Numerous synthetic drugs are used to cure various diseases caused by pathogenic microbes and other diseases caused by the malfunctioning of organs and other deficiency syndromes. Though synthetic drugs are effective therapeutically, they are prone to produce side-effects like skin allergies, metabolic disorders and haematologic reactions. So, the focus of research is centred on finding ideal curative drugs, which are free of such side-effects. Hence the interest on the curative agents used in traditional systems is gathering momentum.

On this background, a search for drugs in the ancient systems of medicine is going on in the various parts of the world. The Indian systems of medicine like any other ancient systems is rich in different varieties of drugs from various natural sources like plants, animals, minerals etc. Works are going on to screen all the available plants, animals and minerals as mentioned in the old texts (Murugesan et al., 2003). The use of plants have been identified and used to cure many bacterial infections in man. The use of plants in traditional medicines have been documented to some extent (Cragg Newman, 2002). Likewise, the use of animals in traditional medicines was also being documented.

Even though it was difficult to fathom the deep oceans in the olden days, the traditional medical systems abound with knowledge of drugs of marine origin. The marine flora and fauna is as diverse as the organisms on the terrestrial zone.
The marine algae of diatoms, brown and the red algae and the other moving wonders of the marine fauna make an interesting study of therapeutics point of view. Thus, screening of such alga and other marine animal sources are being screened as potential drug sources (Newman et al., 2000).

There is mention in ancient texts of Tamil Literatures and Siddha-Ayurveda texts, the use of such natural resources as drugs to cure human diseases. Following this the search for newer drugs from marine organisms yield good results. Instead of starting from the available literatures, a study is made to interview the traditional practitioners practicing medicine for a long time under various banners like Siddha, Ayurveda, Unani etc. to collect details about newer drugs. The study is limited to the drugs of marine origin only, and the area covered is the two districts of south Tamil Nadu namely, Kanyakumari and Tirunelveli. Both these two districts cover a vast area of seashore and boast of many a number of traditional practitioners practicing medicine.

Most of these practitioners boast themselves as herbalists (drugs of plant origin only) since herbals are considered to be more safe than the other forms. Hence it is difficult to gather knowledge of marine drugs from these sources. Many are successfully practising 'varma' – a martial art as prescribed in Siddha texts. A considerable number of practitioners responded to the questions regarding the marine drugs. Out of this, many people preferred in choosing the drugs that are available in the open market and only a very few admit that they are doing their own drugs involving various methods like 'putam'.
Various laws enacted by the State/Central governments aiming at the conservation of the ocean wealth force the practitioners to close their mouth. They are helpless to eulogise the therapeutic values of drugs like sea horse, star fish, amber etc. In the U.S.A. even possession of Amber is against law. On perseverance, only details about nine drugs of marine origin were collected in the present study. Common table salt is considered to be a drug in Siddha. In the form of Uppu chenduram, it is prescribed for ulcer. Likewise, lot of opinions flow in regarding the wonder drug ‘muppu’. Likewise, Nandukkal parpam (Fossil stone crab) is considered to be a very effective drug for lithotryptic action (Kandasamy Mudaliar, 1936). Some practitioners strongly believe and show many evidences of curing renal calculi by prescribing this single drug alone. These practitioners strongly believe in ‘pathya’- discriminating certain food stuffs during the intake of the drug.

All mollusks, having a shell are rich in Calcium. So, almost all the shells are therapeutically valuable to supply Calcium to the human body. Muthu chippi, chank, shell of Sepia, the carapace of turtles are considered to be the cheap natural sources of Calcium. Since most of the marine algae are rich sources of Iodine, these people believe the intake of ‘kadal paasi’ collectively supply iodine and hence, preventive in goiter.

With regard to drug discovery and development, however, the oceans started to attract interest from pharmaceutical companies and research institutions only some 50 years ago with the discovery of the sponge derived nucleosides
spongorthymidine and spongouridine. Since then well over 14000 different natural products from marine organisms have been described, hundreds of patents describing new bioactive marine natural products have been filed. But except a few drugs like Acyclovir (anti-viral) and Cephalosporin (antibiotic) no other drug was launched to the drug market successfully (Jaiprakash, 2003).

