India is the second most populous country of the world and has changing socio-political demographic and morbidity patterns that have been drawing global attention in recent years. Despite several growth-orientated policies adopted by the government, the widening economic, regional and gender disparities are posing challenges for the health sector. About 75% of health infrastructure, medical manpower and other health resources are concentrated in urban areas where 27% of the population lives. Contagious, infectious and waterborne diseases such as diarrhoea, amoebiasis, typhoid, etc dominate the morbidity pattern, especially in rural areas. However, non-communicable diseases such as cancer, blindness, mental illness, hypertension, diabetes, HIV/AIDS, accidents and injuries are also on the rise. To improve the prevailing situation, the problem of rural health is to be addressed both at macro (national and state) and micro (district and regional) levels. This is to be done in a holistic way, with a genuine effort to bring the poorest of the population to the centre of the fiscal policies. A paradigm shift from the current ‘biomedical model’ to a ‘socio-cultural model’, which should bridge the gaps and improve quality of rural life, is the current need (Patil et al., 2002). This kind of approach should focus on general health and preventive medicine by considering the fact that if your body is clean with balanced nutrients, there is no chance for any kind of health problem.
Prevention is better than curing. The fields of preventive medicine and public health share the objectives of promoting general health, preventing specific diseases, and applying the concepts and techniques of epidemiology. The preventive medicine includes primary, secondary, and tertiary prevention levels. Katz and Ali (2009) explored the overlap and potential synergies of integrative medicine and preventive medicine in the context of these levels of prevention, acknowledging the relative deficiency of research on the effectiveness of practice-based integrative care. Preventive medicine encompasses both the care of individual patients, and public health practice, and as is evident in the name, focuses on the prevention of disease rather than treatment. Primary prevention keeps the disease process from becoming established by eliminating causes of disease or increasing resistance to disease. Secondary prevention interrupts the disease process before it becomes symptomatic. Tertiary prevention limits the physical and social consequences of symptomatic disease (Katz & Ali, 2009).

Integrative medicine, a term first introduced in the mid 1990s, now clearly gaining adherents and traction. The opportunity to combine the “best” of both conventional medicine and Complementary Alternative Medicine, and thereby produce better patient outcomes, measured in terms of symptom relief, functional status, patient satisfaction, and perhaps cost-effectiveness. Integrative medicine is necessarily “holistic” in the sense that somatic, emotional, and spiritual health are considered integral to overall health (Goldstein et al., 1988).
A number of Complementary Alternative Medicine systems, namely Traditional Chinese Medicine (Kaptchuk, 2000), Ayurveda (NCCAM, 2008; Chopra & Doiphode, 2002), and naturopathy (Hough et al., 2001; NCCAM, 2007) consider dietary habits and therapeutic nutrition as a cornerstone of health. Many of their recommendations are consistent with current mainstream dietary recommendations for chronic disease prevention; though some traditional recommendations conflict. Nevertheless, the emphasis of food as a primary basis of health conforms well to the objectives of primary prevention. Certain lifestyle aspects, namely digestive function and sleep, both impact risk of acute and chronic disease and are generally more emphasized by integrative and CAM practitioners than conventional primary care providers (Hough et al., 2001; Weil, 2000). The consumption of dietary fiber is associated with reductions in risk for cardiovascular disease (Retelny et al., 2008), certain cancers (Anand et al., 2008), reduced body weight (van Dam and Seidell, 2007), and lower all-cause mortality (Papanikolaou and Fulgoni, 2008). Dietary fiber consumption is also associated with reduced intestinal transit time (Hillemeier, 1995) and improved bowel function. This is synonymous with “digestive health” that is emphasized in a number of CAM systems, including Ayurveda (Chopra and Doiphode, 2002; NCCAM, 2008), naturopathy (Hough et al., 2001; NCCAM, 2007), and traditional Chinese medicine (Kaptchuk, 2000).
It is commonly understood that pure medicines for particular disease always cause at least symptomless side effects which can be prevented only by alternative medicine, particularly by diet therapy. Thus pure medicine without alternative medicine will not be successful one.

In the meantime the government takes efforts to prevent various diseases by implementing different projects like vaccination and conducting awareness camps in relation several fatal diseases. Primary prevention keeps the disease process from becoming established by eliminating causes of disease or by increasing resistance to disease. Health promotion through promotion of healthy lifestyle, nutrition, and environment is emphasized (Jekel et al., 2007). Katz and Ali (2009) have clearly suggested that research must be increased on the ability to assist in and adhere to lifestyle change in patients utilizing integrative medicine; research should compare differing models of integrative care in terms of optimizing outcomes and cost, as well as comparing integrative medicine models with standard care; clinical trials of integrative medicine should be conducted on outcomes with high public health significance and exposure to integrative practice should be routine in medical education. Secondary prevention interrupts the disease process before it becomes symptomatic. Screening, case finding, and appropriate treatment are secondary prevention interventions (Jekel et al., 2007).
Department of AUSH, Ministry of health and family welfare, Government of India, defines naturopathy as ‘a system of man building in harmony with the constructive principles of Nature on physical, mental, moral and spiritual planes of living. It has great health-promotive, disease preventive and curative as well as restorative potential’. According to the manifesto of British Naturopathic Association, "Naturopathy is a system of treatment which recognises the existence of the vital curative force within the body." It therefore, advocates aiding human system to remove the cause of disease i.e. toxins by expelling the unwanted and unused matters from human body for curing diseases. Indian Naturopathy movement started mainly in the States of Andhra Pradesh, Uttar Pradesh, Bengal, Maharashtra and Gujarat.

According to AYUSH, Government of India, the main features of Naturopathy are as under:

- All diseases, their causes and treatment are one. Except for traumatic and environmental conditions, the cause of all diseases is one i.e. accumulation of morbid matter in the body. The treatment of all diseases is elimination of morbid matter from the body.

- The primary cause of disease is accumulation of morbid matter. Bacteria and virus enter and survive in the body only after the accumulation of morbid matter when a favourable atmosphere for their growth is established in body.
Acute diseases are self-healing efforts of the body. Hence, they are our friends, not the enemy. Chronic diseases are outcome of wrong treatment and suppression of the acute diseases.

Nature is the greatest healer. The human body itself has the healing power to prevent itself from disease and regain health if unhealthy.

In Nature Cure it is not the disease but the entire body of the patient which is caused and is renewed.

Naturopathy Cures Patients suffering from chronic ailments are also treated successfully in comparatively less time by Naturopathy.

In Nature Cure the suppressed diseases are brought to surface and are removed permanently.

Naturopathy treats all the aspects like physical, mental, social and spiritual at the same time.

Naturopathy treats the body as a whole.

According to Naturopathy, “Food is only the Medicine”, no external medications are used.

Performing prayer according to one’s spiritual faith is an important part of treatment.
Naturopathy is an art and science of healthy living and a drugless system of healing based on well founded philosophy. It has its own concept of health and disease and also principle of treatment. Naturopathy is a very old science. We can find a number of references in our Vedas and other ancient texts. The morbid matter theory, concept of vital force and other concepts upon which Naturopathy is based are already available in old texts. The revival of Naturopathy started in India by translation of Germany’s Louis Kuhne’s book “New Science of Healing”. Shri D. Venkat Chelapati Sharma translated this book in Telgu language in 1894. Shri Shroti Kishan Swaroop of Bijnor translated this book into Hindi and Urdu languages in 1904. All this gave a wide propagation to this system.

There are several State Boards of Indian Medicine with several naturopaths. According to AYUSH, up to 23rd of September, 2010, there are 800 naturopaths in Board of Indian Medicine, Secunderabad, Govt. of A. P., 340 in Karnataka Ayurveda, Unani & Naturopathy Practitioners Board, Bangalore, Govt. of Karnataka, 670 in Tamil Nadu Board of Indian Medicine, Chennai, Govt. of Tamil Nadu and 18 in M. P. Ayurveda, Unani, Prakritik Chikitsa Board, Bhopal. Govt. of MP.

To check the possibilities and limitations of naturopathic treatment in inpatient care, a department of naturopathy was set up as a model project at the Hospital Blankenstein, Hattingen, in January 1997. The study comprised 618 patients of the department of naturopathy who were treated for rheumatic diseases, metabolic diseases, chronic bronchial diseases and allergic complaints between July 1, 1999 and June 13, 1999. The average age was 57.3 years and the median was 58 years. 71.3% of the patients were of gainful employment age, i.e. between 17 and 65 years old. The therapy consisted of serial treatments with classical naturopathic methods (hydrotherapy, phytotherapy etc.) adapted to the patients' individual needs. The aim parameter was the quality of life of the patient, measured by SF-36 and HLQ. It is of special importance of naturopathy, as the temporal dimension of treatment is important in this context, and as it is often asserted that a manifestation of a therapeutical success is obvious mainly on a long-term basis (Beer et al., 2001).
In naturopathy, numerous diet formulas and herbal medicines are used to treat numerous diseases. On one side with the aim to discover pure medicine for particular pharmacological property from particular herb, numerous pharmacological studies are being carried out on numerous medicinal plants. But the percentage of successful pure medicines in the market is very low mainly due to the side effects or nil effect of the drug in vivo. It clearly reflects the mixture of chemicals in a herb with synergistic effect. Although numerous pharmacological studies carried out to discover pure medicine is not up to the level of expected success, all such pharmacological evidences mainly support the basic principles of naturopathy. Since, for a long time, naturopathic practitioners use very common food items and common herbs, modern pharmacological evidences are available for almost on all such food items and herbs. Since it is of vast area it is not possible to review separately with few pages, a brief account on particular disease of the present survey, causes and modern approach of treating such disease and naturopathy practice as in the present survey along with justification of such foods / herbs based on modern studies have been given under result and discussion.
MATERIALS AND METHODS

Study Area:

The megabiodiversity country India in general is not only endowed with rich biodiversity, but also with several kinds of traditional medical practices. Collection of ethnobotanical information from tribals is a common practice of ethnobotanists. But, naturopathy, particularly dietary therapy is of a special kind of traditional medical practice which is practiced by several naturopaths in Tamil Nadu. Naturopathy played a major role in Tamil Nadu, especially in southern districts, and gained a new approach for the treatment of various chronic diseases successfully. In the present study, exploration and documentation on Traditional Naturopathic Practices were carried out in the southern districts of Tamil Nadu such as Kanyakumari, Tirunelveli, Tuticorin and Virudhu Nagar.

Traditional Naturopathy Practitioners:

Traditional Naturopathy Practitioners, who have registered in the “Tamil Nadu Traditional Naturopathic Association” and practicing as fulltime service for many years in the study area were identified. Totally 24 Traditional Naturopathy Practitioners, 9 from Tirunelveli district, 5 from Tuticorin district, 3 from Kanyakumari district and 7 from Virudhu Nagar district, were identified (Plate I-III). The present study is mainly aimed to document the unwritten knowledge of naturopathy from the selected traditional naturopathy practitioners.
**Interview with diabetic (Type 2) patients:**

Unlike, in other system of medical practice, the success of naturopathy depends upon the cooperation of both the practitioner and the patient. So it will not be useful and complete, if such traditional naturopathy practices are documented from the practitioners only. The practitioners know about the success of their practices based on the patients and the patients may know very well about the successfulness and weakness, if any, of the naturopathy. So it has been aimed to collect feedback from the patients also. Since it is of broad and difficult task, it has been aimed to get feedback from patients of diabetes only, since it is a more complicated, troublesome and diet-style-dependent serious health problem among the people of Tamil Nadu. Only type 2 diabetic- treated patients by the Traditional Naturopathic Practitioners with stable medical condition without any other serious ailments were chosen for this study. The contact details about the treated patients were collected from the Practitioners. Totally 40 diabetic patients, 21 from Tirunelveli district, 5 from Tutucorin district, 8 from Kanyakumari district and 6 from Virudhu Nagar district, were selected. Patients selected for the study were adult, either male or female, of any ethnic group, with stable medical condition and were able to perform daily activities independently. Patients with alcohol or drug addiction were not included.
Interviews:

The interviews and field observations were carried out in the study area according to the method of Heinrich et al., (2009). The fieldwork was conducted from 2006 to 2009. The interview was focused on both Traditional Naturopathic Practitioners and patients with type 2 diabetes. The purpose and nature of the study was described to them in a simple language to obtain their prior consent. Totally 24 traditional naturopathic practitioners were interviewed (Plat I & II) by using the Food Frequency Questionnaire (FFQ), while 40 diabetic (Type-2) naturopathy-treated patients were interviewed by using 24-hour Dietary Recall Questionnaire (Annexure I & II).

Food Frequency Questionnaire:

Initially food list was prepared, based on the data obtained from the Tamil Nadu Agricultural University, along with supplementary food items practiced by local dieticians and traditional medical practitioners. Totally 142 locally available food items (cereals and its products, condiments and spices, fruits and vegetables, leafy vegetables, medicinal herbs, nuts and oil seeds, pulses and legumes) were selected. The FFQ was prepared by following the modified methods of Keleman et al. (2003) consisting two parts: first part deals with the demographic profile while the second part deals with details about food items such as local name of the plant, parts used, method of preparation of drugs, mode of administration, treated diseases with symptoms and duration of the treatment.
**24-hour Dietary Recall:**

24-hour Dietary Recall Questionnaire was prepared by using the standard method of Thomson and Subar (2008) consisting of two parts. The first part dealt with the demographic profile of the informants such as name, age, sex, education and occupation. The second part dealt with food items consumed as per practitioner’s advice. In this, the informants were asked to describe treatment followed prior to naturopathy, diabetic symptoms, duration of therapy advised, time deviation if any, status of prescription followed after treatment and restrictions followed. Blood sugar level, average of three months report before and after treatment, of each patient was also considered for authentification.

**Method of presentation of results:**

The data collected from naturopathy practitioners were segregated disease wise and the food items were segregated for each disease. Detail about diet schedule has been given for each and every disease. Based on the general data, the top ten species for each and every disease were identified and listed under respective disease. In the case of diabetes, in order to find out the relationships between the success of naturopathy in controlling diabetes, the non dietary and dietary factors and other medicinal herbs has been compared graphically.
RESULTS AND DISCUSSION

It is well understood that changes in life style, particularly in diet, is the major reason for the development of any disease. When viewed from the perspective of primate life on earth, eating cooked food is a relatively new innovation that had inadvertently introduced certain new stress factors. It had been pointed out cooking might partially or fully removes the natural and inherent protective mechanism that could be harnessed through diet (Douglass, 1975; Douglass, 1976; Walters, 1957). Processed foods constitute a loss of possible antigens (Davies et al., 1974). Several explanations have been proposed for the benefits attributed to many plant-based dietary patterns which give protection against several chronic diseases (Haddad et al. 2003; Sinha, 2002). Apart from edible food items, the role of herbs in health care is so indispensable for ages in all forms of cultural groups and ethnic tribes around the world.

In this modern world with such a drastic shift towards refined/fast foods from ancient natural foods, only the professional naturopathic dietary life style is trying to reestablish the valuable lost-culture. Today when compared to allopathic medicinal system naturopathic system of rare occurrence without any written documents which are yet to be compiled. The present study is with the aim to compile such valuable documents of naturopathic practitioners from Southern districts of Tamil Nadu with particular reference to chronic diseases. Taxonomic details (Plate IV) along with use of different kinds of food items (fruits, vegetables, nuts, whole grains) and different medicinal herbs for treating 29 selected chronic diseases (Table 1, 2, Plate V) in southern districts of Tamil Nadu have been documented during field survey and presented in this thesis.
1. FEVER

Thermoregulation, one aspect of homeostasis, is the ability of an organism to keep its body temperature within certain boundaries, even when the surrounding temperature is very different. When the body is not able to operate thermoregulation, it will result in an increase in body temperature and such condition of health is called fever which is a complex physiologic response triggered by infectious or aseptic stimuli. The human body has a normal core temperature of 37.0 degrees centigrade or 98.6 degrees fahrenheit. Any variation in this core figure implies that something is amiss. Fever is a protective mechanism of the body-the body's response to tissue injury.

There are different types of fever based on the causal agent / causal factors such as: Influenza, Malaria, Typhoid Fever, Measles, Chicken Pox, Rheumatic Fever, Meningitis, Dengue fever etc. Dengue fever also known as break bone fever is an infectious tropical disease caused by the dengue virus. Symptoms include fever, headache, muscle and joint pains, and a characteristic skin rash that is similar to measles. In a small proportion of cases the disease develops into the life-threatening dengue hemorrhagic fever, resulting in bleeding, low levels of blood platelets and blood plasma leakage, or into dengue shock syndrome, where dangerously low blood pressure occurs. Dengue is transmitted by several species of mosquito within the genus *Aedes*, principally *A. aegypti*. 
Prostaglandin acts on thermoregulatory center of hypothalamus to produce fever. Elevations in body temperature occur when concentrations of prostaglandin E2 (PGE2) increase within certain areas of the brain. These elevations alter the firing rate of neurons that control thermoregulation in the hypothalamus. Antipyretics are drugs or herbs that reduce fever. Normally, they will not lower body temperature in case one has a high fever. Antipyretics cause the hypothalamus to override an interleukin-induced increase in temperature. The body then works to lower the temperature, resulting in a reduction in fever. The most common antipyretics are aspirin, antipyrine, phenacetin, and paracetamol. Therapies involving the combination of acetaminophen and aspirin, or alternating doses of acetaminophen and ibuprofen have shown somewhat greater antipyretic effect than acetaminophen alone (Sarrell et al., 2006). Bathing or sponging with lukewarm or cool water can effectively reduce body temperature in those with heat illness but not usually fever.

It is now clear that most antipyretics work by inhibiting the enzyme cyclooxygenase and reducing the levels of PGE(2) within the hypothalamus. Recently, other mechanisms of action for antipyretic drugs have been suggested, including their ability to reduce proinflammatory mediators, enhance anti-inflammatory signals at sites of injury, or boost antipyretic messages within the brain (Arnoff & Neilson, 2001). Inhibitors of alternative pathways of arachidonate metabolism differentially affect fever in mice (Kozak et al., 1998). Kozak et al., (2000) reviewed recent studies on endogenous antipyretic mechanisms. Fever is
the result of a balance between pyrogenic and cryogenic cytokines and hormones. Many endogenous cryogens or antipyretics that limit the rise in body temperature have been identified during the last 25 years. These include alpha-MSH, arginine vasopressin, glucocorticoids, TNF (under certain circumstances), and IL-10. Most recently, evidence has accumulated that cytochrome P-450 (P-450), part of the alternative pathway for arachidonic acid metabolism, plays an important role in reduction of fever and inflammation.

