Currently, there is increasing interest in the health and welfare benefits of herbs and botanicals. This is with good reason as they might offer a natural safeguard against diseases and be a substantial treatment for certain chronic diseases.

Oxidative stress is one of the leading cause of chronic diseases due to internal and external free radicals attack to the body homeostasis in both developed and developing countries. This is based on an assumption that early prevention and treatment of oxidative stress will prevent the development of the associated morbidity and mortality. Some drugs which are used to treat disease themselves cause side effect. In recent years, the use of natural antioxidants present in food and other biological materials has attracted considerable interest due to their presumed safety, nutritional and therapeutic value. Hence it is imperative to find out drugs with minimum side effect and for its effective antioxidant activity.

The present study was evaluated for protective role and antioxidant activity of ethanolic extract of the fruit of Lagenariasiceraria against chronic diseases such as diabetes, hepatotoxicity and depression as well as their associated oxidative stress.
In present study the powder of Lagenariasiceraria fruit was investigated for the physical constants such as total ash, loss on drying and extractive values; were determined.

The powdered drug material was subjected to phytochemical screening and phytochemical investigation showed the presence of carbohydrates, proteins, alkaloids, amino acids, steroids, glycosides, flavonoids, saponins, terpenoids, tannins, vitamin C (Ascorbic acid) and polyphenolic compounds.

This was subjected to thin-layer chromatography, High performance thin layer chromatography and also for 1H-NMR, 13C-NMR, U.V. I.R. spectral studies for characterization. It is reveal their identity as oleanolic acid (I), β sitosterol (II), campesterol (III), isoquercitrin (V) and kaempferol (V).

The acute toxicity study was conducted as per OECD guideline 420. It was found that the ethanol, aqueous and chloroform extracts even at 2000mg/kg dose had not shown any mortality. Hence, it confirms that it is practically non-toxic in nature.

In this research, diabetes was induced by alloxan, hepatotoxicity using CCl₄ and two different animal models for depression such as forced swimming test and tail suspension test.

Treatment with EELS has reduced the elevated levels of serum glucose in alloxan induced diabetic rabbits.

Treatment with ethanolic extract has brought back the elevated levels of SGPT, SGOT, ALP, Total protein, Total and Direct Bilirubin, in CCl₄ induced hepatotoxicity in rabbits.
It was restored the mean duration of immobility time against both forced swimming test and tail suspension test of rats.

It was found to possess triterpenoids, flavonoid and sterol content thus the protection can be attributed to be decrease in lipid peroxidation formation, restoration of superoxide dismutase (SOD), Catalase (CAT) and glutathione (GSH) status.

The study findings have been suggested that the tail suspension is less stressful than forced swim test and has greater pharmacological sensitivity.

Treatment with combination therapy has shown synergistic activity when compared with monotherapy.

Treatment with high dose (400 mg/kg) with therapeutic conventional drug has shown window effect in rat tail suspension test.

The treatment with EELS increased the reduced body weight of all the experimental groups, except tail suspension test model.

Ethanolic extract of the fruit of Lagenariasiceraria has demonstrated dose dependent in vivo antioxidant activity by increasing SOD, CAT, GSH and restoring lipid peroxidation activities. The extract of Lagenariasiceraria has shown the significant antidiabetic, hepatoprotective, antidepressant activity and antioxidant activity.