Medicinal plants have been used by all civilizations as a source of medicines since ancient times. Interest in medicinal plants as a re-emerging health aid in the maintenance of personal health and well being has been fuelled by rising costs of prescription drugs, and the bioprospecting of new plant derived drugs (Sharma et al., 2010). The plant kingdom is a treasure house of potential drugs and in recent years there has been an increasing awareness about the importance of medicinal plants. Drugs from the plants are easily available renewable resource, less expensive, safe, and efficient and rarely have side effects. The plants which have been selected for medical use over thousands of years constitute the most obvious choice for examining the current search for therapeutically effective new drugs such as anticancer drugs, antimicrobial drugs (Phillipson and Wright, 1996) and antihepatotoxic compounds (Evans, 1996). About 80% of the world’s population depends on herbal medicines and the governments of third world countries are unable to sustain a complete coverage with western type drugs have encouraged the rational development of traditional treatment. The chemical constituents of plant medicines are the product part of the physiological activities of living plants and hence they are believed to have a better compatibility with the human body.

The World Health Organization (WHO) has reported that around 21,000 plants had been used for medicinal purpose in the world. About 500 higher species had been thoroughly investigated as potential source of new drugs. Nearly 119 pure chemicals were extracted from 90 plant species. In the recent times, there has been growing interest in exploiting the biological activities of different ayurvedic medicinal herbs (Naik et al., 2003). There is a growing tendency all over the world to shift from synthetic to natural products including medicinal plants. Thus medicinal plants
constitute a group of industrially important crops which bring appreciable income to the country by way of export (Bhattacharjee, 1998).

In developing countries, a large proportion of the rural population depends on biodiversity for livelihood, nutrition, and health. Higher plants are the major sources of natural products and are used as pharmaceuticals, agrochemicals, flavours and fragrance, ingredients, food additives and pesticides (Balandrin and Klocke, 1988). Among the estimated 250,000-500,000 plant species, only a small percentage has been investigated phytochemically and the fraction submitted to biological or pharmacological screening is even smaller. Thus any phytochemical investigation of a given plant will reveal only a very narrow spectrum of its constituents. Historically pharmacological screening of compounds of natural or synthetic origin has been the source of innumerable therapeutic agents. Random screening as a tool in discovering new biologically active molecules has been productive in the area of antibiotics. Medicinal plants are valuable antimicrobial agents and are a source of many potent and powerful drugs (Cathrine and Prabavathi, 2011).

The medicinal value of the plants lies in bioactive phytochemical constituents that produce definite physiological action on the human body (Akinmoladun et al., 2007). These natural compounds formed the foundations of modern prescription drugs as we know to day (Goh et al., 1995). Phytochemical is a natural bioactive compound found in plants, such as vegetables, fruits, medicinal plants, flowers, leaves and roots that work with nutrients and fibers to act as a defense system against disease or more accurately, to protect against disease. Phytochemicals are divided in to two groups, which are primary and secondary constituents, according to their functions in plant metabolism. Primary constituents comprise common sugars, aminoacids, proteins and chlorophyll while secondary constituents consist of alkaloids, terpenoids and
phenolic compounds and many more such as flavonoids, tannins and so on (Krishnaiah et al., 2007).

Coastal vegetation is an ecological store house rich in biodiversity and has bright ecological value. Fishing communities living close to and interacting with these coastal flora have gained unique cognitive understanding of the ecosystem and form of resource utilization pattern. Local communities have developed their own traditional system of utilizing these coastal plants for medical and nutritive purposes. Most of the coastal plants distributed in stressed condition in saline soil are succulents. Halophytes are found in a range of environmental conditions depending on their ability to tolerate various combinations of salts in the substrate (Song et al., 2008) and may be grouped in various ways such as into coastal, near coastal and inland species depending on the proximity to the open sea or according to the type of habitat they occupy such as salt desert, salt flat or salt marsh plants (Gulzar and Khan, 1998).

Many halophytes are of economic value and industrial applications in the form of essential oil, medicine, alcohol, fiber, latex, pulp and cosmetics. For further needs, understanding the nature of stress tolerance genes in agriculture, forestry and horticulture is of utmost importance. In the salt stressed environment they produce phytocomponents of medicinal importance and these may also be useful in future biotechnologic programs. Halophytes are rich in protein, vitamin-A, vitamin-C, Ca, Fe, I, Mg, Na and aminoacids, low in calories, fat contain no cholesterol and add fiber to the diet. Marine plants are traditionally used in cosmetic formulations as extracts and essentials oils. The coastal sand dune vegetations are also regarded as potential source of food, fodder and pharmaceuticals. The conventional knowledge of folk
medicine is deteriorating alarming with loss of biodiversity mainly in the coast (Stanley, 2008).