Traditional use of higher plants with antipyretic properties is a common worldwide feature of many ethnobotanical cultural systems (Khattak et al., 1985). In ethnobotany, plants with naturally occurring antipyretic properties are commonly referred to as febrifuges (Schultes et al., 1994). In the present study 11 species (Table 3) *Cassia auriculata, Centella asiatica, Citrus aurantium, Citrus limon, Garcinia mangostena, Malus sylvestris, Mollugo nudicaulis, Musa paradisiaca, Punica granatum, Vitis vinifera* and *Ziziphus jujuba* are used for the treatment of fever. *Mollugo nudicaulis* is an ethnomedicinally used to treat fever (Nandagopalan et al., 2011). Umashanker and Shruti (2011) have listed thirty five herbs with antipyretic effect including *Centella asiatica* of the present study. Flowers and leaf extract of *Cassia auriculata* of the present study also show antipyretic effect (Vedavathy & Rao, 1991).
It should be remembered that fever is a common symptom of several disorders of the body, it is important to find out the root cause which should ultimately be cured. Fever may be caused by infections, mechanical trauma, anemia, heart attack, stroke, hemorrhage, certain metabolic disorders, arthritic conditions, drug reaction, immune dysfunction or cancer. In fact, anything wrong with the body will trigger this reaction, initiated in a centre located in the hypothalamic region of the brain, called the thermo-regulatory centre. Essentially, fever is a protective mechanism of the body and is actually the beginning of the healing process, carried out by the body's defence mechanisms, rather than a symptom. It helps mobilise the white blood cells of the blood, to actually destroy the invader, and either engulf and ingest it or carry away the debris of destruction, for removal by the kidney.

It has also been proved experimentally that, fever is an integrated response of the central nervous system to oxidative stress (Riedel & Maulik, 1999). The causative / regulatory connections between changes in tissue redox state and fever induction have been investigated by Hou et al., (2011). An association between viral diseases and increased oxidative stress has been suggested. Oxidative stress is generated during the progress of typhoid fever (Bayim et al., 2012). *Terminalia chebula* Reduces the Oxidative stress induced by *Salmonella typhimurium* in Mice and may reduce the risk of getting typhoid (Khan, 2009). Gil et al. (2004) suggested that the alteration in redox status could result of increased oxidative stress and it may play a role in the pathogenesis of the disease. Their study
suggests the relationship of *in vivo* oxidative stress, as indicated by high levels of sensitive markers of lipid peroxidation, with the pathogenesis of dengue virus infection. Lipid peroxidation levels and endothelial cell dysfunction could be related and would acutely enhance local or systemic vascular leakage. Another study carried out in Vector Control Research Centre, Pondicherry, India, explained that the level of oxidative stress was maximal in Dengue Shock Syndrome, followed by Dengue Hemorrhagic Fever, and its severity was minimal in Dengue Fever. The thrombocytopenia of dengue infection was associated with the extent of lipid peroxidation (Soundaravally *et al.*, 2008). The naturopathic treatment of various fevers is by reducing the oxidative stress by using antioxidants from various fruits and herbs along with some antipyretic herbs as mentioned in the table 3. Fruits of *Punica granatum* of the present study with high phenolic content is widely used as an antipyretic / analgesic in Chinese culture (Lee *et al.*, 2010).

In naturopathic point of view, generally fever is nothing but a kind of healing crisis to remove morbid matter from the body in the form of heat. Suppression of fever by using drugs may lead to other harmful effects. Hence it is imperative to help the body to remove such toxic morbid matters by consuming natural antioxidants from fruits, vegetables and other herbs.
2. HEADACHE

A headache or cephalalgia is pain anywhere in the region of the head or neck. It can be a symptom of a number of different conditions of the head and neck. The brain tissue itself is not sensitive to pain because it lacks pain receptors. Rather, the pain is caused by disturbance of the pain-sensitive structures around the brain. Nine areas of the head and neck have these pain-sensitive structures, which are the cranium (the periosteum of the skull), muscles, nerves, arteries and veins, subcutaneous tissues, eyes, ears, sinuses and mucous membranes. Headache is a non-specific symptom, which means that it has many possible causes. Treatment of a headache depends on the underlying etiology or cause, but commonly involves analgesics.

There are over 200 types of headache, and the causes range from harmless to life-threatening. The most common types of headache are the "primary headache disorders", such as tension-type headache and migraine. They have typical features; migraine, for example, tends to be pulsating in character, affecting one side of the head, associated with nausea, disabling in severity, and usually lasts between 3 hours and 3 days. Headaches may be caused by problems elsewhere in the head or neck. Some of these are not harmful.

There are several reports on traditional use along with pharmacological evidences on herbs with analgesic activities.
In the present survey, the following fruits and vegetables along with piper and rice are used to cure headache: *Carica papaya*, *Citrus aurantium*, *Citrus limon*, *Cocos nucifera*, *Cucumis sativus*, *Cynodon dactylon*, *Daucus carota*, *Cucurbita pepo*, *Lycopersicon esculentum*, *Murraya koenigii*, *Musa paradisiaca*, *Oryza sativa*, *Phoenix dactylifera*, *Piper nigrum*, *Punica granatum*, *Sechium edule*, *Trichosanthes anguiana* and *Vitis vinifera* (Table 4).

The ketogenic diet is a treatment paradigm for diverse neurological disorders (Stafstrom & Rho, 2012). Almeida *et al.*, (2001) have made a global review on plant analgesic activity with special emphasis on those found in different parts of the world, including Brazil, which act on the central nervous system. One hundred and sixty six plants belonging to 79 families are reported. Analgesic from the family of the non-steroidal anti-inflammatory drugs (NSAIDs) have probably been used for more than 2000 years. The currently available analgesic and antipyretic drugs in allopathic system of medicine are not so effective in combating wide variety of complications. The remedial measure may lie in the ayurvedic system of medicine. The various herbal drugs such as *Acacia nilotica*, *Bauhinia racemosa*, *Cleome viscosa*, *Hippobromus panciflorus* etc are known for their potential analgesic and antipyretic activities. The various branded herbal formulations like Rumalaya, Charak, Rumartho, Arthrella, and Reosto etc are available in the market as analgesic and antipyretic remedies (Singh *et al.*, 2010).
Analgesic effect of essential oil from *Carum copticum* (Hejazian, 2006), analgesic and anti-inflammatory activities in essential oils of *Eucalyptus* (Silva *et al*., 2003), in *Diospyros cordifolia* (Das *et al*., 2011) and anti-edematogenic and analgesic activities in *Ficus benghalensis* (Mahajan *et al*., 2012) have also been reported. The *Cucumis sativus* fruit of the present study is reported to have maximum antioxidant and analgesic effect at 500 μg/ml and 500 mg/kg, respectively (Kumar *et al*., 2010). The analgesic activity of the aqueous extract of *Viola odorata* showed a significant effect in the peripheral and central models of pain (tail immersion and hot plate method) while *n*-hexane and butanolic extracts did not show any significant effect (Antil *et al*., 2011).

Hesperidin, an important flavanone of *Citrus* sp. Hesperidin obtained from the solid residue of orange peel after acidic pretreatment showed significant anti-inflammatory and analgesic effects (Galati *et al*., 1994). The *Citrus decumana* peel extract with antioxidant, anti-inflammatory and analgesic potential may be useful as a natural antioxidant in the treatment of inflammation and pain (Sood *et al*., 2009). In the present survey *Citrus* species has been included as a major diet component to cure head ache. *Punica granatum* flowers also show analgesic activity (Chakraborty, 2008).
Essential oils like Eucalyptus oil are used as analgesic agent. It is well known that the essential oils consist mainly of monoterpenes. Recently, Guimaraes et al. (2012) have given an elaborate account on the analgesic activity with mechanism of action of various kinds of monoterpenes.

In general, patients who suffer from headaches must pay very close attention to their diets. Most of these patients suffer from excessive levels of free fatty acids in their brains. Therefore they need to avoid things like fried foods, food additives, neurotoxic agents (aspartame, nitrates, nitrites) they may also suffer from low blood sugar problems. Low blood sugar will affect brain chemistry as glucose is the major fuel for the brain. Therefore, low blood sugar is one of the primary culprits involved in headaches. However, high blood sugar can also contribute to headaches as high sugar levels will activate the parasympathetic nervous system, causing the blood vessels feeding the brain to over dilate. Many headache drugs actually work by constricting the blood vessels to the brains (http://mdwellnessmd.com/headaches/). In the present study also the diet mainly includes only fruits and vegetables, many of which acts directly as analgesic agents and they also indirectly act as antioxidants and anti-inflammatory agents.
3. GAS TROUBLE

The National Digestive Diseases Information Clearinghouse (NDDIC) is part of the National Institutes of Health of the US Department of Health and Human Services, established in 1980 (http://digestive.niddk.nih.gov/ddiseases/pubs/gas/). The following information is given by this department.

Everyone has gas and eliminates it by burping or passing it through the rectum. However, many people think they have too much gas when they really have normal amounts. Most people produce about 1 to 4 pints a day and pass gas about 14 times a day. Gas is made primarily of odorless vapors—carbon dioxide, oxygen, nitrogen, hydrogen, and sometimes methane. The unpleasant odor of flatulence, the gas that passes through the rectum, comes from bacteria in the large intestine that release small amounts of gases containing sulfur. Although having gas is common, it can be uncomfortable and embarrassing. Understanding causes, ways to reduce symptoms and treatment will help most people find relief.

Gas in the digestive tract comes from two sources: swallowed air and normal breakdown of certain undigested foods by harmless bacteria naturally present in the large intestine. Aerophagia, or air swallowing, is a common cause of gas in the stomach. The stomach also releases carbon dioxide when stomach acid mixes with the bicarbonate in digestive juices, but most of this gas is absorbed into the bloodstream and does not enter the large intestine.
Breakdown of Undigested Foods and formation of gases:

The body does not digest and absorb some carbohydrates—the sugar, starches, and fiber found in many foods—in the small intestine because of a shortage or absence of certain enzymes that aid digestion. This undigested food then passes from the small intestine into the large intestine, where normal, harmless bacteria break down the food, producing hydrogen, carbon dioxide, and, in about one-third of all people, methane. Eventually these gases exit through the rectum. People who make methane do not necessarily pass more gas or have unique symptoms. Some common bacteria in the large intestine can destroy the hydrogen that other bacteria produce. The balance of the two types of bacteria may explain why some people have more gas than others.

Most foods that contain carbohydrates can cause gas. By contrast, fats and proteins cause little gas. The sugars that cause gas are raffinose, lactose, fructose, and sorbitol. Beans contain large amounts of this complex sugar raffinose. Smaller amounts are found in cabbage, brussels sprouts, broccoli, asparagus, other vegetables, and whole grains. Lactose is the natural sugar in milk. It is also found in milk products, such as cheese and ice cream, and processed foods, such as bread, cereal, and salad dressing. Many people, particularly those of African, Native American, or Asian background, normally have low levels of lactase, the enzyme needed to digest lactose, after childhood. Also, as people age, their enzyme levels decrease. As a result, over time people may experience increasing amounts of gas after eating food containing lactose. Fructose is naturally present
in onions, artichokes, pears, and wheat. It is also used as a sweetener in some soft drinks and fruit drinks. Sorbitol is a sugar found naturally in fruits, including apples, pears, peaches, and prunes. It is also used as an artificial sweetener in many dietetic foods and sugar-free candies and gums. Most starches, including potatoes, corn, pasta, and wheat, produce gas as they are broken down in the large intestine. Rice is the only starch that does not cause gas.

Many foods contain soluble and insoluble fiber. Soluble fiber dissolves easily in water and takes on a soft, gel-like texture in the intestines. Found in oat bran, beans, peas, and most fruits, soluble fiber is not broken down until it reaches the large intestine, where digestion causes gas. Insoluble fiber, on the other hand, passes essentially unchanged through the intestines and produces little gas. Wheat bran and some vegetables contain this kind of fiber.

The most common symptoms of gas are flatulence, abdominal bloating, abdominal pain, and belching. However, not everyone experiences these symptoms. The type and degree of symptoms probably depends on how much gas the body produces, how many fatty acids the body absorbs, and a person's sensitivity to gas in the large intestine. These kind of gas problems can easily be avoided by proper diet style for permanent solution and by using several herbs the problems are temporarily cured.
Although gas may be uncomfortable and embarrassing, it is not life threatening. Understanding causes, ways to reduce symptoms and treatment will help most people find some relief. Everyone has gas in the digestive tract. People often believe normal passage of gas to be excessive.

In the present study, *Anana comosus, Carica papaya, Citrus aurantium, Citrus limon, Cocos nucifera, Cucumis sativus, Cynodon dactylon, Daucus carota, Cucurbita pepo, Lycopersicon esculentum, Malus sylvestris, Mangifera indica, Murraya koenigii, Musa paradisiaca, Oryza sativa, Phoenix dactylifera, Piper nigrum, Trichosanthes anguiana and Vitis vinifera* (Table 5) are used in the diet schedule to treat and avoid gas troubles.

Oxygen radicals derived from platelet-activating factor, activated granulocytes induce oxidative stress, and that oxidative changes are actually implicated in the pathogenesis of gastric mucosal injury (Fukumura *et al.*, 1995). Recently Wang *et al.*, (2011) concluded that Reactive Oxygen Species can regulate HIF-1α expression in gastric ischemia. The present diet schedule with several antioxidant agents and easily digestible diets may help in preventing gas troubles.
4. PILES

Haemorrhoids are vascular structures in the anal canal which help with stool control (Schubert et al., 2009). They become pathological or piles (Lorenzo-Rivero, 2009) when swollen or inflamed. In their physiological state, they act as a cushion composed of arterio-venous channels and connective tissue that aid the passage of stool. The symptoms of pathological hemorrhoids depend on the type present. Internal hemorrhoids usually present with painless rectal bleeding while external hemorrhoids present with pain in the area of the anus. Recommended treatment consists of increasing fiber intake, oral fluids to maintain hydration, NSAID analgesics, sitz baths, and rest. Surgery is reserved for those who fail to improve following these measures. A number of factors may lead to the formations of hemorrhoids including irregular bowel habits (constipation or diarrhea), exercise, nutrition (low-fiber diet), increased intra-abdominal pressure (prolonged straining), pregnancy, genetics, absence of valves within the hemorrhoidal veins, and aging (Lorenzo-Rivero, 2009). Other factors such as obesity and sitting for long periods of time may also results in hemorrhoids. The best way to prevent hemorrhoids is to keep stools soft so they pass easily, thus decreasing pressure and straining, and to empty bowels as soon as possible after the urge occurs. Exercise, including walking, and increased fiber in the diet help reduce constipation and straining by producing stools that are softer and easier to pass. Spending less time attempting to defecate and avoiding reading while on the toilet have been recommended (Lorenzo-Rivero, 2009).
Pushpangadan et al., (2007) invented a novel herbal formulation for use in treatment of piles. Formulation(s) comprises of leaves of *Moringa oliefera*, tender leaves of *Pongamia pinnata*, whole plant of *Cassia occidentalis* and leaves of *Albizia lebbeck*. The formulation can be used as an emulsion or as a soft gelatin capsule for oral dosage forms or in the form of ointment. Naringenin appears to be a novel alternative treatment strategy for constipation. Naringenin could stimulate Cl-secretion in colonic epithelium via a signaling pathway involving cAMP and PKA, hence provide an osmotic force for subsequent colonic fluid secretion by which the laxative effect observed in the rat constipation model (Yang et al., 2008). Lactulose is an effective laxative that affects the character of the colonic fecal content, thereby inducing evacuation of feces in people with constipation (Bass & Dennis, 1981).

The diet schedule to treat piles problem has been given in table 6. Top 10 species used for the treatment of Piles, are *Musa paradisiaca*, *Carica papaya*, *Cucumis sativus*, *Ficus carica*, *Citrus aurantium*, *Citrus limon*, *Cocos nucifera*, *Cucumis melo* and *Psidium guajava*. Fruits of *Aegle marmelos* of the present study is an Ayurvedic drug to cure variety of disorders including hemorrhoids and constipation (Sharma et al., 2011) *Eugenia dysenterica* fruits could be utilized in the development of novel biotechnological pharmaceutics with laxative properties for use in chronic constipation and irritable bowel syndrome treatment (Lima et al., 2010).
5. ACID PEPTIC DISEASE (APD)

“Acid peptic disease” is a collective term used to include many conditions such as gastro-esophageal reflux disease (GERD), gastritis, gastric ulcer, duodenal ulcer, esophageal ulcer, Zollinger Ellison Syndrome (ZES) and Meckel’s diverticular ulcer. Excessive secretion of the acid and pepsin or a weakened stomach mucosal defense is responsible for damage to the delicate mucosa and the lining of the stomach, esophagus and duodenum resulting in ulceration which is known as “Acid Peptic Disease”. Literally speaking acid peptic pertains to: Acid: – A substance which when dissolved in a solvent releases hydrogen ions (H+). In this particular case it is about the hydrochloric acid, which is produced, in our stomach. Peptic: – That which promotes or helps digestion. Acid peptic diseases result in digestive abnormalities. A natural healing diet provides the right balance of carbohydrates, fats, proteins, vitamins, mineral and water. A change in life style also helps to reduce the risk of acid peptic disorders.

Umashanker and Shruti (2011) have listed nineteen antiulcer herbs used in Indian-Traditional medicinal system. A variety of botanical products have been reported to possess antiulcer activity with muco-protective activity and gastric anti-secretary when compared with that of reference herbal drugs. The extract is non-toxic even at relatively high concentrations. The antiulcer activity is probably due to the presence of flavonoids and tannins in herbal plants. The extracts of leaves of several plants have good potentials for use in peptic ulcer disease

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(Sravani et al., 2011). The flavonoid ‘Catechins’ acts as an antiulcer agent by inhibiting the H+/K ATPase (Shohaib et al., 2011).

In the 1970s, the identification of the histamine H2-receptor by Black and the subsequent development of histamine H2-receptor antagonists revolutionized our understanding and treatment of acid / peptic disorders. More recently, the identification of hydrogen-potassium-stimulated adenosine triphosphatase (H+/K(+)-ATPase) as the proton pump of the parietal cell and the recognition of the prominent role of *Helicobacter pylori* in the pathogenesis of duodenal and gastric ulceration have heralded a new revolution in our understanding and treatment of these disorders. Substituted benzimidazole compounds (omeprazole, lansoprazole and pantoprazole) that covalently bind to and inactivate the proton pump allow complete and prolonged inhibition of acid secretion. Eradication of *H. pylori* with antibiotics offers, for the first time, a permanent cure for most duodenal and many gastric ulcers (Schubert, 1996).

In the present study (Table 7), the top 10 plants species used for the treatment of Acid Peptic Disease are *Musa paradisiaca, Cocos nucifera, Aegle marmelos, Benincasa hispida, Citrus aurantium, Cucumis limon, Daucus carota, Cucurbita pepo, Lycopersicon esculentum* and *Murraya koenigii*. Presence of antiulcer property and antiulcer agents, flavonoids, has been reported in several plants which are being used in naturopathy. Imam and Akter (2011) have given an elaborative account on phytochemical and pharmacological details about *Musa paradisiaca* and *M. sapientum* which are traditionally use to cure several diseases.
including intestinal lesions in ulcerative colitis (Khare, 2007). Several flavonoids and related compounds are present in unripe pulp of plantain (Lewis et al., 1999). *M. paradisiaca* leaves are also found to be useful as a natural antiulcer as well as a gastric antioxidant agents by decreasing gastric content, total acidity, ulcer index, and increase in pH (Raghu et al., 2012). The anti-ulcer flavonoid leucocyanidin, has been isolated from *Musa sapientum* L. var. *paradisiaca* (Lewis et al., 1999).

