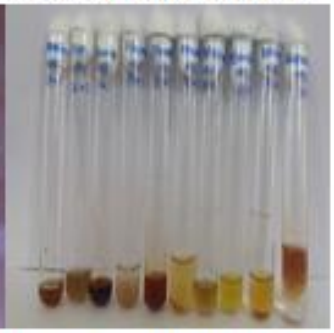


PLATE:5. NANO PARTICLE SYNTHESIS COMPOUND OF SEDIMENT PARTICLES

PLATE:6. NANOPARTICLE COMPOUND END PRODUCT

PLATE:7. ANTIMICROBIAL AND ANTIFUNGAL ACTIVITY AND SYNERGISTIC EFFECT OF NANOPARTICLE SYNTHESIS COMPOUND

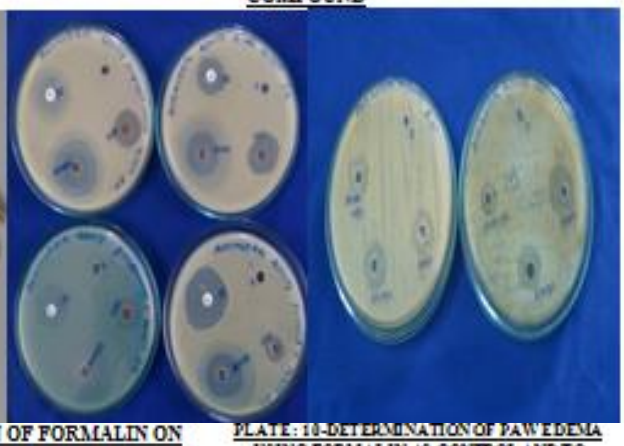


PLATE:8. HAEMOLYTIC ACTIVITY OF NANOPARTICLE SYNTHESIS COMPOUND

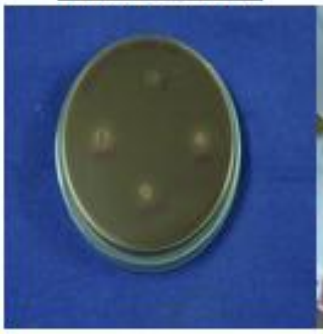


PLATE:9. INJECTION OF FORMALIN ON THE RIGHT HIND PAW OF MICE FOR ANTI-INFLAMMATORY STUDIES

PLATE: 10-DETERMINATION OF PAW EDEMA USING FORMALIN AS CONTROL AND TO CHECK EFFICACY OF M_gO NANOPARTICLES IN EXPERIMENTAL MICE MODEL

PLATE: 11- TO DETERMINE YEAST INDUCED PYREXIA METHOD

PLATE: 12- TO DETERMINE THE ANTI-PYRETIC ACTIVITY WITH ALOE VERA EXTRACT OF MAGNESIUM OXIDE NANOPARTICLE

PLATE: 13-ORAL ADMINISTRATION OF MAGNESIUM OXIDE NANOPARTICLE SYNTHESIS COMPOUND IN EXPERIMENTAL MICE

FIG:-1. X-RAY DIFFRACTION STRUCTURAL STUDIES

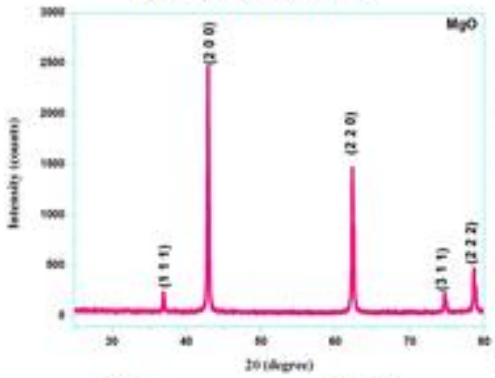


FIG : 2- SCANNING ELECTRON MICROSCOPE, MORPHOLOGICAL STUDIES

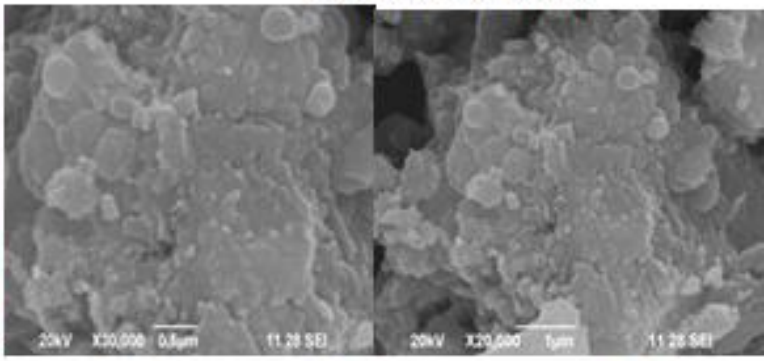


FIG:3.