About two thirds of the earth is oceanic waters. They harbour a unique biota, distinct from that of terrestrial and fresh water habitats. The biomass produced from the marine ecosystem provides abundant resource for research, development and production of new pharmaceuticals (Hug-Shi Guan, 2003). Marine invertebrates such as sponges and Molluscs are the most interesting sources of pharmacologically active metabolites. At least 12 marine-derived compounds are currently under clinical investigation for use as anti-cancer agents. Deep water marine habitats constitute a relatively untapped resource for the discovery of drugs derived from natural products.

There is a medical goldrush going on, not in the laboratory but on the sea floor. Marine scientists are scouring the ocean for organisms that naturally produce chemical compounds used for biological defence and health enhancement. With literally billions of under sea life forms that have yet to be studied, scientists are finding that the oceans could become the biological mother load for deriving 21st century medicines. Like the Tropical Rain forests, the coral reefs hold considerable untapped potential in the science of medicine. In Japan's reefs- one of the most studied coral coasts in the world- a chemical called kainic
acid, which is used as a diagnostic chemical to investigate Huntington’s chorea, a rare but fatal disease of the nervous system.

World over the Allopathic system of medicine dominates the ‘Traditional Medicine and Healing Art’ due to its strong link with modern science and Technology. However, the WHO documented that the vast majority of people (75 to 80 %) living in the developing world prefer to resort to traditional remedies for common ailments and chronic diseases. This is due to the high cost of modern hospitalization and expensive and toxic drugs with many side-effects. India is one of those countries in the world where traditional medicines have found their use in well-developed systems of medicine (Germno, 2001).

The seas and oceans contain about 5,00,000 species of marine organisms. Now this field attract the attention of not only the natural product chemists but also those of marine biologists, biochemists, pharmacologists etc. Almost all the macro-organisms of marine origin were screened by the ancient vaithyars for their drug value. The finished drugs, mostly in the form of ‘parpam’ are marketed by reputed pharmaceutical companies. The role of Siddha drugs of marine origin, in alleviating the disease symptoms in contrast to the modern medicines is commendable since most of the indigenous drugs are safe to administer and they are very effective in curing diseases like ulcer.

Acute gastric ulcers are circular and rarely penetrate beyond the mucosa. By the acid digestion of extruded blood in contrast to chronic peptic ulcers, acute stress ulcers are found anywhere in the stomach (Ramzi S. Cortan, 1994). Chank
parpam is one of the cheap and best antacids to soothe the peptic ulcer. Likewise, asthma is a disease characterized by hyper-active airways leading to episodic, reversible broncho-constriction, owing to increased responsiveness of the tracheobronchial tree to various stimuli. These allergic symptoms are very much controlled by Cowrie, pearl, pearl-oyster parpam. It is time to screen these ancient drugs to isolate the active principles from these ‘parpams’ to find out newer drugs. The research of interest in the field of marine pharmaceuticals lie on the identification, isolation of the active substance, genetic engineering, micro-gene pharmaceutics and innovative drug design (Mariny Bettolo, 1980).

Oceans are extremely rich in living resources. Even though hundreds of million tones of organic materials are produced in the world oceans every year, only a small fraction is recovered as fish and the like for human consumption. Using the advance technologies, attempts should be made to harvest the potential medicines from the marine sources (Padmakumar, 1997).

The modern concept for the treatment of human ailments comprises natural products with unusual structures and functions derived from marine plants and animals. The various biodynamic agents isolated from marine origin have been developed in recent years. Some of the isolates, for example Cephalosporin, Cytosine, Saxitoxin, Didemins, Kainic acid etc., are being used clinically. The following brief outline gives an indication about the current developments in marine bioactive substances and drugs.
1. **Cephalosporins:** Discovered in the 50’s from a marine fungus, *Cephalosporium acremonium*. Modification of the original cephalosporin has led to the life saving antibiotics active against microbes insensitive to penicillin and ampicillin.