In the present study, the dominant botanical family of naturopathic medicines for Peptic Ulcer is Cucurbitaceae (with two species among top ten species), from which several kinds of flavonoids such as isovitexin, isoorientin, saponarin, and saponarin 4’-O-glucoside in fruits of *Cucurbita pepo* (Mirlosawa and Cisowski (1995). Flavoids (isoquercitrin, kaempferol), β sitosterol, campesterol and oleanolic acid are also present in cucurbits and they may account at least in part for their application in folk medicine (Gangwal et al., 2010). Prajapati et al., (2010) have reviewed the phytochemical and pharmacological, including antiulcer, properties of *Cucurbita pepo*. Several kinds of flavonoids and their glycosides have been reported from the leaves of *Cucumis sativus* (Krauze-Baranowska & Cisowski, 2001; Abou-Zaid et al., 2001).

*Benincasa hispida* (Bhuru kolu) of the present study is said to contain the active constituents like flavonol, steroids, triterpenes, flavones, beta- sitosterol.
Fruits of this plant are traditionally used as a laxative, diuretic, ulcers, tonic, aphrodisiac, cardiotonic, urinary calculi, insanity, epilepsy, and also in case of jaundice, fever, menstrual disorders (Rachchh & Jain, 2008). Gastroprotective effects of Benincasa hispida - fruits and Cucumis melo - seeds has been experimentally proved by Grover et al. (2001) and Gill et al. (2011) respectively. Anti-ulcerogenic and in vitro antioxidant activities have also been confirmed in Lagenaria brevilora fruits (Onasanwo et al., 2011) with laboratory animals.

Since Acid Peptic Diseases are associated with the infection by the bacterium Helicobacter pylori, it should be controlled along with the efforts to reduce the acidity. It has been demonstrated that the essential oils are bactericidal against H. pylori. Thirteen essential oils completely inhibited the growth of H. pylori in vitro at a concentration of 0.1% (v/v). Cymbopogon citratus (lemongrass) and Lippia citriodora (lemon verbena) were bactericidal against H. pylori at 0.01% at pH 4.0 and 5.0. In in vivo studies, the density of H. pylori in the stomach of mice treated with lemongrass was significantly reduced compared with untreated mice (Ohno et al., 2003). Extracts of Curcuma longa and Kaemferia parviflora exhibited significant anti- H. pylori activities at minimum inhibitory concentration (MIC) of 32 and 64 μg/ml, respectively. In some other studies the extracts from C. longa, Musa sapientum, grape extract showed inhibitory effects on the internalization of H. pylori to HEp-2 cells at 3 h of treatment (Brown et al., 2009; Chaichanawongsaroj et al., 2012). In ligation
induced gastric ulcer, *Murraya Koenigii* extract showed significant reduction in ulcer index, free acidity, total acidity and gastric volume but raised pH of gastric juice as compared to the control groups (Patidar, 2011).

Coconut milk and water show protective effects on the ulcerated gastric mucosa. Coconut milk offered stronger protection on indomethacin-induced ulceration than coconut water in rats (Nneli & Woyike, 2008). *Aegle marmelos* seeds show anti-ulcer activity and the property is attributed to the presence of quercetin like (Flavonoid) contents (Sharma et al., 2011). Beta-carotene present in carrots is of anticancer, antimutagenic, antitumor, immunostimulating, anticoronarios, antiulcer, antifotofóbicos and antidegenerativos. It protects the stomach, preventing the formation of ulcers (www.made-in-argentina.com). The common vegetable tomato (*Lycopersicon esculentum* Mill.) has been recognized as an important source of dietary flavonoids. The dihydrochalcone phloretin 3',5'-di-C-beta-glucopyranoside, flavonol quercetin 3-O-(2''-O-beta-apiofuranosyl-6''-O-alpha-rhamnopyranosyl-beta-glucopyranoside), phloretin 3',5'-di-C-glc, chalconaringenin, kaempferol 3-rutinoside, and quercetin 3-rutinoside (rutin) are present in tomatoes (Slimestad et al., 2008).

Antiulcer property of *Tephrosia purpurea*, with flavonoids tephrosin, pongaglabol and semiglabrin (Ahmad et al., 1999) has also been reported by
Deshpande et al. (2003). Cytoprotective effect of *Morinda tinctoria* Roxb. against surgical and chemical factor induced gastric and duodenal ulcers in rats has also been reported (Sivaraman & Muralidharan, 2012).

Thus majority of the plants used, in the present study, to treat Acid Peptic Diseases have been experimentally proved along with the presence of antiulcer flavonoids. Modern drugs like Proton Pump Inhibitors (PPIs) and $H_2$ receptor antagonists are effective to treat peptic ulcer, but they have several short term and long term side effects (Rossi, 2005). Synergistic herbal compositions for the treatment of gastric ulcer have been patented by Rao et al., (2010). It is also to be mentioned that the plants used by the naturopathic paractitioners also show the modern approach in treating peptic ulcers. As mentioned earlier, the flavonoid ‘Catechins’ acts as an antiulcer agent by inhibiting the $H^+/K$ ATPase (Shohaib et al., 2011). The gastro protective action of aqueous extract of *Murraya koenigii* against stress-induced ulceration could be due to its histamine antagonistic, anticholinergic and/or antisecretory effects (Sharma et al., 2011). Among herbal drugs, liquorice, aloe gel and capsicum (chilli) have been used extensively. The plant kingdom might provide a useful source of new anti-ulcer compounds as simple dietary adjuncts to existing therapies (Borrelli & Izzo, 2000).
6. DENTAL PAIN

A toothache, also known as odontalgia or, less frequently, as odontalgy, is an aching pain in or around a tooth. “Some tortures are physical and some are mental, but the one that is both is dental” (Ogden Nash). “Every tooth in a man's head is more valuable than a diamond” (Miguel de Cervantes). For healthy teeth, oral hygiene and balanced diet with essential minerals and vitamins are essentials. For oral hygiene several kinds, pure chemical or herbal, toothpaste are available. Fluoride in various forms is the most popular active ingredient in toothpaste to prevent cavities. It occurs in small amounts in plants, animals, and some natural water sources. It has beneficial effects on the formation of dental enamel and bones. Triclosan, an antibacterial agent, is a common toothpaste ingredient in the United Kingdom. Triclosan or zinc chloride prevent gingivitis and, according to the American Dental Association, helps reduce tartar and bad breath.

Herbal toothpastes are made from natural ingredients and some are even certified as organic. Due to the increased demand of natural products, most of the toothpaste manufacturers now produce herbal toothpastes. Many herbal toothpastes do not contain fluoride or sodium lauryl sulfate. The ingredients found in natural toothpastes vary widely but often include baking soda, aloe, eucalyptus oil, myrrh, plant extract (strawberry extract), and essential oils.
In addition to the commercially available products, it is possible to make one's own toothpaste using similar ingredients. In the present survey the following plants are used for dental problems, by brushing the powder of some plant parts and also by taking internally some plant parts as medicines: *Achyranthes aspera*, *Azadirachta indica*, *Citrus aurantium*, *Citrus limon*, *Cocos nucifera*, *Cynodon dactylon*, *Ficus benghalensis*, *Mangifera indica*, *Emblica officinalis*, *Solanum anthocarpum*, *Tamarindus indica* and *Terminalia chebula* (Table 8). Several herbs, like *Azadirachta indica* and *Ficus benghalensis* with antimicrobial activities keep the tooth without bacterial decay and other herbs like *Emblica officinalis*, *Citrus aurantium* and *Citrus limon* provide enough vitamins for tooth health.

The number of teeth present had a significant relationship with the intake of several nutrients such as total protein, animal protein, sodium, vitamin D, vitamin B6, niacin, and pantothenic acid. The intake of vegetables and fish, shellfish, and their products was significantly lower among subjects with fewer teeth (Meurman, Murtomaa, 1986). Intake levels of calcium and vitamin D aimed at preventing osteoporosis have a beneficial effect on tooth retention (Krall et al., 2001). Although a suitable low concentration of fluoride in drinking water is beneficial to health, a high concentration can produce dental and skeletal fluorosis which can be treated easily by the fruits of *Emblica officinalis* which removes excessive fluoride from the body (Veeraputhiran & Alagumuthu, 2012).
JAUNDICE

Jaundice (also known as icterus) is a yellowish pigmentation of the skin, the conjunctival membranes over the sclerae (whites of the eyes), and other mucous membranes caused by hyperbilirubinemia (increased levels of bilirubin in the blood). This hyperbilirubinemia subsequently causes increased levels of bilirubin in the extracellular fluid. Concentration of bilirubin in blood plasma does not normally exceed 1 mg/dL (17 µmol/L). A concentration higher than 1.8 mg/dL (30 µmol/L) leads to jaundice. Bilirubin is a yellow chemical in hemoglobin, the substance that carries oxygen in your red blood cells. As red blood cells break down, your body builds new cells to replace them. The old ones are processed by the liver. If the liver cannot handle the blood cells as they break down, bilirubin builds up in the body and your skin may look yellow. Jaundice is often seen in liver disease such as hepatitis or liver cancer. It may also indicate leptospirosis or obstruction of the biliary tract, for example by gallstones or pancreatic cancer, or less commonly is congenital in origin. Jaundice is the disease which is mainly occurred from the liver problem or liver dysfunction which makes the patient vulnerable to be effected by the hepatitis virus. Though the viral cause of jaundice can be stated as the immediate source of the disease, the breeding ground of the disease is the poor liver function.
Current chemotherapeutic methods by using hepatoprotective chemicals will lead to further damage of the liver. Naturopathic treatment of liver is easy and best way of treatment for the malfunction of liver, particularly in the case of jaundice. There are a large number of plants with hepatoprotective activity (Adewusi & Afolayan, 2010, Vipin Kumar et al., 2012) with hepatoprotective chemicals (Adewusi & Afolayan, 2007). Adewusi and Afolayan (2007) in their review showed hepatoprotective plants with species from India. Glycosides, flavonoids, triterpenes and phenolic compounds are the classes of compounds with hepatoprotective activity. Recently, Anil Kumar (2012) has enumerated about hepatoprotective plants.

In the present survey naturopathic diet schedule for jaundice is given in table. *Ananas comosus*, *Cocos nucifera*, and *Emblica officinalis*, *Citrullus lanatus*, *Citrus aurantium*, *Malus sylvestris*, *Phyllanthus niruri*, *Vitis vinifera*, *Aeglemarmelos* and *Arachis hypogea* are the top ten species used to treat jaundice. The scrutiny of literature shows the reports of hepatoprotective and antioxidant activities in several plants of the present survey. Hepatoprotective activity in *Emblica officinalis* (Gulati et al., 1995, Malar & Bai, 2009); antioxidant and hepatoprotective activity in *P. niruri* (Harish & Shivanandappa, 2006); antioxidant activity in *A nanas comosus* (Erukainure et al., 2011); anti-inflammatory, analgesic, antioxidant activities (Gill et al., 2010), antacid and carminative activities (Sharma et al., 2012) in *Citrullus lanatus*; antioxidant, antitumor (Khan & Sultana, 2009), immunomodulatory (Govinda & Asdaq, 2011)...
and hepatoprotective activities (Singanan et al., 2007) in *A. marmelos*. Antioxidant activity in *M. sylvestris* (Kondo et al., 2002), hepatoprotective activity in *C. aurantium* (Karaca et al., 2005) and antioxidant and hepatoprotective effect (Loperito & Rajamohan, 2003) in seed testa of *A. hypogea* (Huang et al., 2003) and antioxidant and antithrombotic effect (Prathapan & Rajamohan, 2011) in tender coconut water have been reported. Ethanolic extract and four different fractions of it from the leaves of *V. vinifera* show remarkable hepatoprotective effects (Orhan et al., 2007). Total triterpenoids and total flavonoids from *V. vinifera* show hepatoprotective effects against immunological liver injury in mice (Liu et al., 2012). Onion, *A. cepa* also has hypoglycemic, antioxidant and hepatoprotective effects (Ogunmodede et al., 2012). *B. hispida* protects the liver from toxicity (Das & Roy, 2011). Thus all top ten plants of the present survey used in jaundice with antioxidant and hepatoprotective activities show successful naturopathic treatment of jaundice.

As far as jaundice is concerned, naturopathic treatment mainly aims to improve the function of liver both by reducing the workload by avoiding indigestible cooked foods which are replaced by uncooked fruits, vegetables and herbs along with important hepatoprotective herbs which helps to recover the liver to normal condition.
The human eye is an important sense organ which reacts to light for several purposes. Rod and cone cells in the retina allow conscious light perception and vision including color differentiation and the perception of depth. The human eye can distinguish about 10 million colors. There are many types of eye problems and visual disturbances like blurred vision, halos, blind spots, floaters, and other symptoms.

If avoidable blindness is to be substantially reduced in India by 2020, effective strategies against blindness due to cataract and refractive error are needed urgently as both these conditions are relatively easy to treat (Dandona et al., 2000). Cataract and refractive errors are major causes of blindness and low vision and control strategies should prioritize them. Most blindness and low vision burden is avoidable (Neena et al., 2008).

It is well understood that several vitamins, particularly vitamin A and beta Carotene, play an important role in eye health and eye function. Vitamin A protects the surface of the eye (cornea), it is essential for good vision, cures specific type of eye inflammation called superior limbic keratoconjunctivitis and slows the progression of Stargardt disease, an inherited eye disease that causes severe vision loss in young people. People at high risk for the Age-related Eye Disease took a daily multiple vitamins that included vitamin A (as beta carotene), vitamin C, vitamin E, zinc and copper which had a percent reduced risk of advanced AMD.
during a six-year period. Vitamin A and lutein may prolong vision in people suffering from retinitis pigmentosa. It’s estimated that approximately 250,000 to 500,000 malnourished children worldwide become blind each year due to vitamin A deficiency that could have been prevented with a proper diet. One of the first signs of vitamin A deficiency is night blindness. A lack of vitamin A causes the cornea to become very dry, leading to clouding of the front of the eye, corneal ulcers and vision loss. Vitamin A deficiency also causes damage to the retina, which also contributes to blindness (http://www.allaboutvision.com/nutrition/vitamin-a.htm). A 22-year-old Caucasian girl living in Glasgow presented with eye disease due to vitamin A deficiency which was due to her bizarre dietary habit (uchanan et al., 1987). Eye movement disorders are rarely reported in vitamin B12 deficiency. But there are two cases with eye movement disorder and vitamin B12 deficiency—one with bilateral internuclear ophthalmoplegia and the other with downbeat nystagmus (Akdal et al., 2007).

Oxidative and particularly photo-oxidative processes are critical factors in many ocular conditions, but are often poorly recognized by those investigating ocular disease. Oxidative stress in inflammatory processes of the conjunctiva, cornea, and uvea in cataract formation in the lens in retinal degeneration and in optic nerve pathologic conditions, inflammatory in optic neuritis and degenerative in glaucoma have been discussed by Illiams. Person with early cataract are under increased systemic oxidative stress (et al., 2009).
Oral antioxidants improved both tear stability and conjunctival health (Blades et al., 2001) and in elderly patients to withstand the problems of sight-threatening eye diseases related to oxidative stress and accelerated biological ageing linked with earlier onset of diseases (Babizhayev, 2010).

From the above account, it is understood that several cases of eye problems mainly due to vitamin deficiency and oxidative stress may be effectively treated by diet therapy. There are various methods in Ayurveda to improve eyesight.

Ayurvedic Diet and herbs for improving Eye Sight (http://ayurveda-foryou.com/treat/improve_eyesight.html): Diet: Apple, grapes, carrots, cucumber, spinach, turnip, tomato, lettuce, cabbage, soya beans, green peas, oranges, dates, almond, cardamom and blue berries. Herbs: Amla, asparagus, bhringraj, black pepper, garlic rose petals, liquorice, triphala. It is helpful in curing various eye problems like cataracts, glaucoma, progressive myopia, and conjunctivitis. It is also used to wash the eyes, in order to reduce their redness. Triphala is very helpful in treating impaired vision. Triphala nourishes the nerves and tissues of the eyeball, including the eye lens. There are also several experimental evidences to show herbal medicines for eye problems. Curcumin could have potential benefits in inhibiting the development of retinopathy in diabetic patients (Kowluru & Kanwar, 2007).
In the present survey (Table 1), Cocos nucifera, Alternanthera sessilis, Cucumis sativus, Daucus carota, Eclipta prostrata, Musa paradisiaca, banana, Carica papaya and Cassia auriculata are the top ten species used to treat eye diseases.

The nutrients of the fruits and vegetables used in the present survey for eye diseases may improve the eye health vision directly by supporting eye function and also indirectly by providing good environment without free radicals by antioxidants and by promoting blood circulation in eyes. Most of the species, particularly fruits and leafy vegetables, are good source of antioxidants, vitamins and minerals. Hematinic activity of Alternanthera sessilis (Arollado & Osi, 2010) may improve the eye health by improving blood circulation. Carica papaya protects the neurons from oxidative stress (Guizani et al., 2011).

In general, most of the problems related to eyes are due to unhealthy dietary habits like taking indigestible foods, irregular food timings and inadequate sleep. Hence, in naturopathy healthy and easily digestible fruits and vegetables are suggested for normal function of eyes.
9. POLIO

Poliomyelitis, often called polio or infantile paralysis, is an acute, viral, infectious disease spread from person to person, primarily via the fecal-oral route (Chamberlin & Narins, 2005). Although approximately 90% of polio infections cause no symptoms at all, affected individuals can exhibit a range of symptoms if the virus enters the blood stream (Ryan & Ray, 2004). In about 1% of cases, the virus enters the central nervous system, preferentially infecting and destroying motor neurons, leading to muscle weakness and acute flaccid paralysis. Different types of paralysis may occur, depending on the nerves involved. Spinal polio is the most common form, characterized by asymmetric paralysis that most often involves the legs. Bulbar polio leads to weakness of muscles innervated by cranial nerves. Bulbospinal polio is a combination of bulbar and spinal paralysis (Atkinson et al., 2009). Two basic patterns of polio infection are described: a minor illness which does not involve the central nervous system (CNS), sometimes called abortive poliomyelitis, and a major illness involving the CNS, which may be paralytic or nonparalytic (Falconer & Bollenbach 2000). In most people with a normal immune system, a poliovirus infection is asymptomatic. Rarely, the infection produces minor symptoms; these may include upper respiratory tract infection (sore throat and fever), gastrointestinal disturbances (nausea, vomiting, abdominal pain, constipation or, rarely, diarrhea), and influenza-like illness (Atkinson et al., 2009).
Prior to 2006, there was an outbreak in 2002 when 1600 cases of polio were detected. The polio outbreak in 2006 started from two districts of West UP - Moradabad and JP Nagar, from where it spread to other districts in West UP, districts of Central and Eastern UP, Bihar and other states (Indian Health News, 21st Aug. 2007). Serious efforts have been taken by the Indian government to make India as a polio free country. Health Minister Ghulam Nabi Azad, at the polio summit 2012 in New Delhi in the presence of Prime Minister Manmohan Singh, said that the “WHO has taken India’s name off the list of polio endemic countries in view of the remarkable progress that we have made during the past one year” (APPN NEWS, Feb. 25, 2012). The above achievement is by giving polio vaccine for all the children throughout the country with massive programs. Now the question is: Whether this achievement is permanent or temporary?, How long the vaccination program should be continued?, Is the Oral Poliovirus Vaccine (OPV) 100% health-proof?