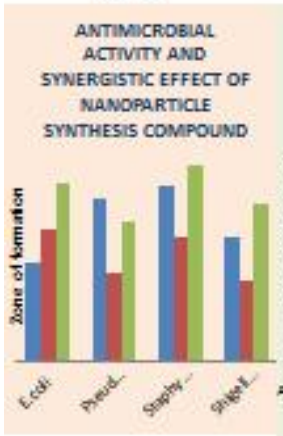


FIG:4.

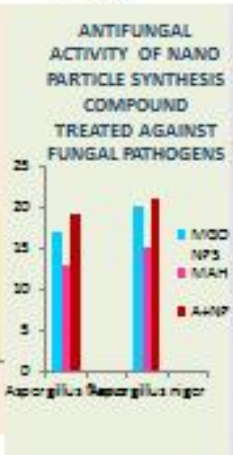


FIG:5.

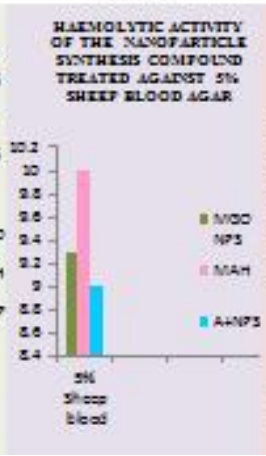


FIG:6.

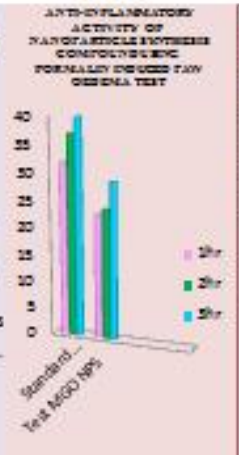
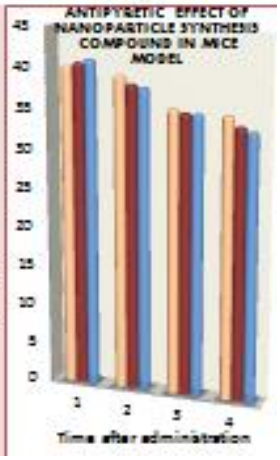


FIG:7.