2. **Istamycin A&B:** Isolated from marine *Streptomyces tenjimariensis* against gram positive and gram negative bacteria, including those with known resistance to amino glycoside antibiotics.

3. **2, 4-Dibromo-6(3,4 tribromo pyrrole-2yl) Phenol:** Highly brominated pyrrole phenol possessing antibiotic properties, from marine *Pseudomonas bromoutilis*.

4. **Kainic acid:** A valuable antihelmintic used clinically in Japan against parasitic roundworm, tapeworm isolated from marine red algae namely *Digenea simplex*.

5. **Domoic acid:** Another valuable compound isolated from dried red algae *Chondria armata* effective in expelling ascaris and pinworm without any side effect.

6. **Bryostatins:** A group of macrolide known as bryostatins, isolated from *Bugula neritina*, posses pronounced anti-tumor activity.

7. **Spongouridine:** Isolated from Carribean (West Indies) sponge, *Cryptothya crypta* has shown promising anti-tumor and antiviral activities.

8. **Spongothymidine:** Isolated from Carribean(West Indies) sponge, *Cryptothya crypta* has shown promising anti-tumor and antiviral activities.
9. **Holothurins**: Toxic tri-terpenoid glycosides, obtained from sea cucumbers *Actinopyga agassizi* are found to inhibit the growth of sarcoma and adenocarcinoma mice. Recently two cytotoxic saponins rhelothurium A&B, have been isolated and both the glycosides have shown potent anti-tumor activity.

10. **Dolatriol**: Isolated from marine mollusc *Dollabella auricularia* has pronounced antileukemic activity.

11. **Carageenan**: Sulfated polysaccharide found to possess non-immune inflammatory response eg. rat paw edema, has also been injected into sinovial fluid of animals to produce anti-inflammatory drugs.

12. **Manolide**: A new steroidal lipid from Pacific Ocean sponge is a powerful anti-inflammatory substance and a pain killer.

13. **Prostaglandins**: (15-epi-PGA2 acetate & 15 S PGA2 ): The richest natural source of prostaglandins, so far discovered in the soft coral *Plexaura hamomala* found in the Caribbean sea. Some prostaglandins have also been isolated from red algae, *Gracilaria lichenoides* PGE2 which showed anti-tumor activity.

14. **Saxitoxin**: Tetradotoxin from the fig fish and shell fish is a deadly toxin. The one isolated from butter clam *Saxidomus giganteus* has marked hypotensive effect which diminishes at lower doses. Also isolated from liver of puffer fish, possessing cardiovascular activity.

15. **Nereisotoxin**: A number of halogenated compounds isolated from marine red algae, *Plocamium cartilagineum* have insecticidal properties.
16. **Caulerpin**: A pigment with indole structure isolated from *Caulerpa species*, has plant growth regulatory activity similar to indole auxins.

17. **b-Carboline**: Isolated from sponges, *Eudistoma olivaceum* has potent antiviral activity.

18. **Avarol and Avarone**: Isolated from sponge, Diced avara, inhibit immunodeficiency virus, have high therapeutic indices and the ability to cross blood brain barrier, treatment of AIDS.

The Pharmacopoeial Laboratory for Indian Medicine (PLIM) is a subordinate office of the Ministry of Health and Family Welfare (Dept. of AYUSH), Govt. of India and was established in 1970 (Rakesh K. Sharma, 2006). The various objectives of PLIM include development of new single drugs and compound formulations included in Ayurveda, Unani and Siddha Pharmacopoeia and it will serve the mankind in the coming days, if it hunts the seas.

There is a medical goldrush going on, not in the laboratory but on the sea floor. William Femical, Director of the Centre for Marine Bio-technology and Bio-medicine at the Scripps Institution of Oceanography has found a potential new source of antibiotics, as well as anti-cancer and anti-fungal medicines,
microscopic mud-dwelling organisms from the deep sea. Femical found over 5800 new micro-organisms; 30% of them show promise as antibiotics and antifungals and 80% are having anti-cancer potential (Karen Lurie, 2002). Marine scientists are scouring the ocean for organisms that naturally produce chemical compounds used for biological defence and health enhancement. With literally billions of under sea life forms that have yet to be studied, scientists are finding that the oceans could become the biological mother load for deriving 21st century medicines (Sundararaj et al., 1996).