There are some evidences of reappearance of Polio even after complete eradication. It is also told that the vaccine virus and not just wild poliovirus will have to be rigorously contained after eradication and that thorough polio surveillance will have to continue for quite a number of years not only after eradication but also after the cessation of immunization (Bull. WHO vol.79 no.1 Genebra 2001).
There is a report that intestinal immunity to poliovirus develops only after repeated infections in monkeys (Selvakumar & John, 1989). The most important criterion for certification of a country, a region or indeed the world is the absence of poliovirus isolation for at least three years under conditions of adequate surveillance (Wood et al., 2000). During the last 20 years several cases of polio were recorded in Tamil Nadu, and several naturopathic practitioners had an experience of treating polio attacked persons with their own experience and knowledge which have been documented in the present study. In the modern world with drastic climate change, we could not guarantee 100% polio-free status in future. The traditional knowledge will be of permanent document for any kind of future reference and uses.

Designing safe and effective antiviral drugs is difficult, because viruses use the host's cells to replicate and so it is difficult to find targets for the drug that would interfere with the virus without also harming the host organism's cells. Moreover, the major difficulty in developing vaccines and anti-viral drugs is due to viral variation. Alternative tactic involves encouraging the body's immune system to attack them, rather than attacking them directly. This can be achieved by healthy nutrients and immunomodulating agents from natural edible sources like fruits, vegetables and other herbs. Herbs and spices recommended in the Ayurvedic cure for polio are Fennel, Ginger, Black pepper, Coriander and Licorice (Ayurvedic -Medicines. Com).
Strawberry extract inactivated several enteric viruses and herpes simplex virus, and extracts of several fruits inactivated poliovirus. Several compounds of plant origin, like tannic acid, are found to be antiviral. Treatment of HEp2 cells with strawberry extract or tannic acid reduced subsequent infection with virus, almost a log; inhibition was prevented and reversed completely with serum or gelatin. The antiviral components of various fruits, commercial juices and beverages may act both on viruses and host cells to prevent infection (Konowalchuk & Spiers, 1976, 1978). Infusions and extracts of different grapes inactivated poliovirus; agents responsible for this property resided in the skin of the grape. Commercial grape juice inactivates various enteric viruses and herpes simplex virus; a 1,000-fold reduction in poliovirus infectivity occurred after incubation with grape juice, pH 7.0, for 24 h at 4 degrees C. A variety of wines are reported to be antiviral but to a lesser extent than grape juice; red wines were more antiviral than white (Konowalchuk & Speirs, 1977). Torvanol A, torvoside H and acetal derivative of the torvoside H from fruits of *Solanum torvum* exhibited antiviral activity (herpes simplex virus type 1) with IC(50) values of 9.6, 23.2 and 17.4 microg/ml, respectively (Arthan et al., 2002). Many hundreds of herbal preparations with antiviral activity have been identified. Yet extracts from only 11 species met the basic criteria and have been tested in clinical trials, majority of which include *Phyllanthus* sp. (Martin & Ernst, 2003).
The top 10 plant species of the present survey (Table 11) to treat and prevent Polio includes, *Citrus limon*, *Cocos nucifera*, *Vitis vinifera*, *Carica papaya*, *Musa paradisiaca*, *Pyrus communis*, *Citrus aurantium*, *Mangifera indica*, *Emblica officinalis* and *Psidium guajava*. Several studies confirmed that most viral infections are initially limited by the early nonspecific defenses, which restrict the initial virus multiplication to manageable levels and initiate recovery. Recovery is then completed by a combination of these early non-specific defenses and the subsequent virus-specific immune defenses. The early non-specific defenses enable the host to cope with the peak accumulation of viruses that, if presented as the initial infecting dose, could be lethal (Baron *et al.*, 2000). Selenium augmented the cellular immune response through an increased production of interferon γ and other cytokines. Humoral immune responses were unaffected. Selenium also showed more rapid clearance of the poliovirus (Broome *et al.*, 2004). Zinc-deficient persons experience increased susceptibility to a variety of pathogens (Shankar & Prasad, 1998). Selenium and Zinc contents of some of the top ten species in the present survey are: 1.2 mcg, 0.18mg -banana, 0.2 mcg, 0.11mg -grapes, 0.1mcg, 0.38mg – Guava, 0.3 mcg, 0.05mg -lemon, 0.7 mcg, 0.09mg -orange, 0.8 mcg, 0.24mg -papaya, 1.2 mcg, 0.08mg -mango (http://www.dietandfitnessaccount.com/fruits). Thus the minerals and vitamins of these fruits improve the immune system of the patient and have the natural power to fight with the enemies.
Leprosy, also known as Hansen's disease (HD) is a chronic infectious disease caused by *Mycobacterium leprae* and *M. lepromatosis* which mainly affects the skin, peripheral nerves, upper respiratory tract and the eyes. According to WHO's latest estimate, around 35% of new leprosy cases in India - 48,000 - are women. India also recorded the highest number of children newly detected with leprosy -13,610. India, which is home to over 700 leper colonies, was also ahead of all other countries in the number of relapse cases at 325. Official figures show that approximately 2.49 lakh new cases were reported globally in 2008. The leprosy causing bacteria multiplies very slowly and the incubation period of the disease is about five years. Symptoms can take as long as 20 years to appear. It is curable and treatment provided in the early stages averts disability. India's National Health Policy 2002 had set the goal of elimination of leprosy (reduce the number of cases to less than 1/10,000 population) by the year 2005. India achieved this goal in December 2005, when the recorded prevalence rate in the country was 0.95/10,000 population (Times of India, 8th Feb. 2010).

The oil from seeds of *Hydnocarpus wightiana* or Chaulmoogra tree (Achariaceae) has been widely used in Indian medicine and Chinese traditional medicine for the treatment of leprosy. Modern leprosy drugs would not exist without chaulmoogra oil, which comes from the seeds of *Hydnocarpus wightiana*, *H. anthelmintica*, and *Taraktogenos kurzii*. Chaulmoogra oil is available as a
topical oil (http://ayurvedherbs.com/chalmoogra-oil.html). Hydnocarpic acid (HA), a principal constituent of chaulmoogra oil, inhibits multiplication in vitro of a number of mycobacterial species. It has been suggested that HA may act by blocking the coenzymatic activity of biotin, or it may inhibit microbial biotin synthesis (Jacobsen & Levy, 1973). Chaulmoogra oil contains chaulmoogric acid [chemical name 13-(2-cyclopenten-1-yl) tridecanoic] and hydnocarpic acid [chemical name 11-(2-cyclopenten-1-yl) undecanoic] as major components.

In the present study among the top 10 plant species (Table 12) used for the treatment of Leprosy, *Citrus limon* is the dominant species represented by 13% with 4 number of usages followed by *Coconut nucifera* and *Vitis vinifera* by 12% (4 number of usages each), and other species such as *Achras zapota*, *Aegle marmelos*, *Anacardium occidentale*, *Artocarpus heterophyllus*, *Carica papaya*, *Citrus aurantium* and *Musa paradisiaca* by 9% each (3 usages) respectively.

Current study revealed that essential orange oil had significant antimicrobial activity (Kamalak et al., 2011). Palmitic, oleic and linoleic acids are the major components of *Citrus limon* seed oil (Waheed et al., 2009). Leaves of *Vitis vinifera* show 73% activity against *Mycobacterium tuberculosis* H37Rv (ATCC 27294) (Tosun et al., 2005). Seeds of *Vitis vinifera* contain Linoleic acid, Palmitic acid, gamma-Sitosterol and Glycerin (Kumar & Vijayalakshmi, 2011). The juice of the young spadix of coconut is useful in dyspepsia,
diarrhoea, dysentery, diabetes, haemoptysis, strangury, leprosy and general debility (http://www.ayurvedakalamandiram.com/fruits.htm). The resin, with 90% of anacardic acid and 10% cardol, from trunk of *Anacardium occidentale* is therapeutically used externally in leprosy (Pardo de Tavera 2008). The powdered and sundried leaves of *Eleusine coracana* when sprinkled on the wound after taking bath proved to be an effective remedy for the treatment of leprosy (Rishabha *et al.*, 2012). Leaves of *Aegle marmelos* show moderate antibacterial activity against *Mycobacterium tuberculosis* (Green *et al.*, 2010). Ripe and unripe *Carica papaya* fruits (epicarp, endocarp, seeds and leaves) have very significant antibacterial activity on *Staphylococcus aureus*, *Bacillus cereus*, *Escherichia coli*, *Pseudomonas aeruginosa* and *Shigella flexneri* (Emeruwa, 1982).

Current recommendations for the treatment of leprosy suggest multidrug regimens rather than monotherapy because such a regimen has proven to be more effective, delays the emergence of resistance, prevents relapse, and shortens the duration of therapy.

The most prominent side-effects of the antileprotic drug, Dapsone, are dose-related hemolysis (which may lead to hemolytic anemia) and methemoglobinemia. About 20% of patients treated with dapsone suffer hemolysis and the side-effect is more common and severe in those with glucose-6-phosphate dehydrogenase deficiency, leading to the dapsonecontaining
antimalarial combination. Toxic hepatitis and cholestatic jaundice have been reported by the manufacturer. Jaundice may also occur as part of the dapsone reaction or dapsone syndrome. Dapsone is also known to inhibit the Cytochrome P450 system. Cases of ichthyosis and skin dryness are reported in response to the drug clofazimine (8%-28%), as well as rash and pruritis (1-5%). 40-50% of patients develop gastrointestinal intolerance. Rarely, patients have died from bowel obstructions and intestinal bleeding, or required abdominal surgery to correct the same. Side effects of other antileprotic drugs have also been given in the review of ‘Antileprotic drugs: An overview’ by Mane et al. (2012). So, multidrug regimens in naturopathy will be a successful practice to treat Leprosy.

The various herbal drugs such as *Amaranthus spinosus, Terminalia bellirica Centella asiatica, Aristolochia bracteolata, Fusidium coccineum, Curcuma longa* etc known for their potential antileprosy activity. The various branded herbal formulations like Divya KayakalpVati, Mahamanjishthai Ark, Mahatikta Ghrita, and Kaishore Guggulu etc are available in the market as antileprosy (Mukesh et al., 2011).

Based on the present study, it has been observed that leprosy can be cured successfully by improving digestion and by enhancing the activity of skin which are achieved by following natural mode of living and by strengthening and invigorating the whole body by means of healthy diet and cleansing the system.
11. ELEPHANTIASIS

Elephantiasis occurs in the presence of microscopic, thread-like parasitic worms such as *Wuchereria bancrofti*, *Brugia malayi*, and *B. timori*, all of which are transmitted by mosquitoes. However, the disease itself is a result of a complex interplay between several factors: the worm, the symbiotic *Wolbachia* bacteria within the worm, the host’s immune response, and the numerous opportunistic infections and disorders that arise. Consequently, it is common in tropical regions and Africa. The adult worms only live in the human lymphatic system. The parasite infects the lymph nodes and blocks the flow of lymph throughout the body, these results in chronic edema, most often noted in the lower torso (typically in the legs and genitals) (Kenneth, 2007). Elephantiasis characterized by the thickening of the skin and underlying tissues, especially in the legs and male genitals. In some cases the disease can cause certain body parts, such as the scrotum, to swell to the size of a basketball. It is caused by filariasis or podoconiosis (Gail, 2008).

Microfilarial development was retarded in female worms from vitamin A deficient animals as compared with normal ones (Storey, 1982). 

DEC-fortified salt has been used successfully as a principal public health tool to eliminate lymphatic filariasis (LF) in China and, less extensively, in several other countries. Studies from 1967 to the present conducted in Brazil, Japan, Tanzania, India, China, and Taiwan involving administration of DEC salt for 18 days to 1 year, have shown this
intervention to be effective for both bancroftian and brugian filariasis, as measured by reductions in both microfilarial density and positivity, and in some studies through reduction in mosquito positivity rates as well (Houston, 2000).

Traditional medical practice to treat elephantiasis is practiced by people from different countries by using plants like *Calotropis gigantea* and *Eclipta prostrata* (Sikdar & Dutta, 2000), *Euphorbia pseudogranitii*, *enna singuana* (Kareru et al., 2007), *Allophus serratus* (Umashanker & Shruti, 2011). *Emblica officinalis*, *Aithania sominera*, *ida cordiolia*, *Centella asiatica*, *Uncuna pruriens* are used in Ayurveda to treat elephantiasis (http://www.ayushveda.com/health/shleepada/jwara.htm).

In the present survey the following vegetables, fruits and herbs (Table 13) are used to treat elephantiasis in order to provide required nutrients. *Centella asiatica*, *Eclipta prostrata*, *Citrus limon*, *Carica papaya*, *Ananas comosus*, *Cocos nucifera*, *Vitis vinifera*, *Citrus aurantium*, *Piper nigrum*, *Daucus carota*, *Trichosanthes anguiana*, *Cucumis sativus*, *Cucurbita pepo*, *Oryza sativa*, *Phoenix dactylifera*, *Solanum melongena* and *Moringa oleifera*. As mentioned above, many of these plants have been reported in traditional medicinal practice to cure elephantiasis.
TUBERCULOSIS

Tuberculosis, MTB, or TB (short for *tubercle bacillus*) is a common, and in many cases lethal, infectious disease caused by various strains of mycobacteria, usually *Mycobacterium tuberculosis* (Kumar et al., 2007). Tuberculosis typically attacks the lungs but can also affect other parts of the body. It is spread through the air when people who have an active TB infection cough, sneeze, or otherwise transmit their saliva through the air (Konstantinos, 2010). Most infections are asymptomatic and latent, but about one in ten latent infections eventually progresses to active disease which, if left untreated, kills more than 50% of those so infected. The classic symptoms of active TB infection are a chronic cough with blood-tinged sputum, fever, night sweats, and weight loss (the latter giving rise to the formerly prevalent term "consumption"). Infection of other organs causes a wide range of symptoms.

One third of the world’s population is thought to have been infected with *M. tuberculosis*, with new infections occurring at a rate of about one per second (WHO, 2010). In 2007, there were an estimated 13.7 million chronic active cases globally (WHO, 2009), while in 2010 there were an estimated 8.8 million new cases and 1.5 million associated deaths, mostly occurring in developing countries (WHO, 2011). The absolute number of tuberculosis cases has been decreasing since 2006, and new cases have decreased since 2002 (WHO, 2011). The distribution of tuberculosis is not uniform across the globe; about 80% of the
population in many Asian and African countries test positive in tuberculin tests, while only 5–10% of the United States population tests positive (Kumar et al., 2007). More people in the developing world contract tuberculosis because of compromised immunity, largely due to high rates of HIV infection and the corresponding development of AIDS (Lawn & Zumla, 2011).

Treatment is difficult and requires administration of multiple antibiotics over a long period of time. Antibiotic resistance is a growing problem in multiple drug-resistant tuberculosis (MDR-TB) infections. The side effects of common antituberculotic agents, isoniazid, rifampin, ethambutol etc have been given by Addington (1979). It is expected that development of the new effective anti-TB drug will bring us various outcomes such as shortening the total duration treatment, improvement of the treatment completion ratio, prevention and treatment of the multiple drug resistant tuberculosis (MDR-TB) and reducing the total medical expenditure. A new anti-TB drug needs to show the well pharmacokinetic distribution and permeation into lung tissue and cells. Furthermore, it is also desired that the novel candidate exhibits the potent bactericidal activity both against exponential and stable phase of \textit{M. tuberculosis} \textit{in vivo} (Khairnar et al. 2012).
In the present study the diet schedule for tuberculotic patients has been given in Table 1. Antituberculotic species are *Cocos nucifera*, *Carica papaya*, *Cucumis sativus*, *Mangifera indica*, *Musa paradisiaca*, *Emblica officinalis* and *Vitis vinifera*, *Phoenix sp.*, *Citrus aurantium*, *Cynodon dactylon*.

Several medicinal plants show antituberculotic activity. Examples are: *Acalypha indica*, *Adhatoda vasica*, *Aloe vera*, *Allium cepa* and *Allium sativum* (Gupta *et al.*, 2010), fruits of *Zanthoxylum limonella* (Charoenying *et al.*, 2008), *Bromelia balansae* (Coelho *et al.*, 2010). Prenylated xanthones, isolated from the fruit hulls and the edible arils and seeds of *Garcinia mangostana*, show antituberculosis potential. Alpha- and betamangostins and garcinone B exhibit strong inhibitory effect against *Mycobacterium tuberculosis* with the minimum inhibitory concentration (MIC) value of 6.25 microg/ml (Suksamrarn *et al.*, 2003).

Literature survey show that there are no reports on antituberculotic activity in the top ten plants of the present survey to treat tuberculosis. In contrast, there are several reports to show the role of vitamins and minerals, in association with tuberculosis. Vitamin D influences the immune response to tuberculosis, and its deficiency has been associated with increased tuberculosis risk in different populations. Genetic variability may influence host susceptibility to developing active tuberculosis and treatment response (Chocano-Bedoya & Ronnenberg, 2000). Once triggered by vitamin D, macrophage cells are capable of releasing
antibacterial peptides (parts of protein) like cathelicidin, and these antibacterial proteins play a critical role in the immune system and prevention of infection. Vitamin D deficiency is a clear risk factor for tuberculosis and leprosy. Martineau et al. (2007) described the historical use of vitamin D in tuberculosis treatment discussed the mechanisms by which it may modulate host response to infection with *Mycobacterium tuberculosis* and reviewed three clinical trials and ten case series in which vitamin D has been used in the treatment of pulmonary tuberculosis. L-arginine, the precursor of nitric oxide, and vitamin D recently, has elucidated mycobactericidal and immunomodulatory actions against TB and are deficient in people with TB. By enhancing mycobacterial killing in macrophages, L-arginine and vitamin D might have the potential to enable shorter duration of treatment, reduced infectivity and improved response in drug-resistant TB (Ralph et al., 2008).