The use of materials like plant extract bacteria fungi and enzymes for the synthesis of silver nanoparticlesoffer numerous benefits of eco-friendly and compatibility for pharmaceutical and other biomedical applications as they do not use toxic chemicals for the synthesis protocol silver has long been used as a disinfectant for example the metal has been used in treating wounds and burns because of its broad spectrum toxicity to bacteria silver nanoparticles have unique catalytic optical , electrical and antimicrobial properties which inhibiting 650 types of microbes growth as well as because of its reputation of limited toxicity to humans.In recent green synthesis of Mgo nanoparticles was achieved by using extracts of aloe vera, which possess medicinal values. Aloe vera is used an reducing agent instead of chemical compounds aloe vera is a perennial succulent belonging to liliaceae family. It possess anti-inflammatory oedema, anti-pyretic activity, promoting properties. In the present study synthesis of Magnesium oxide nanoparticles, with the aloe Vera extract, green synthesis it's an interesting and expanding research due to the potential application an eco-friendly development and novel technologies. To magnesium oxide nanoparticles was characterized and its size, structure of nanoparticles to confirmed with XRD technique. The synthesized Magnesium oxide nanoparticle its particle size, is calculated as 140 nm. This Scanning Electron Microscopic (SEM) study, revealed spherical shape nanoparticle, showing the boundary between each nanoparticle boundary between each nanoparticleThe study further experiment to analyzed XRD spectrum synthesized from the extract of aloe vera and exact nature of magnesium oxide nanoparticles formed can be deduced from the XRD spectrum from the sample our results, for compared with XRD spectrum of standard conformed that magnesium oxide nanoparticles formed in over experiments were in the form of nano crystals.Scanning electron microscope offer, nanometers resolution for measuring nanoparticle size. The plant aloe vera extract bio mass was precipitated and suspension above the precipitate was taken for SEM analysis. Scanning electron microscope analysis the revealed the spherical shape for magnesium oxide nanoparticles Silver nanoparticles are receiving an increased attention in the field of agriculture. The study of antifungal properties of green synthesized silver nanoparticles (AgNps) from Aloe vera leaf extract against two pathogenic fungus *Rhizopus*sp, and *Aspergillus* sp. The antifungal activity of Magnesium oxide nanoparticles revealed inhibition against *Aspergillus niger*and *Aspergillus flavus*. The hemolytic activity, was found to be increased with Magnesium acetate tetra hydrate, whereas, green synthesis of nanoparticles shown less hemolytic activity, observed in zone of inhibition. Fever is a complex physiologic response triggered by infections or aseptic stimuli. Elevation in body temperature occurs. When the concentration of prostaglandin E2 (PGE) increases within parts of the brain such as elevation contributes to a considerable alteration in the firing rate of neurons that control the thermoregulation process in the hypothalamus. It is now evident that most of the antipyretic drugs exert their action by inhibiting the enzymatic activity of cyclooxygenase and consequently reducing the levels of PGE2 within the hypothalamic region. A natural antipyretic agent with reduced or no toxicity is therefore, essential, (Sankar, *et al*.,2014). The anti-inflammatory performance of the MgO nanoparticles extract was tested for anti-inflammatory study with paw

oedema test. The result showed that the extract possessed promising anti-inflammatory activity. The formalin induced paw oedema is one of most important commonly employed techniques for evaluation of anti-inflammatory drug to inhibit oedema induced hind paw of mice in the plantar tissue of paw. In general MgO nanoparticles extract exhibited promising anti-inflammatory activity by oral administration at a dose of 100 mg/kg compared to the reference drug paracetamol and relative percentage inhibition of oedema recorded values after 1 hour was 3% and after 4 hours revealed 23%. It was noteworthy to emphasize a maximum inhibition with 60% after 4 hours was recorded. For Mgo nanoparticles extract which revealed an excellent anti-inflammatory activity. This may be attributed due to substitution of phenyl ring at fourth position which gives rise to increase anti-inflammatory activity.In tune with about discussion the effect of nanoparticle as antibacterial effect was tested with selected pathogens while the green synthesis of effect the tested bacteria. This effect may be due to interaction with cell wall of bacteria leading to the formation of cell wall. The anti-microbial activity of magnesium oxide nanoparticle of aloe vera revealed inhibition against pathogens, *Staphylococcus aureus* Accumulation of magnesium oxide nanoparticles in the bits cost permeability of cell membrane is also agreed with other investigated a specially have reported a similar findings. The results of other study, with the green synthesis of magnesium oxide nanoparticles tested have significantly proved, green synthesis have also effect on the fungus *Aspergillusniger*, and *Aspergillusflavus*. A average size of spherical silver nanoparticles was estimated to be 140 nm. Our results were in total arrangements with (PrathapChandran, *et al*., 2006).

CONCLUSION

A plenty of Mg^{+} were added to the extract of aloevera which contains small and large molecules and the other hand these biological molecule may act as reducer. The reduce Mg^{+} to Mg^{+} nanoparticles besides they were also responsible for stabilization for resulting nanoparticles. Nanoparticles present an extremely attractive platform for adverse range of applications. The single step process for biosynthesis of nanoparticles provided by it attracts more researchers to go for future developments in the area of electrochemical sensor, biosensors, medicine, healthcare and agriculture.The synthesis of nanoparticles in nano-biotechnology area has augmented its importance to create eco-friendly; cost effective, stable nanoparticles. From variety of investigations on nanotechnology for synthesis of nanoparticles it is found that it is safer and superior by using natural plants. With the huge plant diversity much more plants are still not reconnoitered for the synthesis of nanoparticles and its applications in pharmaceutical and agricultural industries.

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