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There are wide and empirical differences in the development and use of traditional medicines and modern medicines. These cannot be compared to
modern medicine in a particular disease because of the fact that modern drugs are one chemical substance, act on specific receptors, have definite response, good or ill effects known and unknown, immediate or delayed and are foreign to human system. Traditional medicines are natural to human body system as a medicine, their bio-availability is high and is according to the need of the body. These have medicines, minerals and vitamins all in one (Kuppusamy Mudaliar, 1979).

Marine drugs are the best 'Natural Medicines'. They come from nature and help man naturally through their properties as medicine or nutrition. The Traditional medicines have helped human race to survive on earth for thousands of years. Today, time has come when all medical scientists have to think on these lines for better future health and survival of mankind. The explosion of modern drug in last four decades is like explosion of nuclear weapons. Reports are that 14 % people all over the world die due to treatment with modern drugs, let us save them by our herbs (Rohde je, 1984). WHO acknowledges that ¾ quarter of the world's population uses herbs for their health care.

Some key institutions in the field of Marine Biotechnology are Scripps Institution of Oceanography, California, Harbor Branch Oceanographic Institution, Florida, Astra Zeneca R and D at Griffith University, Brisbane, Australia, Pharma Mar SA of Spain and the Marine Biotechnology Institute in Japan. Following the foot steps of the above institutions CASMB, Annamalai University and other institutions coming under various Indian Universities are screening the marine sources for new drugs.
Even before the advancement of modern technology, the indigenous medicines are abound with drugs of marine origin. Almost all the macro-organisms of marine origin were screened by the ancient vaithyars for their medicinal value. The finished drugs, mostly in the form of 'parpam' are marketed by reputed pharmaceutical companies. The role of Siddha drugs of marine origin, in alleviating the disease symptoms in contrast to the modern medicines is commendable since most of the indigenous drugs are safe to administer and they are very effective in curing diseases like ulcer (Kuppusamy Naidu, 1900).

The number of traditional practitioners selected for the present study was fifty (twenty three from Kanyakumari District and twenty seven from Tirunelveli District). These vaithyars have acquired their knowledge and practical experience directly from their 'gurus' (who were either their parents/grand-parents or 'asaans'). And the knowledge was imparted and practiced from generation to generation in a chain like lineage. From their early childhood, they are exposed to the preparations of drugs which gives them a thorough grasp of the art of healing.

In the present study, by following a rational methodology, by close observation and recording their experience, it was found that Traditional Practitioners (Siddha, Ayurveda and Unani) are using marine animal substances to prepare curative agents like parpams (Bhasmams) etc. They are using mainly nine marine substances as listed in table. Out of this nine, three medicinal preparations are selected for detailed study in this endeavour. They are

1. Sangu parpam
2. Palagarai parpam and
3. Pavala parpam.

All these three parpams are used in a wide variety of diseases and they exert a very good therapeutic effect. It is worth noting that for different conditions, different adjuvants (vehicles or ‘anupanams’) are selected.

Sangu parpam has anti-ulcer activity (Sangu parpam in ghee-pyloric ligation method and analgesic activity and also antibacterial activity.

Palagarai parpam has antibacterial activity anti-pyretic activity, wound-healing activity and anti-histamine activity.

Pavala parpam has acute anti-inflammatory action (hind-paw method), Chronic anti-inflammatory action (cotton pellet method), hypoglycaemic action (in Rabbits) Analgesic action and anti-microbial action.

These findings corroborate the rationale of using the parpams for the various conditions by traditional practitioners. Moreover Siddha literature also mentions the various indications for use of parpams. The method of preparation of parpams also reveals that the particle size is so small (microfined) that it may aid absorption effectively in the digestive tract.