There are also the importance of vitamin E and vitamin A in relation to tuberculosis. 2-month intervention with vitamin E and selenium supplementation reduces oxidative stress and enhances total antioxidant status in patients with pulmonary TB treated with standard chemotherapy (Seyedrezazadeh et al., 2008). Severe TB is associated with vitamin A deficiency (Pakasi et al., 2008). Vitamin A may enhance the antigen-specific *in vitro* response of peripheral blood mononuclear cells from TB patients (Cernande et al., 2008). Vitamin E enhanced the antioxidant status of the plasma, thereby preventing membrane injury, consequently reducing the risk of stone formation in urogenital
tuberculosis patients, who were treated with their routine anti-tuberculosis drug regimen (Srinivasan et al., 2004). Vitamin A deficiency has been commonly observed in patients with tuberculosis. Zinc deficiency is also common in tuberculosis, which may impose a secondary vitamin A deficiency. So supplementation with multiple micronutrients (including zinc) rather than vitamin A alone may be more beneficial in patients with tuberculosis, but clinical trials on such a combination are lacking (Mathur, 2007). Supplementation with Multi Vitamin and Minerals, including zinc, during treatment of pulmonary TB may reduce mortality in those co-infected with HIV (Range et al., 2006). The administration of vitamin C, ascorbic acid, and emoxypine during the first 10 days of the standard schedule ensures accelerated resolution of tubercular infiltrates and increased rate of closing of the tuberculous disintegration cavities. The use of emoxypine accelerates the eradication of Mycobacterium tuberculosis (Novoselov, 2009).

Oxidative stress by the free radicals may in turn contribute towards pulmonary inflammation if not neutralized by antioxidants. Total antioxidant status of TB patients should be considered for more effective disease control and that diets low in antioxidants may render individuals susceptible to tuberculosis (Iid et al., 2004). Crude catechin of green tea extract can play a definite role as adjuvant therapy in management of oxidative stress seen in pulmonary tuberculosis patients (Agarwal et al., 2010). Isoniazide is an essential component of all anti-tubercular regimens. Carbohydrates reduce absorption of isoniazide
which is rapidly absorbed on fasting condition. Biological half life was increased on simultaneous administration of coconut milk with isoniazide (Bigonia et al., 2005). The juice of the plantain or the ordinary cooking bananas works miracles in tile cure of tuberculosis. It claims to have cured patients in an advanced stage of this disease with frequent cough, abundant expectoration and high fever in two months, by this treatment (Bhowmik et al., 2009). It may mainly be due to the presence of several essential nutrients. One medium banana contains 0.1 mg zinc, 1.2 mcg Selenium, 76 I U Vitamin A, 10 mg Vitamin C and 0.12 mg Vitamin E along with several other vitamins and minerals. Oranges are useful in the treatment of tuberculosis. Due to its saline action in the lungs, it eases expectoration and protects the body from secondary infections (Bhowmik et al., 2009). Edible portion of Cucumis sativus contains zinc (0.6 mg), Selenium (0.9 mcg), Vit. C (8.4 mg), Vit. A (316 I U), Vit. E (0.09 mg). Date fruits contain, considerable amount of Selenium (4.4 mcg), Zinc (0.43 mg), Vit. C (0.6 mg), Vit. E (0.07 mg). In general, infectious diseases, such as tuberculosis, are associated with increased requirements of both the macro- and micronutrients. So it is general practice to recommend a good multivitamin and mineral supplement through the diet.
Asthma

Asthma is the common chronic inflammatory disease of the airways characterized by variable and recurring symptoms, reversible airflow obstruction, and bronchospasm. Symptoms include wheezing, coughing, chest tightness, and shortness of breath. Asthma is clinically classified according to the frequency of symptoms, forced expiratory volume in 1 second (FEV1), and peak expiratory flow rate (Yawn, 2008). Symptoms can be prevented by avoiding triggers, such as allergens and irritants, and by inhaling corticosteroids.

Asthma and bronchitis prevalence rates in Karnataka, Gujarat, Haryana, Uttar Pradesh, Kerala and Madhya Pradesh are above national average (Ramanakumar & Aparajita, 2005). The following categories of drugs are used in asthma (Mali & Dhake, 2011):  

I. Bronchodilators: 1. \(\beta\)-adrenergic agonists: e.g. Metaproterenol, terbutaline, etc. 2. Anticholinergics: e.g. Ipratropium bromide, Tiotropium bromide. 3. Methylxanthines: e.g. Theophylline, aminophylline. 

II. Anti-inflammatory agents: 1. Corticosteroids: e.g. Prednisolone, dexamethasone etc. 2. Anti-leukotrienes: e.g. Probilukast, Iralukast, Zieluton etc. 3. Mast Cell Stabilizers: e.g. Cromolyn Sodium, Nedocromil sodium. Quality of asthma management in an urban community in Delhi, India is of unsatisfactory (Kotwani et al., 2012). A study conducted on a total no of 37 asthma patients show that nature cure treatment and yoga therapy helps in inducing positive health, alleviating the symptoms of disease by acting at physical and mental levels (Sathyaprabha et al., 2001).
Ayurvedic formulations used in the management of asthma, judiciously combine herbs to support the physiology of respiration, these herbs apart from exerting bronchial action also possess concomitant properties like antioxidant to support the digestive, cardiac, nerve functions and expectorant as well as just plain soothing herbs. Herbs and their active chemical constituents which have a role in the management of asthma have been compiled by Prasad et al., (2009). Recently, Kumar et al. (2011) have listed 28 medicinal plants which are used as natural medicines of bronchodilators and 20 medicinal plants with bronchodilators. The following list of herbs have been experimentally / clinically proved for antiasthmatic effect:

- *Crossopteryx febrifuga*, *Pteleopsis suberosa*, *Entada africana* (Occhiuto et al., 1999),
- *Justicia pectoralis*, *Pterodon polygaliflorus* (Leal et al., 2000),
- *Passiflora incarnata* (Dhawan et al., 2003),
- *Asystasia gangetica* (Akha et al., 2003),
- *Hypericum perforatum* (Gilani et al., 2005),
- *Curculigo orchioides* (Pandit et al., 2008),
- *Nigella sativa* (Boskabady et al., 2010),

In the present survey *Cocos nucifera*, *Mukia medusapatanas*, *Arachis hypogaea*, *Beta vulgaris*, *Citrus aurantium*, *Citrus limon*, *Daucus carota*, *Musa paradisiaca*, *Adhatoda zeylanica* and *Cicer arrietinum* are in the top ten plants used for Asthma. A detailed diet schedule for Asthma-patients has been given in table 15.
Many published works have documented that bronchial asthma-inflammation state is often associated with an increased generation of reactive oxygen species and free radical-mediated reactions. There are many studies regarding dietary interventions that confirm the relationship to oxidative stress, bronchial inflammation, the development of asthmatic symptoms and the lowered cellular reducing capacity. Simple dietary and environmental supplementations significantly reduce the oxidant stress, minimise the development of asthmatic symptoms, and should prove to be an effective new approach to asthma management in addition to current pharmacological strategies (Ricconi & D'Orazio, 2005).

The observed reduction in antioxidant intake in the British diet over 25 years has been a factor in the increase in the prevalence of asthma over this period (Soutar et al., 1997). Numerous studies have suggested that significant decreases in the intake of dietary anti-oxidants may be an important contributing factor to the increasing incidence of asthma over the last three decades (Soutar et al., 1997). In the present survey, two species of Citrus (C. limon, C. aurantiun) with potential antioxidant activity are in the top ten species used for asthma. The bioactive flavonoid in various Citrus species is 'Hesperidin'. Therapeutic mechanism of hesperidin to treat asthma is based on reductions of Th2 cytokines (IL-5), eotaxin, OVA-specific IgE production, and eosinophil infiltration via inhibition of GATA-3 transcription factor (Kim et al., 2011).
The extract from *Citrus grandis* var. *tomentosa* has significant antitussive, expectorant and antiasthmatic effects (Li *et al.*, 2006). Leaves of the dominant species of the present survey, *Muksa madaras patana* with large quantity of phenolics, flavonoid, carotenoids, vitamin C, E and saponarin, showed potent *in vitro* antioxidant/radical scavenging and metal chelating activities (Petrus *et al.*, 2011).

Epidemiological studies have shown that low serum 25-hydroxyvitamin D levels are associated with a higher risk of upper and lower respiratory infections in children and a shortage of vitamin D may contribute to asthmatic patients’ symptoms and morbidity rates. The hypothesis is that vitamin D could have a central role in these pathological situations and that it may represent a novel preventive and/or therapeutic strategy (Bozzetto *et al.*, 2012).

Essential minerals also play direct and/or indirect role in asthma. Truong-Tran *et al.*, (2001) have proposed that Zn has a protective role for the airway epithelium against oxyradicals and other noxious agents. Compared with healthy subjects, asthmatics had lower concentrations of Zn and Se; higher Cu concentrations, and Cu/Zn and Cu/Se ratios; and lower antioxidant enzyme glutathione peroxidase (GPx), glutathione reductase (GR) and catalase activities. Abnormal distributions of these trace minerals may aggravate oxidative damage and inflammation, increased CD4/CD8 lymphocyte ratios and decreased lung function in asthma (Guo *et al.*, 2011). So maintenance of balanced vitamin and mineral nutrition will be of successful practice to treat asthma. The present diet therapy for asthma provides essential vitamins, minerals along with effective bronchodilators and anti-inflammatory agents.
Psoriasis is fundamentally an inflammatory skin condition with reactive abnormal epidermal differentiation and hyperproliferation affecting 2-3% of world’s population. Pathophysiology of the disease includes mainly the activation and migration of T cells to the dermis triggering the release of cytokines which lead to the inflammation and the rapid production of skin cells. The possible factors and triggers causing psoriasis include emotional stress, skin injury, systemic infections, certain medications and intestinal upsets. Various types of psoriasis have been reported such as plaque psoriasis, psoriatic arthritis, scalp psoriasis, flexural psoriasis, guttate psoriasis, pustular psoriasis, nail psoriasis, erythrodermic psoriasis. Therapeutic agents that either modulate the immune system or normalize the differentiation program of psoriatic keratinocytes are suggested for treating psoriasis. There are various treatment regimens available for psoriasis such as topical agents, phototherapy, systemic agents, and homeopathic approach which can help to control the symptoms (Kuchekar et al., 2011). Ayurvedic (Momordica charantia, Azadirachta indica, Arctium lappa, Calendula officinalis, etc.) and Chinese Herbal Medicine have been used for centuries for treating psoriasis (Sindhu et al., 2009). Brown et al., (2004) have suggested that a dietary regimen based on Edgar Cayce's which includes a diet of fresh fruits and vegetables, small amounts of protein from fish and fowl, fiber supplements, olive oil, saffron, tea and slippery elm bark water and avoidance of red meat, processed foods, and refined carbohydrates may be an effective medical nutrition therapy for the complementary treatment of psoriasis.
The diet schedule, of the present survey, for patients with psoriasis include the top ten species *Cocos nucifera*, *Citrus limon*, *C. aurantium*, *Musa paradisiaca*, *Emblica officinalis*, *Cynodon dactylon*, *Abelmoschus esculentus*, *Acalypha indica* and *Arachis hypogea* (Table 16). First of all, it has to be understood that different stages of psoriasis is associated with oxidative stress. Skin is a major target of oxidative stress mainly due to reactive oxygen species (ROS) originating from the environment and skin metabolism itself. Regarding psoriasis, antioxidant strategies have proven to be beneficial therapeutics. Zhou *et al.* (2009) reviewed and summarized the current knowledge of the role of the redox system in regulating these signaling pathways related to the pathogenesis of psoriasis.

Enhancement of Reactive Oxygen Species production, decreased antioxidant potential (Arpita *et al.*, 2008, Kadam *et al.*, 2010) and ultimately leading to the imbalance (Yildirim *et al.*, 2003) of oxidants and antioxidants are the major cause for psoriasis. Propylthiouracil may be considered as treatment model in psoriasis, in particular for resistant cases, because of its antioxidant potential, and also antiproliferative and immunomodulatory effects (Utas *et al.*, 2002). Fasting periods, low-energy diets and vegetarian diets improved psoriasis symptoms in some studies, and diets rich in n-3 polyunsaturated fatty acids from fish oil also showed beneficial effects. All these diets modify the polyunsaturated fatty acid metabolism and influence the eicosanoid profile, so that inflammatory processes are suppressed. Some patients with psoriasis show an elevated sensitivity to gluten. In patients with IgA and/or IgG
antigliadin antibodies the symptoms have been shown to improve on a gluten-free diet. The active form of vitamin D, 1,25-dihydroxyvitamin D(3), exhibits antiproliferative and immunoregulatory effects via the vitamin D receptor, and thus is successfully used in the topical treatment of psoriasis (Wolters, 2005).

Psoriasis, the first Th1-mediated autoimmune disease, successfully treated in humans by immune deviation by immunomodulators like cytokines and fumaric acid esters (Ghoreschi & Röcken, 2004).

The present survey for the naturopathic treatment of psoriasis includes mainly the antioxidant-rich fruits like Citrus limon, C. aurantium, Emblica officinalis etc. along with other plants such as Acalypha indica, Ficus carica etc with anti-psoriatic and antidermatophytic agents. Psoralen, an active agent to treat several kinds of skin diseases like psoriasis, eczema and vitiligo is present in Ficus carica (Chunyan et al., 2009) and Citrus limon oil (Ziegler & Spiteller, 1992). Leaves and flowers of Acalypha indica contain four kinds of kaempferol glycosides: mauritianin, clitorin, nicotiflorin and biorobin (Nahrstedt et al., 2006). Abelmoschus esculentus with predominant phenolic compounds procyanidin B1 and rutin in seeds catechin, procyanidin B2, epicatechin and rutin in seeds also show strong antioxidant activity (Khomsug et al., 2010). The antioxidant activity was significantly increased in seeds of Okra by roasting, while in vivo digestibility showed that most antioxidative activities are available in the intestinal phase of gastrointestinal tracts (Adelakun et al., 2009). The diet formula of naturopathic treatment of psoriasis is also with an aim to improve general immunity of the body by vitamins and minerals.
15. LEUCODERMA

Leukoderma is a cutaneous condition, an acquired condition with localized loss of pigmentation of the skin that may occur after any number of inflammatory skin conditions, burns, intralesional steroid injections, postdermabrasion, etc (William et al., 2006). Vitiligo is a condition that causes depigmentation of sections of skin. It occurs, when melanocytes, the cells responsible for skin pigmentation, die or are unable to function. The cause of vitiligo is unknown, but research suggests that it may arise from autoimmune, genetic, oxidative stress, neural, or viral causes (Halder & Chappell, 2009). The most common form is non-segmental vitiligo, which tends to appear in symmetric patches, sometimes over large areas of the body.

Ayurveda described the disease along with Kustha. Use of some black seeds like Vakuchi (Psoralea corylifoli) together with Bhringaraja (Eclipta prostrata), Indravaruni (Citrullus colocynthis) and Rajan (Curcuma longa) are recommended for the cure of Swittra Roga (Barman, 1996). Leaf paste from Skimmia laureola (Rutaceae) mixed with cow’s urine is used for the treatment of psoriasis, leucoderma (Ranaa et al., 2010). The fruit Semecarpus anacardium (Joshi 2006), leaves, roots, fruits and seeds of Xanthium strumarium L. (Kamboj & Saluja, 2010) and roots of Ficus carica L. (Kirtikar & Basu, 1996) are used in the treatment of leucoderma.
Currently, several topical agents are available in many forms viz. methoxsalen (solution and cream), trioxsalen (solution), corticosteroids (gel, cream, ointment and solution) and calcineurin inhibitors (ointment and cream) (Millington, 2006). Although topical therapy has an important position in vitiligo treatment, side-effects or poor efficacy affect their utility and patient compliance. Garg et al. (2010) emphasized the potential of various phospholipid based carriers in optimizing and enhancing the topical delivery of anti-vitiligo agents, whilst reducing the side effects of drugs commonly used in its topical treatment. Apart from topical applications and surgical methods, phototherapy (UV treatment) represents the current treatment choice (Lotti et al., 2008). Topical immunomodulators display comparable effectiveness and fewer side effects (Forschner et al., 2007).

The commercial medicine ‘methoxsalen’ (also called xanthotoxin, marketed under the trade names Oxsoralen, Deltasoralen, Meladinine) itself is a naturally occurring furocoumarin compound found in several species of plants, including Psoralea corylifolia. It is a photoactive substance. Methoxsalen from Ammi majus (Apiaceae) allegedly clearing up the disease. Furanocoumarins are found mainly in plants belonging to the Umbelliferae and Rutaceae such as celery (Apium graveolens), carrots (Daucus carota) and parsnips (Pastinaca sativa), but also in plants of Rutaceae, Apiaceae, Asteraceae, Fabaceae, Oleaceae, Moraceae and Thymeleaceae families (Conforti et al., 2009).
The present survey shows the uses of 29 (Table 1) different species of edible plants to cure leucoderma. In the present survey, among the top 10 species, *Cocos nucifera* is represented by about 18% with 4 numbers of usages followed by *Carica papaya*, *Citrus limon*, *Musa paradisiaca* and *Vitis vinifera* as 13% with 3 numbers of usages. *Citrus aurantium* and *Psidium guajava* by about 9% with 2 number of usages, *Arachis hypogea*, *Benincasa hispida* and *Beta vulgaris* as 4% with single usage.