Many infectious diseases are known to be treated with herbal remedies throughout the history of mankind. Even today plant materials continue to play a major role as therapeutic remedies in many developing countries (Ody, 1993). As a consequence of an increasing demand for biodiversity in the screening programs seeking therapeutic agents from natural products there is now a greater interest in marine organisms. Marine halophytes are the specialized group of plants adopted for high saline conditions which include mangroves, seaweeds, sea grasses, and blue green algae. They are also proven to have rich source of structurally diverse bioactive compounds with valuable pharmaceutical potential. (Ostensvix et al., 1998; Ravikumar et al., 2002; Mayer and Hamann, 2002 and Suresh et al., 2002). Mangroves plants and their products have been extensively used in traditional plant medicine. These plants are well known to have diverse natural products with great pharmaceutical importance and also exhibiting antimicrobial, antiviral, antilarval and antiinsecticidal activity (Kumar et al., 2011). Seeds of various halophytes, such as Suaeda fruticosa, Arthrocnemum macrostachyum, Salicornia bigelovii, S. brachiata, Halogeton glomeratus, Kochia scoparia, and Haloxylo n stocksii possess a sufficient quantity of high quality edible oil with unsaturation ranging from 70-80% (Weber et al., 2001). Shoots of Salicornia bigelovii, Sesuvium portulacastrum, Chenopodium album, Portulaca oleracea, and Suaeda maritima are used for vegetables, salads and pickles in various parts of the country (Dagar, 1995). Plant based antimicrobials represent a vast untapped source of medicines even after their enormous therapeutic potential and effectiveness in the treatment of infectious disease, hence further exploration of plant antimicrobials needs to occur (Parekh et al., 2007).
The coastal herbal diversity of Tamil Nadu Coast is little recognized for
conventional therapeutic values, The Coast of Thoothukudi is the part of Gulf of
Mannar Biosphere Reserve situated which lies 8° 47’ to 9° 15’ N latitude and 78° 12’
to 79° 14’ E longitude respectively. This area is covered with mangroves and their
associates and is endowed with combination of ecosystem including scrub jungle,
aquatic vegetation, coastal and terrestrial vegetation.

For the present study, the two taxa of Thoothukudi coast - *Sesuvium
portulacastrum* (L.) L. and *Sauropus bacciformis* (L.) Airy Shaw are selected.
*Sesuvium portulacastrum* (L.) L belongs to the family Aizoaceae is commonly known
as sea purslane. (Robert and Frank, 1997). It is distributed throughout the world and it
is used as an ornamental plant and as green vegetable. (Rabhi et al., 2010, Mathieu
and Meissa, 2007). Traditional healers in Zimbabwe and South Africa use the plant in
traditional medicine as a remedy for fever, kidney disorders and scurvy (Rojas et al.,
1992; Lokhande et al., 2011).

The plant *Sauropus bacciformis* (L.) Airy Shaw belongs to the family
Euphorbiaceae. It is a herbaceous taxon distributed in the coastal region. It is used by
the rural folk as a green vegetable and also as a medicine for gastrointestinal problems
and skin diseases (Muralidharan and Narasimhan, 2012). The related taxon *Sauropus
androgynus* (star gooseberry) is cultivated in India for consumption and commercial
use. It is used as nutraceutical in health care and in prevention and treatment of
diseases and it has anticancerous properties (Padmavathy et al., 2011; Kanchanapoom
et al., 2003).

Perusal of previous literature reveals that there is fragmentary reports on
phytochemistry and bioactivity of *Sesuvium portulacastrum* and *Sauropus
bacciformis is unexplored for its medicinal properties. In view of this fact, the present investigation is undertaken to elucidate the pharmacognostical characters, phytochemical profile and pharmacological potential of these taxa are carried out with the following objectives. Both the selected taxa are used by the rural folk as green vegetable so to ascertain their usefulness as food a brief study on the nutritive value is also carried out.

**Objectives:**

- To investigate the macroscopic and microscopic characteristics of areial parts of *Sesuvium portulacastrum* and *Sauropus bacciformis* to establish the pharmacognostical standards of the plants.
- To carry out the pharmacochemical characterization of leaf and stem part of the two selected taxa through ash and extractive values, fluorescence analysis and preliminary phytochemical screening to establish the phytoconstituents present.
- To study the HPTLC profiles of methanol extracts of leaf and stem methanolic extracts of *Sesuvium portulacastrum and Sauropus bacciformis* to confirm the presence of alkaloids, phenols, flavonoids and steroids.
- To study the GC-MS analysis of methanol extracts of leaf and stem of *Sesuvium portulacastrum and Sauropus bacciformis* to identify the phytoconstituents present in the plants.
- To evaluate the proximate nutrient and mineral composition of the selected plants in order to ascertain their possible usefulness as food and formulation of drug.
To assess the antioxidant activity of different solvent extracts of leaf and stem of the two selected taxa by radical scavenging activity and methods based on reducing ability.

To evaluate the anticancer activity of methanol extracts of whole plant of *Sesuvium portulacastrum* and *Saurops bacciformis* in EAC (Ehrlich's Ascite Carcinoma) induced rats.

To investigate the antidiabetic activity of methanol extracts of whole plant of the two taxa in alloxan induced diabetic rats.

To evaluate the hepatoprotective activity of methanol extracts of whole plant of the selected plants against hepatic toxicity induced by carbon tetrachloride (CCl4).

To evaluate the antiinflammatory activity of methanol extracts of whole plant of the two selected taxa on carageenan induced oedema in rats.