Though these marine natural products are also used as mathirai (Tablets) and other forms, about 70% of preparations used are in parpam form as observed and recorded.
The results of this study indicate that extensive work of marine products will enrich our preparations, besides other drugs. At the same time the active principles and other molecules that exert the therapeutic and beneficial health effect can be identified in the drugs already in wide usage.

SUMMARY

Life evolved billions of years ago in the seas, and it is here that one finds the greatest diversity of life. The potential of naturally produced chemicals in curing diseases has been known for thousands of years, and over 60% the currently prescribed drugs can be traced back to nature. However, almost all of these have come from terrestrial organisms. So, why have marine organisms been ignored for so long despite their greater diversity? Finding a potential pharmaceutical from nature can be seemed akin to finding a needle in a haystack. There is little recorded usage of marine species to treat diseases, whereas there is a wealth of information about terrestrial species in ancient and more recent herbals, including ethnobotanical studies.

Most of the vast stretch of land is covered by water and the marine aquatic ecosystem provided drugs to the indigenous medical systems of the world. Search for new drugs originally started from plants and animals and minerals of the terrestrial ecosystem. Of late, the search was extended to the deep oceans also. Proving the dictum ‘no genuine search ends in vain’, the search into the oceans yield good results, and an array of new medicines (anti-biotics, anti-viral, anti-cancer, anti-malaria etc.) flow from the oceans.
Drugs of marine origin found a place in the ancient Siddha, Ayurveda Texts of India. They are mainly the shells found on the shores of the oceans and a few macroscopic marine organisms. The advanced technology in the field of oceanography paved the way for screening the marine wealth to the betterment of human welfare. The present study was aimed at bringing out the treasures hidden in the hands of traditional practitioners practising medicine in the remote rural places of Kanyakumari and Tirunelveli districts. A survey was made covering fifty traditional medical practitioners from these two districts. The questionnaire answered by the practitioners reveal the fact that drugs of marine sources are being constantly used for alleviating some of the diseases that afflict the humans. Most of these drugs are used as nutroceuticals, coming under the head CAM since they contain more minerals like Calcium, Iodine, Chlorides etc.

Of the many drugs the traditional practitioners talked about, only nine drugs were selected for observation. Most of these nine drugs found a place in the ancient texts also. The selected nine are amber, chank, coral, cowrie, fossil stone crab, pearl, pearl oyster, salt and turtle carapace. Out of this nine most of the traditional practitioners use three drugs mainly. The sales reports of the leading retail drug stores were also taken into account. Based on the volume of consumption, three drugs namely, Chank, Cowrie and Coral were short-listed and were subjected to pharmacological, anti-bacterial and qualitative analysis.

The pharmacological analysis of the three drugs proves the fact that the ancient drugs are time-tested, because they are being used even today effectively.
Chank (Sangu parpam) was tested for its analgesic and anti-ulcer action. Both the two actions are relevant even now. Cowrie (Palagarai parpam) was tested for its wound-healing and anti-pyretic actions. The result is that it can be used for healing wounds as an ointment and even for controlling fever. Likewise, the Coral (Pavala parpam) was tested for its analgesic, acute anti-inflammatory, Chronic anti-inflammatory and for its hypo-glycaemic action. In all the tests, pavala parpam stands to be effective in contrast to the standard modern drugs. The anti-bacterial tests of the three papams also proved that they got significant inhibitory action against pathogens. Since they are rich in Calcium, Sulphates, Chlorides, Carbonates, Zinc etc., they are found to be good mineral suppliers also. Today reverse pharmacology is gaining momentum. Screening the ancient drugs as told by the traditional practitioners or as found in the ancient texts, using the latest pharmacological, anti-microbial and biochemical analysis show that newer drugs would be added to the Indian Pharmacopoeia. Hence it is time to switch over the attention to the less explored ocean floor.

The commonly available shells found on the coastal areas and very commonly available medicinal plant species like Vitex negundo, Curculigo orchoides, Momordica charantia, Phyllanthus amarum, Euphorbia tircucalli and aquatic plants like Aponogeton natans, Pistia stratiotes are used to make the drugs at a very low cost to bring out the desired therapeutic results without imparting any side effects.