All the traditional and modern methods to treat leucoderma / vitiligo are by topical application of particular medicine. But the curing capacity of ordinary edible plants of the present survey can be attributed to the nutrients present, particularly vitamins and minerals along with several other secondary metabolites which may promote melanogenesis in melanocytes. There is a hypothesis that the micronutrients influence the production of melanin pigments and coloration (McGraw 2003). Acquisition of minerals from the diet is a unique, limiting factor for the expression of ornamental melanin coloration in animals (McGraw, 2006). Melagenic monk’s pepper (chaste tree, *Vitex agnuscastus*, Verbenaceae) berries contain essential oils, fatty oils, diterpenoids, ketosteroids, iridoid glycosides (agnuside and aucubine), saponins, and flavonoids (Schmid et al., 2006). Tunisian aromatic plant also promotes melanogenesis without affecting tyrosinase protein expression (Matsuyama et al., 2009).
Chloasma, skin discoloration on a woman’s faces due to hormonal changes during pregnancy, can be cured by the oral administration of proanthocyanidin-rich extract from grape seeds (Yamakoshi et al., 2004). Vitiligo treatment would involve consuming fresh fruits, vegetables, nuts, seeds, fish, pulses and whole grains. Since hydrogen peroxide is generated during melanin biosynthesis (Munoz-Munoz et al., 2009), Schallreuter and colleagues (1999, 2001) reported combination of phototherapy and antioxidants. Although some specialists insist that vitamin C is harmful in vitiligo because of its skin whitening properties, it is believed that the advantages of vitamin C as an antioxidant outweighs the risk of hypopigmentation, and it is recommended to the patients for taking vitamin C at a dosage of 0.5-2 grams daily (Yoon et al., 2011). Vitamin D nutrition increases skin tyrosinase response to exposure to UV radiation (Pavlovitch et al., 1982). Omega-3 fatty acids are poly-unsaturated fatty acids (PUFAs) are known to be beneficial for psoriasis and autoimmune diseases (Simopoulos, 2002). Gamma linolenic acid, another PUA from evening primrose oil, is considered effective for atopic dermatitis (Kerscher & Korting, 2002). Groundnut - JL-24 (Arachis hypogaea L.) which is one of the top ten species in the present study, shows the presence of 10.4 and 33.5% saturated and unsaturated fatty acid, respectively (Ingale & Shrivastava, 2011). The level of vitamin B12, folic acid, copper, and zinc in patients with vitiligo may be lower. Micronutrients such as selenium, copper, and zinc are essential in the diet or as supplements (Jalel et al., 2009).
Sesamin, an active lignan from sesame-oil stimulates melanogenesis (Jiang et al., 2011). Melanocortin hormone is important for pigmentation (Millington, 2006). Nicotine and tobacco-specific compounds may accumulate in tissues containing melanin and that this retention may affect melanin synthesis (Yerger & alone, 2006). Furocoumarin of Citrus is such a powerful photosensitizing agent which cause ‘phytophotodermatitis’ with skin eruption and hyperpigmentation (Weber et al., 1999). The coumarin derivative, scoparone (6, dimethoxycoumarin) is potent stimulator of melanogenesis by increasing enzyme activity as well as protein and mRNA expression of tyrosinase (Yang et al., 2006). Linear and angular-furocoumarins from the roots of Angelica dahurica, Angelica serrata, Coptotrygium incisum, Eracleum lanatum and C. candicans and the fruits of Cinidium monnieri and C. formosanum (Matsuda et al., 2005), Glycyrrhizin from Glycyrrhiza (Jung et al., 2001), psoralen with two other coumarins in carrots (Cesca et al., 1985) and the flavanone Naringenin from citrus (Ohguchi et al., 2006), histamine (Yoshida et al., 2000) and furocoumarins of lime oil and bitter-orange oil (Naganuma et al., 1985) and quercetin (Takeyama et al., 2004) are potent melanogenesis stimulators by inducing differentiation of melanoma cells (Brown et al., 1995). Based on the literature, it is concluded that, furocoumarins in Citrus limon, C. aurantium, Vitis vinifera etc., along with other vitamins and minerals of all the species of the present study may enhance the melanogenesis both directly and possibly also through immunomodulation and antioxidation, in patients with vitiligo or leucoderma.
Arthritis is a form of joint disorder that involves inflammation of one or more joints. Among more than 100 different forms of arthritis, osteoarthritis (degenerative joint disease), a result of trauma to the joint, infection of the joint, or age is the most common one. Other arthritis forms are rheumatoid arthritis, psoriatic arthritis, and related autoimmune diseases. Septic arthritis is caused by joint infection. General problem of arthritis is joint pain which is due to inflammation that occurs around the joint, damage to the joint from disease, daily wear and tear of joint, muscle strains caused by forceful movements against stiff, painful joints and fatigue. Treatment options vary depending on the type of arthritis and include physical therapy, lifestyle changes (including exercise and weight control), orthopedic bracing, and medications. Medications can help reduce inflammation in the joint which decreases pain.

Arthritis, an inflammation of the joints, is usually a chronic disease that results from dysregulation of pro-inflammatory cytokines (e.g. tumour necrosis factor and interleukin-1b) and pro-inflammatory enzymes that mediate the production of prostaglandins (e.g. cyclooxygenase-2) and leukotrienes (e.g. lipooxygenase), together with the expression of adhesion molecules and matrix metalloproteinases, and hyperproliferation of synovial fibroblasts. All of these factors are regulated by the activation of the transcription factor nuclear factor-kB. Numerous agents derived from plants can suppress these cell signaling
intermediates, including curcumin (from turmeric), resveratrol (red grapes, cranberries and peanuts), tea polyphenols, genistein (soy), quercetin (onions), silymarin (artichoke), guggulsterone (guggul), boswellic acid (salai guggul) and withanolides (ashwagandha). Indeed, several preclinical and clinical studies suggest that these agents have potential for arthritis treatment (Khanna et al., 2007). Currently, there is much attention directed toward the use of antioxidant vitamins, and of vitamin D, as a means of preventing or ameliorating the pain and disability of osteoarthritis. Vitamins A, C, and, D are the major antioxidants in the diet or in dietary supplement products that have been identified as having a potential for antioxidant activity in the processes associated with osteoarthritis.

The following vitamins are known to be beneficial to arthritis sufferers:

- Vitamin B5, B6 - are good for reducing swelling
- Vitamin B3 - reduces tissue swelling and dilates small arteries, increasing blood flow
- Vitamin B12 - aids in multiple functions. It helps with cell formation, digestion, myelin production, nerve protection
- Vitamin C - acts as an anti-inflammatory, relieving pain, and rids the body of free radicals
- Vitamin D - is a strong antioxidant that protects joints from free radicals while increases joint flexibility
- Vitamin E - is a strong antioxidant that protects joints from free radicals while increases joint flexibility
- Vitamin K - assists with mineral deposit into the bone matrix. Vitamins combine with enzymes involved with tissue repair, cell production and our metabolism (http://ezineArticles.com/25733). There are at least four possible pathways in which these nutrients can influence osteoarthritis: protection against oxidative damage, modulation of the inflammatory response, cellular differentiation, and
biologic actions related to bone and collagen synthesis (Sowers & Lachance, 1999). Arya et al. (2011) have enumerated about 30 antiarthritic plants. Sadique et al. (1996) have explained that anti-arthritis mechanism of Withania somnifera and Clerodendron inerme is the result in the formation of copper complexes in vivo.

In the diet schedule for the patients of Arthritis, in the present survey, Cocos nucifera is the dominant species followed by Citrus aurantium and Citrus limon. Along with the above two species, Ananas comosus, Carica papaya, Cucumis sativus, lusia paradisiaca and Vitis vinifera, rachis hypogea, Benincasa hispida are in the top ten species used to treat Arthritis (Table 1). Ghosh (2011) explained the antiarthritic potential of Bromelain from Ananas comosus and its combination. Anti-inflammatory activity in leaves of Carica papaya (Owoyele et al., 2008), fruits of Benincasa hispida (Rachchh et al., 2011) and neuroprotective effects of Citrus flavonoids (Hwang et al., 2012) have already been reported. In Brazil crude extract from husk fibers of coconut is used for variety of inflammatory diseases and it has been scientifically proved by Rinaldi et al. (2009). A diet high in oleic acid, which can be easily achieved through consumption of peanuts and olive oil, can have a negative effects of inflammatory cytokines observed in obesity and non insulin dependent diabetes mellitus (Vassiliou et al., 2009). The present diet therapy with rich antioxidants and vitamins along with several bioactive compounds are suitable to treat different kinds of arthritis.
**PARALYSIS**

Paralysis is loss of muscle function for one or more muscles. It may be accompanied by a loss of feeling (sensory loss) in the affected area if there is sensory damage as well as motor. A study conducted by the Christopher & Dana Reeve Foundation, suggests that about 1 in 50 people have been diagnosed with paralysis which is usually caused by damage in the nervous system, especially the spinal cord. Other major causes are stroke, trauma with nerve injury, poliomyelitis, amyotrophic lateral sclerosis (ALS), botulism, spina bifida, multiple sclerosis, and Guillain-Barré syndrome.

In one case study, magnetic resonance imaging (MRI) of the brain of a 4-month-old infant with neurological and hematological manifestations of vitamin B12 deficiency showed retarded myelination, most markedly in the frontal and temporal lobes of the brain, but also in the brainstem, cerebellum, and internal capsule and posterior areas of the hemispheres. A follow-up MRI, performed 5 months after initiation of vitamin therapy, revealed progressive myelination and significant regression of brain atrophy (Lovblad et al., 1997). A specific vitamin B complex (with and without folic acid) significantly improved symptoms of alcoholic polyneuropathy over a 12-week treatment period (Ceters et al., 2006).

Vitamin B₁₂ also called cobalamin, plays a key role in the normal functioning of the brain and nervous system, and for the formation of blood.
Vitamin B₁₂ deficiency or hypocobalaminemia can cause permanent damage to nervous tissue if left untreated long enough. Severe vitamin B₁₂ deficiency produces a cluster of neurological symptoms in infants, including irritability, failure to thrive, apathy, anorexia, and developmental regression, which respond remarkably rapidly to supplementation. The underlying mechanisms may involve delayed myelination or demyelination of nerves, alteration in the S-adenosylmethionine:S-adenosylhomocysteine ratio, imbalance of neurotrophic and neurotoxic cytokines, and/or accumulation of lactate in brain cells (Dror & Allen, 2008).

Recently, Green et al. (2011) first reported a case of unilateral vocal fold palsy secondary to vitamin B₁₂ deficiency. Central and peripheral neuropathies have been described; however, other than the optic nerve, the cranial nerves are very rarely affected. Aslam et al. (2004) described two CVID patients with the associated enteropathy who developed neurological disease because of vitamin deficiency. They have recommended that all CVID patients with evidence of an enteropathy be screened for vitamin deficiency, as early detection and consequent treatment may prevent, halt or reverse the neurological sequelae. Ataxia cerebellar dementia and leukoencephalopathy can result from vitamin B₁₂ deficiency. To limit the risks of sequelae, vitamin B₁₂ supplementation should be started at an early stage (Gochard et al., 2009).
Potassium-deficient rabbits usually developed a severe and rapidly progressing muscular dystrophy, with a closely associated creatinurea (Hove & Herndon, 1955). A distinct clinical syndrome of combined vitamin E and vitamin C deficiency occurs in guinea pigs. This syndrome indicates that these antioxidant vitamins are related \textit{in vivo} (Hill \textit{et al}., 2003). Low phosphorous level in the blood of paralytic buffaloes suggested that hypophosphataemia may be the main causal factor of the observed paralytic syndrome in the buffaloes (Habib \textit{et al}., 2004).

Glutamate is related to its essential role as a neurotransmitter. The levels of glutamate in the central nervous system (brain and spinal cord) are highly regulated, since the neurons have sensitive receptors for the compound. In some neurological diseases, it is found that glutamate levels in the central nervous system become unusually high at sites of pathology. This can occur, for example, if the rate of degradation of glutamate is slowed by an impairment of the enzymes that are involved. Also, glutamate is excreted by immune cells that take part in inflammatory processes—the result is high local concentrations at the neurons in progressive neurological diseases such as S and ALS. Glutamate levels in the central nervous system can also increase when the blood brain barrier is substantially weakened, as occurs after neurological surgery. The excess glutamate at the neuron acts as a poison at high enough levels, the nerves
exposed to glutamate can be completely and permanently damaged, so that they are no longer capable of transmitting signals. Thus, while glutamate is a major component of the body, and an essential part of the nervous system, high levels localized in the nerve cells can be quite toxic, and this is readily demonstrated in animal models. Plasma ammonia levels above 2 mmol, in arctic char, results in flaccid paralysis (Lumsden et al. 1993). In contrast, blood ammonia levels greater than 0.0  mmol can be toxic to the central nervous system of most mammals (Meijer et al. 1990).

Paralysis is one of those diseases which need quick treatment and care. Minor paralysis can be cured easily, but the major ones need more time to be cured. In Ayurveda Ashwagandha commonly known as Winter Cherry is used to cure paralysis. Bala known as Country Mallow is also considered as an effective herb for the treatment of paralysis. Apart from this, some therapies involve application of medicated oils in the affected regions (http://www.damthemovie.com/ayurveda-cure-paralysis.php).

The following species have been identified as top 10 plant species in the diet schedule (Table 19) of the present survey: Citrus limon, Cocos nucifera, Carica papaya, Carica papaya, Psidium guajava, Vitis vinifera, Citrus aurantium, Aegle marmelos, Alternanthera sessilis and Ananas comosus.
From the brief survey of literature as seen above, vitamin B12 is very important to maintain healthy neurons. But they are not synthesized by plants. Several bacteria synthesize vitamin B12. The human small intestine also often harbours a considerable microflora and this is even more extensive in apparently healthy southern Indian subjects (Bhat et al., 1972). Albert et al. (1980) showed that at least two groups of organisms in the small bowel, *Pseudomonas* and *Klebsiella sp.*, may synthesize significant amounts of the vitamin. Animal foods like, meat, fish, egg, milk etc are the main source of vitamin B12. They are synthesized by several kinds of bacteria present in the gut flora of animals. Microflora on plants also synthesizes vitamin B12. It is for this reason that some batches of beans, bean sprouts, comfrey leaves, turnip greens, peanuts, lettuce, fermented soybeans, and whole wheat have been reported to contain significant amounts of B12. The presence of bacteria on such foods is incidental. In the present survey the patients of several cases, particularly in paralytic patients, are advised to take sprouted food items like *Phaseolus aureus*, *Cicer arietinum*, *Arachis hypogea*, *Vigna unguiculata*, *Pisum sativum*, *Pennisetum glaucum* and *Triticum aestivum* as breakfast (Table 19).

Hyperammonemia refers to a clinical condition associated with elevated ammonia levels manifested by a variety of symptoms and signs, including significant central nervous system (CNS) abnormalities. Ammonia is a neurotoxin that predominantly affects astrocytes. Ammonia induces the mitochondrial permeability transition in cultured astrocytes. Oxidative stress and glutamine play
major roles in the induction of the mitochondrial permeability transition associated with ammonia neurotoxicity. Treatment of astrocytes with the mitochondrial glutaminase inhibitor, 6-diazo-5-oxo-L-norleucine, completely blocked free radical formation and the mitochondrial permeability transition (Norenberg et al., 2004).

N-carbamoyl-L-glutamate plus L-arginine can be used in the prevention and treatment of hyperammonemia (Kim et al., 1972). The Ayurvedic herb, *Hibiscus sabdariffa* also affects Ammonium Chloride-Induced Hyperammonemic Rats (Essa & Subramanian, 2007). *Semecarpus anacardium* shows antihyperammonemic, hepatoprotective, neuroprotective and antioxidant activities against NH₄Cl-induced hyperammonemia (Vijayakumar & Subramanian, 2004). The flavonoid, morin by oral administration offers protection against hyperammonemia by means of reducing blood ammonia, oxidative stress and enhancing antioxidant status in hyperammonemic rats (Subash & Subramanian, 2009). Pineapple, *Ananas comosus* peel has protective effect against alcohol-induced oxidative stress in brain tissues (Erukainure et al., 2011). All the fruits and vegetables along with other pulses and cereals, with rich vitamins, minerals and antioxidants, may remove the neurotoxins from the body and may strengthen the nerve cells in paralytic persons.
18. EPILEPSY

Epilepsy is a common and diverse set of chronic neurological disorders characterized by seizures. An epileptic seizure, occasionally referred to as a fit, is defined as a transient symptom of "abnormal excessive or synchronous neuronal activity in the brain" (Fisher et al., 2005). It results in convulsion in which the body muscles contract and relax rapidly and repeatedly, resulting in an uncontrolled shaking of the body. Current therapies for epilepsy are largely symptomatic and are aimed at controlling seizures in affected individuals. Shin and McNamara (1994) reviewed the mechanisms underlying the most common form of epilepsy—complex partial epilepsy—and also addressed progress in molecular-genetic approaches. Based on a single study on the incidence of epilepsy, the number of new cases of epilepsy each year would be close to half a million (Sridharan & Murthy, 1999).

Nonpharmacological treatment of epilepsy includes surgery, vagal nerve stimulation, ketogenic diet, and other alternative/complementary therapies, e.g., yoga. Ketogenic diet is a safe and effective treatment for intractable epilepsies; it has been recommended since 1921. The diet induces ketosis, which may control seizures (Saxena & Nadkarni, 2011). Reetesh et al. (2011) have given an account on anti-epileptic medicinal plants. Vyawahare et al., (2007) have also discussed about 18 anticonvulsant herbs including *Ficus religiosa* and *Benincasa hispida*. Anticonvulsant herbal drugs have the least negative drug interactions and side effects (Pandey et al., 2012).
The ketogenic diet is a high-fat, adequate-protein, low-carbohydrate diet that in medicine is used primarily to treat difficult-to-control (refractory) epilepsy in children. The diet mimics aspects of starvation by forcing the body to burn fats rather than carbohydrates. Normally, the carbohydrates contained in food are converted into glucose, which is then transported around the body and is particularly important in fuelling brain function. However, if there is very little carbohydrate in the diet, the liver converts fat into fatty acids and ketone bodies. The ketone bodies pass into the brain and replace glucose as an energy source. An elevated level of ketone bodies in the blood, a state known as ketosis, leads to a reduction in the frequency of epileptic seizures (Freeman et al., 2007).

Bromide is the first effective antiepileptic agent (Pearce, 2002). Established antiepileptic drugs (AEDs) decrease membrane excitability by interacting with neurotransmitter receptors or ion channels. AEDs developed before 1980 appear to act on sodium channels, gamma-aminobutyric acid type A (GABAA) receptors, or calcium channels. Benzodiazepines and barbiturates enhance GABAA receptor-mediated inhibition (Macdonald & Kelly, 1995).

The dietary schedule of the present survey to treat epilepsy (Table 20) includes Musa paradisiaca, Carica papaya, Citrus limon, Cocos nucifera, Ficus carica, Psidium guajava, Vitis vinifera, Arachis hypogea, Centella asiatica and Cicer arietinum as top ten species.
As in several other diseases, including neuropathy, vitamins play an important role in development and function of the brain and the vitamin deficiency, particularly during the developmental stages of the brain from the embryo till childhood, will result in several neuropathic problems in connection with the brain. There was an unusual presentation of vitamin B12 deficiency—recurrent seizures in a 26-year-old man (Kumar, 2004). His symptoms responded to parenteral vitamin B12 therapy. Antiepileptics in addition to Vitamin B12 resulted in disappearance of seizures within a few days or weeks; electroencephalographic findings were normalized in a few months (Benbir, et al., 2007). It appears that thiamine deficiency may provoke epileptic phenomena in those patients who have subclinical predisposition for seizures (Keyser & De Bruijn, 1991). A five month old black infant with generalized seizures was found to have severe vitamin deficiency and hypocacemia. His mother had not taken any vitamin or nutritional supplements during pregnancy or lactation (Wallis, 2008).

