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Anti Cataract Activity Of Synthesized Silver Nano Particles From Skin Of *Allium Cepa* Species

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Abstract: Allium cepa (Onion) is considered as the most used vegetable in the world. The most common disease that turns chronic is the cataract disease. The occurrence of blurry vision which requires a surgery, is major ophthalmic disorder. This paper focuses on the therapeutic application of the flavonoid extract from the skin of Allium Cepa. The extraction of flavonoids from onion peel and their combination with silver particles showed the activity at its rest as nano particles. The "lipid peroxidase" test at the lab were tested against the cataract cell lines, which therefore resulted: only onion peel - 1.47 µmoles MDA/ gmFW ; Nano sized skin of *Allium cepa* - 3.25 µmoles MDA/ gmFW. From the observations, Anti cataract activity of the silver nano particles from skin of *Allium cepa* showed better results than skin of *Allium cepa*. The nano particles were analyzed using SEM and XRD.
Key words: Skin of *Allium cepa*; SEM; XRD; Anti Cataract activity; Silver nano particles; Lipid Peroxidase.

1. Introduction

Allium cepa, is the most used vegetable with rich in natural sources like flavonoids and organic sulphur compounds.
There were various tests conducted for the extraction of flavonoids using water, methanol and ethanol using soxhlet extraction method. Out of the three , methanol proved to be the best extraction solution which resulted in maximum amount of flavonoid extraction form *Allium cepa* peel.

The most frequent chronic disease occurring is the major ophthalmic disease cataract. The patient suffering with cataract has blurry vision, because of the layer formed on the lens of the eyes. Mostly it is treated with a minor surgery. This paper mainly focuses on the simple technique to remove the cataract in the simplest and the safest way, using flavonoid extract from onion peel and converting it into silver nano particles. The size of the silver nano particles were analyzed using the SEM and XRD analysis.

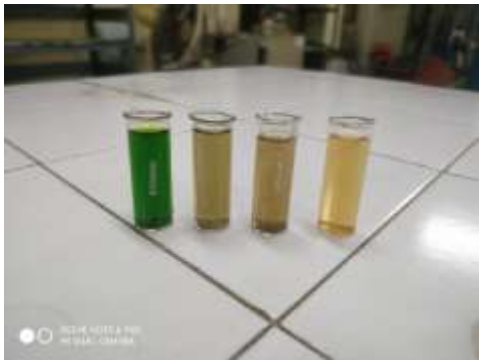
Silver nano particles formed in the combination of the flavonoid with the silver nano particles result in the removal of cataract. The test against the cataract , was conducted at the laboratory level

called " The lipid peroxidase " test. Lipid peroxidation, a well-established mechanism of cellular injury in plants and animals, is used as an indicator of oxidative stress in cells and tissues. Lipid peroxides are unstable and decompose to form a complex series of compounds including reactive carbonyl compounds. Polyunsaturated fatty acid peroxides generate malondialdehyde (MDA) and 4-hydroxyalkenals (HAE) upon decomposition, and the measurement of MDA and HAE has been used as an indicator of lipid peroxidation (1). This method is designed to assay either MDA alone (in hydrochloric acid) or MDA in combination with HAE (in methane sulfonic acid).The extraction, conversion and application were carried out stage wise.

2. Materials And Method :

Extraction of flavonoid from *Allium Cepa*:

Methanol was the solvent used for the maximum extraction of Flavonoid. The yield of the flavonoid extracted was quantitatively measured using UV spectrometer at 415nm. 200ml of 80% methanol was prepared and was kept still of the extractor. 2gms of skin of Allium Cepa was placed in thimble with the help of a filter paper and then condenser was connected to it. Now the total apparatus was placed in the heater. Using the Soxhlet apparatus, continuous extraction was done for 10hrs. The resulting extract



was taken and the later the sample of 100ml was converted into silver nano particles in combination of flavonoid and $Agno_3$.The extracted solvent of silver nitrate was dried and given for SEM and XRD analysis.

Fig. 1; Preparation of Silver Nitrate Nanoparticles of *Allium cepa*

3. Principles of procedure

This assay is based on the reaction of a chromogenic reagent, N-methyl-2-phenylindole (R1), with MDA and 4-hydroxyalkenals at 45°C. One molecule of either MDA or 4-hydroxyalkenal reacts with 2 molecules of reagent R1 to yield a stable chromospheres with maximal absorbance at 586 nm.

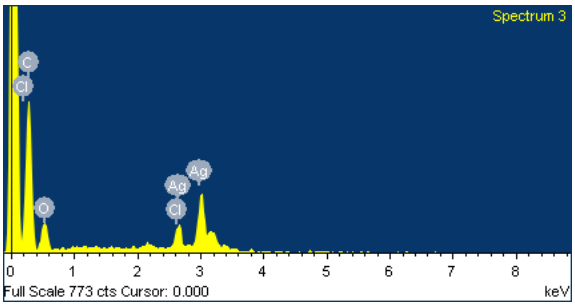
Reagents

0,1% w/v TCA

0,5% TBA diluted in 20 % (w/v) TCA

Procedure

- Homogenize 0.1 gm of leaf tissue by adding 0.5 ml 0.1 % (w/v) TCA.
- Centrifuge the homogenate for 10 min (15000g, 4.0ºC)
- Collect supernatant and mix 0.5 ml of supernatant with 1.5 ml 0.5% TBA diluted in 20 % TCA. Incubate in water bath at 95oC for 25 min.
- . End reaction by incubating on ice. In case the solution is not clear, centrifuge for a further 5 min (15000 x g, 4.0ºC)



- Measure the absorbance at 532 and 600 nm.
- OD600 values are subtracted from the MDA-TBA complex values at 532 nm and MDA concentration is calculated using the Lambert-Beer law with an extinction coefficient εM= 155 mM-1cm-1. Results are presented as µmols MDA g-1FW.

Formula = (OD532)-(OD600)/155 X 1000

Results and discussions

The sample resulted in better anti cataract activity was one with the silver nitrate . The resultant of the lipid peroxidise test was more.

Sample with flavonoid = 1.47 µ moles MDA/gm FW

Sample with silver nitrate and flavonoid = 3.25 µ moles MDA/gm FW

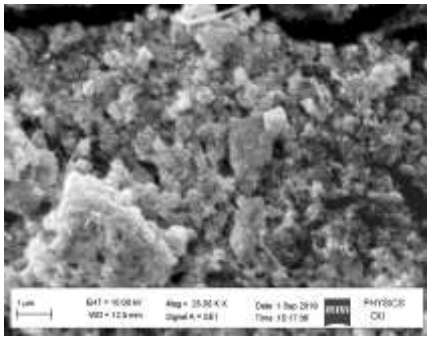


Fig. 2. SEM and XRD images of silver nitrate nanoparticles

4. Conclusion:

The idea behind this whole work was to use the flavonoid extract from the onion peel for the best medicinal application, for the most chronic problem like "Cataract". The result observed after the conversion of the extract of flavonoids on conversion into silver nanoparticles showed a very good result against the cataract cells. Hence, this concluded that the cataract can be cured other than surgical methods.

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