Neuronal hyperexcitability and excessive production of free radicals have been implicated in the pathogenesis of a considerable range of neurological disorders, including epilepsy. The experimental and clinical data suggest a putative role of oxidative stress in the pathophysiology of certain seizure types. The pro-oxidant/antioxidant balance is not only modulated by seizures per se, but also by antiepileptic drugs.
The ability of antioxidants for reducing the seizure manifestations further supports a role of free radicals in seizures and highlights a possible role of antioxidants as adjuncts to antiepileptic drugs for better seizure control (Devi et al., 2008). The biological effects of free radicals are controlled in vivo by a wide range of antioxidants, such as alpha-tocopherol, ascorbic acid, vitamin A, and glutathione reduced (Halliwell and Gutteridge, 1990; Ayyildiz et al., 2006). Acid ascorbic and alpha-tocopherol have many functions in the brain and in the neuronal microenvironment. They work as neuromodulators as well as antioxidant/free radical scavengers (Koza et al., 2007; Devi et al., 2008). It has been suggested that ascorbic acid and alpha-tocopherol have neuroprotective properties including seizure activity induced by pilocarpine (Gaby, 2007; Barros et al., 2007).

The naturopathic treatment of epilepsy in the present survey shows the main trend in providing antioxidants, vitamins and other essential nutrients to strengthen the brain, particularly by relieving it from oxidative stress. Anticonvulsant and neuroprotective activity of Centella asiatica, one of the top ten species of the present survey, has been confirmed in male Wistar rats (Visweswari et al., 2010). Gupta et al., (2003) suggested that the potential of aqueous extract of Centella asiatica as adjunct to antiepileptic drugs with an added advantage of preventing cognitive impairment.
A psychological disorder, also known as a mental disorder, is a pattern of behavioral or psychological symptoms that impact multiple life areas and/or create distress for the person experiencing these symptoms. Personality disorder Prevention and/or Curing Protocol is for people who are ready to take the full responsibility for their own health. "The person who says it cannot be done should not interrupt the person doing it." Chinese Proverb.

Western medicine treats depression and anxiety as symptoms of abnormal brain chemistry. By altering the neural chemistry, modern drugs mimic our sense of normalcy and, to a certain extent, can be effective in the management of mental illness. Traditional Chinese Medicine, on the other hand, views depression as a chest problem. Unrelieved, it can also lead to a feeling of agitation in the chest known as heat in the heart. This condition is usually diagnosed as anxiety, insomnia, tachycardia, or panic disorder. Some heart arrhythmias, and many forms of psychosis have their origins here. All these disorders are actually qi disorders, and therefore physical. That’s why some of the most effective ways to relieve do not involve talking or counseling. Depression and anxiety can be instantly relieved by vigorously moving the qi of the chest. Push-ups work as well as Prozac. More relief can come from boxing, breathing exercises, yoga techniques, massage, and forceful crying and wailing, all of which can release the qi of the chest. Herbs can also be used to promote the circulation of qi in the chest and to clear heat.
from the heart. Herbs used to relieve depression and anxiety generally move theLiver Qi (Qi of the chest). Taken alone, these herbs may have only a mild effect. In certain combinations, however, the results can be quite powerful. Hare’s ear root, also known as chai hu, or bupleurum, is the best known of these herbs. It strongly moves the Qi of the chest (Liver Qi). Its ability to do this is further enhanced by combining it with a small amount of ordinary mint (bo he). Other herbs that move the liver Qi include immature tangerine peel qing pi, cyprus xiang fu, Chinese rose mei gui hua, white peony root bai shao, caltrop fruit bai ji li, and bitter orange zhi shi. (http://www.drshen.com/chineseherbsforthemind.htm).

In the present study the following vegetables and fruits are used to treat various kinds of psychological disorders (Table 21):

- Aegle marmelos
- Carica papaya
- Citrullus lanatus
- Citrus aurantium
- Citrus limon
- Cocos nucifera
- Cucumis melo
- Cucumis sativus
- Daucus carota
- Eclipta prostrata
- Ficus carica
- Lycopersicon esculentum
- Musa paradisiaca
- Emblica officinalis
- Piper nigrum
- Psidium guajava
- Trichosanthes anguiana
- Vitis vinifera

The effects of peppermint oil and eucalyptus oil preparations on neurophysiological, psychological and experimental algesimetric parameters were investigated in 32 healthy subjects in a double-blind, placebo-controlled, randomized cross-over design. Four different test preparations were applied to large areas of the forehead and temples using a small sponge and their effect was
evaluated by comparing baseline and treatment measure. The combination of peppermint oil, eucalyptus oil and ethanol increased cognitive performance and had a muscle-relaxing and mentally relaxing effect, but had little influence on pain sensitivity. A significant analgesic effect with a reduction in sensitivity to headache was produced by a combination of peppermint oil and ethanol. The essential plant oil preparations often used in empiric medicine can thus be shown by laboratory tests to exert significant effects on mechanisms associated with the pathophysiology of headache (Göbel et al., 1994).

Ng et al. (2008) examined the current evidence for the role of oxidative stress in psychiatric disorders, and its academic and clinical implications. These data not only suggest that oxidative mechanisms may form unifying common pathogenic pathways in psychiatric disorders, but also introduce new targets for the development of therapeutic interventions (Ng et al., 2008).

The diet schedule of the present survey mainly includes several fruits and vegetables with potent antioxidants. Thus by providing good atmosphere for the brain without any oxidative stress, the brain may function normally.
Neuropathy is a collection of disorders that occurs when nerves of the peripheral nervous system are damaged. The condition is generally referred to as peripheral neuropathy, and it is most commonly due to damage to nerve axons. Neuropathy usually causes pain and numbness in the hands and feet. It can result from traumatic injuries, infections, metabolic disorders, and exposure to toxins. One of the most common causes of neuropathy is diabetes. The four cardinal patterns of peripheral neuropathy are polyneuropathy, mononeuropathy, mononeuritis multiplex and autonomic neuropathy. The most common form is (symmetrical) peripheral polyneuropathy, which mainly affects the feet and legs. Neuropathy may be associated with varying combinations of weakness, autonomic changes, and sensory changes. Loss of muscle bulk or fasciculations, a particular fine twitching of muscle, may be seen. About 30% of neuropathy cases are considered idiopathic, which means they are of unknown cause. Another 30% of neuropathies are due to diabetes. In fact, about 50% of people with diabetes develop some type of neuropathy. The remaining cases of neuropathy, called acquired neuropathies, have several possible causes, including vitamin deficiencies. Several antidepressive drugs, particularly alkaloid groups, are being commonly used to treat several neuropathic disorders. There are two dietary supplements that have clinical evidence showing them to be effective treatments of diabetic neuropathy; alpha lipoic acid and benfotiamine (Head, 2006).
In the present survey, the diet schedule (Table 22) used for Neuropathy, includes *Vitis vinifera, Carica papaya, Musa paradisiaca, Cocos nucifera, Citrus limon, Citrus aurantium, Vigna unguiculata, Crici
ticum aestivum, Trichosanthes anguiana* and *Solanum torvum*.

Vitamin therapies can be beneficial in the treatment of many forms of peripheral neuropathy. The use of alkaloid groups of pain killer is only of temporary relief. So the strengthening of damaged and weakened nerves by various vitamins and minerals is the permanent way of treatment of neuropathy. Dietary antioxidants are potential candidates for use in the intervention of neurodegenerative diseases. The top ten plant species, with several kinds of vitamins and minerals at high concentration, listed from the present survey shows such trend to treat neuropathy. For example, papayas offer a good source of magnesium which helps to relax the nerves and muscles, build and strengthen bones and keep the blood circulation running smoothly. Papayas are also rich in potassium which is needed to help your muscles and nerves to function properly, and to maintain acid balance of the body. Potassium can also help lower the risk of high blood pressure (http://veganqi.com/fruit/papaya). Papaya epicarp extract acts as a potent free radical scavenger and provided neuroprotection against \( H_2O_2 \)-induced oxidative stress. Papaya epicarp extract ameliorated glutathione depletion, restored total antioxidant capacity and augmented the inhibition of antioxidant enzymes (catalase, glutathione peroxidases and superoxide dismutase).
(Guizani et al., 2011). In the same way, banana is rich in potassium and iron, which are useful for people with heart problems or anemia. Different enzymes of banana promote absorption of carbohydrates, improve mental functioning, strengthen nervous system, and increase resistance to stress. Neuroprotective role of vitamin E against cisplatin peripheral neurotoxicity with significant reduction of the relative risk of developing signs or symptoms of neurotoxicity, has been reported by Pace et al., (2010). Ergocalciferol, the plant-derived form of vitamin D potentiates axon regeneration (Chabas et al., 2008).

In the present survey two species of Citrus (C. limon and C. aurantium) are in the top ten plants for the treatment of neuropathy. Hwang et al. (2012) recently discussed the bioactivity, multiple neuroprotection mechanisms, and antioxidant and signaling properties of citrus flavonoids. Receptor-mediated neuroprotective actions and parallel signaling pathways are also explored. Finally, the induction of cellular defense proteins against oxidative stress and neurotoxicity by hesperitins, a main and widespread citrus flavonoid, are also discussed. It is suggested that citrus fruits, which are rich in abundant sources of hesperetin and other flavonoids, are promising for the development of general food-based neuroprotection and brain foods.
Water extract of *Triticum aestivum* and some of its components can be used as a medicinal material for the development of neuroprotective agents against vascular dementia. In the extract, arabinose effectively inhibited the myelin basic protein and glial fibrillary acidic protein change, whereas arabinoxylan inhibited the glial fibrillary acidic protein change only (Han et al., 2010, Jang et al., 2010). Cultivated and wild species of *Vigna unguiculata* (L.) Walp. (Cowpea), which is one of the top ten species in the present study, show presence of three endogenous flavonoid aglycons: quercetin, kaempferol, and isorhamnetin (Lattanzio et al., 2000) which are considered as bioactive compounds in several cases including neuroprotection (Calderon-Montaño et al., 2011). An isoflavone glycoside; 5,6,6'-trimethoxy-3',4'-methylenedioxyisoflavone 7-β-D-(2''-O-p-coumaroylglucopyranoside), has been characterized from the seeds of *Tricosanthes anguina* (Yadava & Syeda, 1994). Compounds like neochlorogenin, solagenin, isoquercetin, rutin, kaempferon and quercetin have been reported from *Cohnum torium* (Mahmood et al., 1983). Some degenerative diseases of the nervous system have been linked to hormonal imbalance in postmenopausal women. Young coconut juice has some estrogen-like characteristics with neuroprotective effects. The number of neurons increases considerably in rats treated with young coconut juice (Radenahmad et al., 2009).
21. INFERTILITY

Infertility primarily refers to the biological inability of a person to contribute to conception (Makar & Toth, 2002). Infertility may also refer to the state of a woman who is unable to carry a pregnancy to full term. There are many biological causes of infertility, some which may be bypassed with medical intervention. The WHO defines infertility as follows: Infertility is the inability to conceive a child. A couple may be considered infertile if, after two years of regular sexual intercourse, without contraception, the woman has not become pregnant (and there is no other reason, such as breastfeeding or postpartum amenorrhoea). Primary infertility is failure to conceive following a previous pregnancy. Infertility may be caused by infection on in the man or woman, but often there is no obvious underlying cause.

The rising prevalence of obesity, which is of common health problem, has had a profound impact on female reproductive health. Increased body mass index (BMI) is associated with ovulatory sub-fertility and anovulatory infertility. Weight loss regularizes menstrual cycles and increases the chance of spontaneous ovulation and conception in anovulatory overweight and obese women. Gradual sustained weight loss is beneficial whereas crash dieting is detrimental (Pandey et al., 2010).
Ried and Stuart (2011), based on a review, suggests that management of female infertility with Chinese Herbal Medicine can improve pregnancy rates 2-fold within a 4-month period compared with Western Medical fertility drug therapy. Assessment of the quality of the menstrual cycle, integral to TCM diagnosis, appears to be fundamental to successful treatment of female infertility.

Oxidative stress (OS) has been recognized as one of the most important cause of male infertility. Despite the antioxidant activity of seminal plasma, epididymis and spermatozoa, OS damages sperm function and DNA integrity. Since antioxidants suppress the action of reactive oxygen species, these compounds have been used in the medical treatment of male infertility. Taking into account the pros and the cons of antioxidant treatment of male infertility, the potential advantages that it offers cannot be ignored. Antioxidant therapy should remain in the forefront of preventive medicine, including human reproductive medicine (Lanzafame et al., 2009). The process of spermatogenesis is under strict endocrine control and the oxidative stress has also been implicated in male infertility. A total of 37 individual herbs and seven herb decoctions used in the treatment of male factor infertility showed that individual herbs tested did not show androgenic properties, 20 showed strong and 10 weak anti-oestrogenic activities (Tempest et al., 2008).
The treatment of an inflammatory process by the synergic action of immune modulators and anti-oxidants could protect sperm during maturation and migration, leading to improved sperm function (Piomboni et al., 2008). Sapota juice of the present study, revealed the presence of rich sugars, proteins, ascorbic acid, phenolics, carotenoids and minerals like iron, copper, zinc, calcium and potassium. Apart from the nutritional components just given, sapota juice showed potential antioxidant activity against 1,1-diphenyl-2-picrylhydrazyl free radicals and superoxide radicals (Kulkarni, et al., 2007).

In the present study, among various plants in the dietary schedule, *Cocos nucifera*, *Malus sylvestris*, *Phoe- nix dactylifera*, *Achras sapota*, *Aegle marmelos*, *Carica papaya*, *Vitis vinifera*, *Ara-chis hypogea*, *Centella asiatica* and *Cicer arietinum* are the dominantly used top ten species to cure infertility problems (Table 23). As in several other cases these are also potential antioxidants which mainly remove the morbid matters from the body and thus revoke the whole body, including the reproductive system, to function normally. It is evident that, of 5 infertile couple who were found to be clinically anaemic, after treating them with dietary supplements (Vitamin B12 and folic acid and Iron), 4 out of 5 couples conceived between 4 months and 1 year of treatment (Singh et al., 2000). Thus from various studies it is understood that one cannot build a strong house on a plot without a required level of foundation. In the same way human beings with weak and unhealthy body will have several fertility-complications which can be rectified easily by proper diet therapy as in naturopathy.
22. MENSTRUAL DISORDERS

A menstrual disorder is an irregular condition in a woman's menstrual cycle. Infrequent or irregular ovulation (usually defined as cycles of \( \geq 36 \) days or \(< 8 \) cycles a year) is called oligoovulation. Anovulation is absence of ovulation when it would be normally expected (in a post-menarchal, premenopausal woman). Anovulation usually manifests itself as irregularity of menstrual periods, that is, unpredictable variability of intervals, duration, or bleeding. Anovulation can also cause cessation of periods (secondary amenorrhea) or excessive bleeding (dysfunctional uterine bleeding). *Polymenorrhea* is the medical term for cycles with intervals of 21 days or fewer. *Irregular menstruation* is where there is variation in menstrual cycle length of more than approximately eight days for a woman. The term *metrorrhagia* is often used for irregular menstruation that occurs between the expected menstrual periods. Amenorrhea and oligomenorrhea (lack of bleeding or too little bleeding), Dysmenorrhea (painful menstruation) and Menorrhagia (excessive bleeding) are also common menstrual disorders.

Making dietary adjustments starting about 14 days before a period may help some women with certain mild menstrual disorders, such as cramping. Traditional remedies are part of the cultural and religious life of the African people. A wide spectrum of herbal traditional remedies are used to regulate the menstrual cycle, enhance fertility and as either abortifacients or antiabortifacients.
(Steenkamp, 2003). In Brazil, Cuba, India, Panama and Peru the bitter melon,
*Momordica charantia* is used to cure variety of diseases/disorders including
menstrual problems (http://rainforest-database.com/plants/bitmelon.htm).

It has been accepted that food customs are closely associated with quality
of life in women of the reproductive age. Food customs are speculated to not only
influence the present life style but also to induce gynecological disorders such as
dysmenorrhea and irregular menstruation. Nutritional deficiency is considered
one of the important factors that induce hypothalamic-pituitary-ovarian
dysfunction. It is well known that excess weight and obesity are associated with
irregular menstrual cycles, which reduce fertility and increase hormone-sensitive
cancers in young women (Kirschner, 1982 & Pasquali, 2003). On the other hand,
several studies reported that vitamin deficiency or hypoglycemia can induce
premenstrual syndrome in which patients complain of irritability, constipation
and edema several days before the onset of menstruation (Bendich, 2000). It was
also reported that deficiency of vitamin B1 and magnesium may cause
dysmenorrhea, suggesting supplementation of these agents can relieve menstrual
symptoms (Bendich, 2000). Very recently, it has been confirmed that the
frequency of irregular menstruation was increased in young women who were
currently on a diet and found that the intensity of dysmenorrheal was high in those
with a history of dieting in adolescence, suggesting that diet in adolescence has
long-lasting adverse effects on reproductive function in young women (Fujiwara, 2007, Fujiwara et al., 2007). *Lycium*, *Nux vomica*, *Sepia*, *Calophyllum* etc. are used in Homeopathy to cure various menstrual disorders (Herbs2000.com). These findings notably warn of the possibility that diet limitation in adolescence becomes a trigger for the subsequent development of organic gynecologic diseases, supporting the concept that inadequate dietary habits may influence women’s QOL not only in the present but also in the future.

In the present study, diet therapy is given in naturopathy (Table 24) to revive normal menstrual cycle in women. It includes mainly different kinds of fruits and vegetables such as, *Ananas comosus*, *Benincasa hispida*, *Beta vulgaris*, *Carica papaya*, *Cassia auriculata*, *Centella asiatica*, *Citrus aurantium*, *Citrus limon*, *Coconut*, *Cucumber*, *Daucus carota*, *Eugenia jambolana*, *Ficus carica*, *Luffa acutangula*, *Lycopersicum esculentum*, *Murraya koenigii*, *Musa paradisiaca*, *Oryza sativa*, *Phoenix dactylifera*, *Emblica officinalis*, *Piper nigrum*, *Psidium guajava*, *Punica granatum* and *Vitis vinifera*.
Human immunodeficiency virus (HIV) infection is now recognized as a chronic illness. Of over one billion inhabitants of India, it's estimated that around 2.4 million people are currently living with HIV. Antiretroviral drugs (ARVs), which can significantly delay the progression from HIV to AIDS – have been available in developed countries since 1996 (http://www.avert.org/aidsindia.htm). Recently, Desai et al. (2012) discussed the challenges associated with HIV-1 treatment and updates several major advances in the development of ARVs. The current therapy finds its limitations in the emergence of multidrug resistance, transmission of drug-resistant HIV strains, and a life-long treatment. Finding novel drug targets and new drugs is the need of the hour to treat the infected persons (Kumari & Singh, 2012).

Anti-HIV-1 compounds have been isolated from the medicinal plant Rhus chinensis (Wang et al., 2008). Out of 92 extracts from 23 plants of India, nine extracts of 8 different plants significantly reduced viral production in CEM-GFP cells infected with HIV-1NL4.3. Egle marmelos, Argemone mexicana, Asparagus racemosus, Coleus forskohlii, and Rubia cordifolia demonstrated promising anti-HIV potential and were investigated for their active principles (Sabde et al., 2011). Two indigenous herbs of Zimbabwe, Musakavakadzi and Peltoforum africanum reduced the occurrence of adverse drug events (Mudzviti et al., 2012).
In the present survey (Table 25) of naturopathic treatment of HIV-infection, *Vitis vinifera*, *Carica papaya*, *Citrus limon*, *Cocos nucifera*, *Musa paradisiaca*, *Punica granatum*, *Citrus aurantium*, *Cucumis limon*, *Daucus carota* and *Mangifera indica* are in the top ten species list.

Unguinil from *Vigna unguiculata* is capable of inhibiting Human Immunodeficiency Virus-1 reverse transcriptase and the glycohydrolases a- and beta-glucosidases which are involved in HIV infection (Ye & Ng, 2001). The methanol extract from *Jatropha curcas* was found to produce a moderate cytoprotective effect against HIV in cultured human lymphoblastoid CEM-SS cells (Muanza et al., 1995). Immune enhancement through the use of natural products is a potentially valuable therapeutic modality in HIV-infected people, especially those who are not good candidates for aggressive ARV therapy. Immune Assist 24/7™ from mushroom, used as a sole therapeutic agent without additional ARV drugs, significantly increased CD4+ T-lymphocyte populations in all of the HIV patients (Adotey et al., 2011).

Decreased concentrations of 1alpha, 25-hydroxyvitamin D3, or 1,25(OH)2D, the active form of vitamin D, have been reported among HIV-infected people. An inverse association between 1,25(OH)2D concentrations and mortality has been reported from a small cohort of HIV-infected adults, and some cross-sectional studies have indicated positive correlations between 1,25(OH)2D and CD4+ cell counts (Villamor, 2006).
An anthelminthic agent, levamisole, also known as a potent immunomodulator, has been successfully used for adjuvant therapy of malignancies and chronic infections, including HIV infection (Bourinbaiar et al., 2009). Dr. Garewal and coworkers found that high levels of β-carotene given as a supplement to AIDS patients increased the level of activated lymphocytes. Similarly, in an animal model of retroviral-induced immune depression, Dr. Watson and coworkers found that a carotenoid increased resistance to tumor growth that had been enhanced by infection (Watson, 1992).

Low levels of vitamin A, vitamin B₁₂, zinc, and selenium are common and have been demonstrated to be associated with disease progression and HIV-1 related mortality, independent of CD4 count <200 cells/mm³ at baseline and CD4 count over time. The profound effect of selenium on disease progression may reflect selenium's action in antioxidant defense systems, as well as gene regulation (Marianna, 2000). Gill and Walker (2008) described the nature of selenoproteins, sources of Selenium in diets and the known mechanisms by which Selenoproteins regulate redox balance, augment immune function and mediate resistance to viral infections. Some of the nutritional and antioxidant supplements that have been used in the treatment and prevention of AIDS are: vitamin A and carotenoids, vitamin C, vitamin E, selenium, n-acetyl cisteine, l-gluthamin, zinc, cooper, manganese, alphalipoic acid, coenzyme Q10, B-complex vitamins, and flavonoids or vitamin P (Giraldo, 2002).
As in other cases, the present survey shows mainly the improvement of immunity by providing balanced nutrients and antioxidants, along with antiviral compounds, for the treatment of HIV-AIDS. As mentioned above, the naturopathy treatment will also decrease the side effects of Anti HIV drugs. Pomegranate is an important fruit used in the present survey. HIV-1 entry inhibitors in pomegranate juice adsorb onto corn starch and the resulting complex blocks virus binding to CD4 and CXCR4/CCR5 and inhibits infection by primary virus clades A to G and group O (Neurath et al., 2005). Pomegranate shows the presence of about forty different kinds of tannins (Wang et al., 2010). Punicalin from bark, leaf and pericarp, Punicacortein A-D from bark of Pomegranate show Anti-HIV activity (Tanaka et al., 1986). Casuarinin from pericarp is with antioxidant and antiviral activities (Satomi et al., 1993). About thirty different kinds of antioxidant flavonoids, and about 10 different bioactive alkaloids have also been reported from different parts of pomegranate. Antiviral nutraceuticals from Pomegranate juice are also present (Kotwal, 2009). *Mangifera indica* possesses antidiabetic, anti-oxidant, anti-viral, anti-HIV, antispasmodic, antipyretic, anti diarrhoeal, antiallergic, immunomodulation, hypolipidemic, anti microbial, hepatoprotective and gastroprotective effects (Shah et al., 2010). Most of the other top ten species like *Carica papaya*, *Citrus limon*, *C. aurantium*, *Daucus carota*, *Musa paradisiaca*, *Vitis vinifera* etc are with various kinds of vitamins and antioxidant agents which are very important for the improvement of immunity of the HIV infected persons.
Cancer is a broad group of various diseases, all involving unregulated cell growth. In cancer, cells divide and grow uncontrollably, forming malignant tumors, and invade nearby parts of the body. The cancer may also spread to more distant parts of the body through the lymphatic system or bloodstream. Not all tumors are cancerous. There are several causes for cancer. Both hereditary and environmental factors are important causative factors of cancer. Carcinogens, both natural and artificial, in foods are major causative factor for cancer.

It has been estimated that 30-40 percent of all cancers can be prevented by lifestyle and dietary measures alone. Obesity, nutrient sparse foods such as concentrated sugars and refined flour products that contribute to impaired glucose metabolism (which leads to diabetes), low fiber intake, consumption of red meat, and imbalance of omega 3 and omega 6 fats all contribute to excess cancer risk. Intake of flax seed, especially its lignan fraction, and abundant portions of fruits and vegetables will lower cancer risk. *Allium* and cruciferous vegetables are especially beneficial, with broccoli sprouts being the densest source of sulforophane. Protective elements in a cancer prevention diet include selenium, folic acid, vitamin B-12, vitamin D, chlorophyll, and antioxidants such as the carotenoids (alpha-carotene, beta-carotene, lycopene, lutein, cryptoxanthin). Ascorbic acid has limited benefits orally, but could be very beneficial intravenously. Supplementary use of oral digestive enzymes and probiotics also
has merit as anticancer dietary measures. When a diet is compiled according to the guidelines it is likely that there would be at least a 60-70 percent decrease in breast, colorectal, and prostate cancers, and even a 40-50 percent decrease in lung cancer, along with similar reductions in cancers at other sites. Such a diet would be conducive to preventing cancer and would favor recovery from cancer as well (Donaldson, 2004).

Cocos nucifera, Mus paradisiaca, Triticum aestivum, Citrus limon, Cynodon dactylon, Eclipta prostrata, Solanum nigrum, Terminalia chebula and Vitis vinifera are the top ten species included in the diet schedule of the present survey to treat cancer (Table 26).

The role of diet in breast cancer has been considered since the 1940s. Although dietary fat, estrogenic food additives, and alcohol increase the risk of breast cancer, fiber, indoles, flavonols, vitamins C and E, beta carotene, and selenium are associated with a decreased risk. Mechanistically, higher serum levels of estrogen have been linked with risk of breast cancer. Dietary fat, insecticide residues, and alcohol result in higher estrogen activity. A variety of plant nutrients have estrogen-blocking activity. Current evidence justifies recommending that women of all ages follow a plant-based diet in which fat provides no more than 10% of calories, with the goals of preventing breast cancer and improving its prognosis in a low-cost, safe manner (Nicholson, 1996).
Monoterpenes are gaining significant importance as major ingredients of functional food and constituents of prophylactic formulations due to their ability to stabilize the symptoms of chronic diseases including cancer. The citrus monoterpenes have shown inhibition of human cancer cells proliferation and tumors growth through various mechanisms such as, induction of detoxifying phase-II enzymes, altering the genes responsible for activation apoptosis, inhibition of growth proteins, cell cycle arrest and inhibition of hormonal activities. The advantage of D-limonene is that the metabolites are also found to be effective inhibitors of cancer cells. The major active metabolites of D-limonene, perillyl alcohol, perilllic acid and limonene 1, 2-diol are known for the inhibition of human colon, breast and prostate cancer cells. Research carried out by Murthy et al. (2012) has demonstrated that volatile oil isolated from *Citrus aurantifolia* and *Citrus sinensis* (rich in D-limonene and D-dihydrocarvone) is capable of inhibiting proliferation of human colon cancer cells by inducing apoptosis and inhibition of angiogenesis, a potential target for cancer chemoprevention.

It has been reported that hydro-alcoholic extracts of five Ayurvedic medicinal plants, pericarp of *Terminalia chebula*, rhizome of *Acorus calamus*, stem bark of *Bauhinia variegata*, whole plant of *Phyllanthus amarus*, root of *Glycyrrhiza glabra* evaluated for their antiproliferative activity on fourteen cancer cell lines, four extracts except *Glycyrrhiza glabra* were found active against prostate cancer cell line (DU145. In addition to this *Terminalia chebula* exhibited activity against leukemia cancer cell line (K562) (Gaidhani et al., 2009).
In the present study, *Terminalia chebula* is a major anticancer agent. Another herb of the present study, *Eclipta prostrata* has also been proved for its anticancer activity by the presence of a kind of saponins (Khanna & Kannabiran, 2009).

Anticancer property of *Solanum nigrum* of the present survey has also been reported. *Solanum nigrum* leaves contained the highest concentration of gentisic acid, luteolin, apigenin, kaempferol, and *m*-coumaric acid. However, the anthocyanidin existed only in the purple fruits. The cytotoxic effect of *Solanum nigrum* leaf extract on AU565 cells that was mediated via two different mechanisms depending on the exposure concentrations. A low dose of leaf extract induced autophagy but not apoptosis. Higher doses (>100 μg/mL) of leaf extract could inhibit the level of p-Akt and cause cell death due to the induction of autophagy and apoptosis. However, these findings indicate that leaf extract induced cell death in breast cells via two distinct antineoplastic activities, the abilities to induce apoptosis and autophagy, therefore suggesting that it may provide a useful remedy to treat breast cancer (Huang et al., 2010).

Based on the literature, it is clear that the diet schedule of the present survey to treat cancer includes suitable foods along with potential anticancer herbs which enhance the general health, remove the free radicals and treat the cancer growth.
25. KIDNEY RELATED DISEASES

The kidneys are important organs that serve several essential regulatory roles in most animals, including vertebrates and some invertebrates. They are essential in the urinary system and also serve homeostatic functions such as the regulation of electrolytes, maintenance of acid–base balance, and regulation of blood pressure (via maintaining salt and water balance). They serve the body as a natural filter of the blood, and remove wastes which are diverted to the urinary bladder. In producing urine, the kidneys excrete wastes such as urea and ammonium, and they are also responsible for the reabsorption of water, glucose, and amino acids.

Diseases of the kidney are diverse, but individuals with kidney disease frequently display characteristic clinical features. Common clinical conditions involving the kidney include the nephritic and nephrotic syndromes, renal cysts, acute kidney injury, chronic kidney disease, urinary tract infection, nephrolithiasis, and urinary tract obstruction (Cotran et al., 2005). Various cancers of the kidney exist; the most common adult renal cancer is renal cell carcinoma. Cancers, cysts, and some other renal conditions can be managed with removal of the kidney, or nephrectomy. When renal function, measured by glomerular filtration rate, is persistently poor, dialysis and kidney transplantation may be treatment options. Although they are not severely harmful, kidney stones can be a pain and a nuisance.
Chronic kidney disease occurs when one suffers from gradual and usually permanent loss of kidney function over time. This happens gradually, usually months to years. Chronic kidney disease is divided into five stages of increasing severity. Mild kidney disease is often called renal insufficiency. With loss of kidney function, there is an accumulation of water, waste, and toxic substances, in the body, that are normally excreted by the kidney. Loss of kidney function also causes other problems such as anemia, high blood pressure, acidosis (excessive acidity of body fluids), disorders of cholesterol and fatty acids, and bone disease. At the end-stage of renal disease, there is total or near-total loss of kidney function with the dangerous accumulation of water, waste, and toxic substances, and most individuals in this stage of kidney disease need dialysis or transplantation to stay alive.

The approximate prevalence of chronic kidney disease in India is 800 per million populations, and the incidence of end-stage renal disease is 150–200 per million populations. The most common cause of chronic kidney disease in population-based studies is diabetic nephropathy. India currently has 820+ nephrologists, 710+ hemodialysis units with 2,500+ dialysis stations and 4,800+ patients. There are 172+ transplant centers, two-thirds of which are in South India and mostly privately run (Agarwal & Srivastava, 2009).
Chronic kidney diseases, often accompanies cardiovascular disease, are largely a result of increasing frequencies of obesity, hypertension, and diabetes. Nutritional therapy occupies a critical role in reducing risk factors and preventing progressive damage to the kidneys and heart. Packard et al. (2006) reviewed and examined several diet components and eating styles for efficacy in the treatment of these conditions. A variety of dietary regimens claim to provide health benefits. An urgent need exists for eating styles that reduce risk of chronic diseases and that are acceptable and achievable in free-living populations.

Touwaide et al., (2005) gathered the data on the plants used for the treatment of pathologies of kidneys and the urinary tract from the most ancient medical texts of classical antiquity, the Corpus hippocraticum, the Aristotelian problems, and De ateria edica by Dioscorides. If hippocratic information is scant and practical, aristotelian are of a more theoretical nature and propose an explanation of the action of drugs on the urinary tract. De ateria edica, coming after a possible research activity in the Alexandrian school, reports the action of many drugs. The work had a deep influence on the subsequent centuries, up to the birth of modern pharmacochemistry.

In the present survey, the diet schedule includes Cocos nucifera, Mus paradisiaca, Punica granatum, Vitis vinifera, Carica papaya, Citrus limon, Cucumis sativus, Daucus carota, Lycopersicon esculentum, and Malus domestica as top ten species (Table 2).
Although traditional healers have limited scientific knowledge on kidney, they continue to provide medicinal plants to treat kidney symptoms. A prospective study conducted by Engani et al. (2010) from January to March 2007 to collect the opinion of traditional healers in the area of three towns (Ouagadougou, Ziniare, Fada Nourma) of Burkina Faso showed that eighty-three percent of traditional healers found that the origin of kidney symptoms was related to food supplementation. Medicinal plants have been identified, related to 10 families and 50 genders. *Combrum micrant hum*, *Chrysanthemum americanum* and *Tamarindus indica* were the most frequent species of plants under use.

Vitamins and minerals play an important role in proper function of kidney. Elemental analysis on composition of some Ayurvedic medicinal plants used for healing urinary tract disorders showed the presence of elements in different plants with Cu, Cr, Co and Cd at the trace level; Mn, Zn, Pb, Ni, Na, Fe and Hg at minor level and Ca and Cl at major level (Rajurkar & Damame, 1998). Bhan and Thadhani (2009) reviewed the role of vitamin D therapy in chronic kidney Diseases. Vitamin D has played a central role in the nephrologist's armamentarium, with active vitamin D analogues enjoying broad use for treatment of secondary hyperparathyroidism. Increasing data are now coming to light about the broader biological actions of vitamin D in the progression of chronic kidney disease.
Kidney is also an important organ for the regulation in the metabolism of both fat (vitamin A, D) and water soluble vitamins (e.g. vitamin B₂) which is mediated by glomerular filtration as well as reabsorption and secretion processes of protein-bound vitamins (Raila & Schweigert, 2001). In the meantime, high-dose vitamin C can induce hyperoxaluric nephropathy and progressive renal failure (Rathi et al., 2007). Trichosanthes fruits, one of the herbs of the present study, significantly reduce the excretion of oxalate, calcium, and phosphate along with decreased levels of blood urea nitrogen, uric acid and creatinine in serum, reduce hyperoxaluria-caused oxidative stress and restore antioxidant enzyme activity and their expression profile in kidney tissue. It decreased renal epithelial damage, inflammation, and restored normal glomerular morphology (Kamboj et al., 2011). Oxidative stress contributes to the pathophysiology of kidney injury. Ferulic acid, antioxidant, enhances the recoverability of renal function and minimizes the renal damage through reduction of oxidative stress, tubular apoptosis and the interstitial fibrosis in the solitary kidney after relief of partial ureteric obstruction of a solitary kidney (Shokeir et al., 2012). Kidney function may be impaired by pathogenic attack and such pathogens should be killed without affecting the kidney. The fern Drynaria has antibacterial activity against clinically isolated urinary tract pathogens (Ithraja, 2012). The fruits, vegetables, pulses, cereals and other medicinal herbs with antioxidants, vitamins, minerals and other bioactive compounds may cure several kinds of chronic kidney diseases.
26. OBESITY

Obesity or adiposity indicates an excess of fat tissue. Central obesity is indicative of excess fat accumulation in the truncal region. Adiposopathy signifies a state of anatomically/functionally pathological adipose tissue accumulation, promoted by positive caloric balance in a genetically and environmentally susceptible individual, resulting in adverse endocrine and immune responses that may directly promote cardiovascular disease or worsening of metabolic state (Bays et al., 2005). The Asian Indian phenotype or the thin fat Indians have a characteristic central adiposity with accompanying sarcopenia. Individuals with above normal BMI are classified as overweight (23.0-24.9) or obese (=25.0) (WHO, 2004). As per the second National Family Health Survey, the prevalence of obesity is as high as 30-35% in affluent states of Punjab and Delhi (IIPS, 2000). The rural prevalence of obesity has also seen rising trends lately and Vedapriya, et al (2012) in this issue, report a prevalence of BMI =25 kg/m2 in as high as 25.2% of normotensive in comparison to 37.5% of hypertensive subjects in rural population from South India.

As far as obesity problem is concerned, no single approach will successfully treat obesity. Lifestyle modification and herbal medication presently remains the main pillars of any intervention aiming at decreasing body weight (Kumari et al., 2011). Hasani-Ranjbar et al. (2009) reviewed the efficacy and safety of effective herbal medicines in the management of obesity in humans and animals. Studies with *Cissus quadrangularis, Sambucus nigra, Asparagus*
Garcinia officinalis, Garcinia atroviridis, ephedra and caffeine, Slimax (extract of several plants including Ingiber officinale and Bofutsushosan) showed a significant decrease in body weight. George and Nimmi (2011) reviewed about 100 medicinal plants commonly used as dietary supplements for obesity found in Asian countries particularly in India, China, Taiwan, Korea and Africa. Roh et al., (2012) suggest that a promising anti-obesity agent like methyl gallate might be of therapeutic interest for the treatment of obesity.

The top 10 plant species in the diet schedule of the present study (Table 28) include Citrus aurantium, Citrus limon, Cocos nucifera, Ananas comosus, Carica papaya, Erythrina indica, Persicn esculentum, ura a kenigii, Musa paradisiaca and Vitis vinifera.

SH21B is an anti-obesity composition composed of seven herbs: Scutellaria baicalensis Georgi, Prunus armeniaca Maxim, Ephedra sinica Stapf, Acorus gramineus Soland, Pala orientalis Presl, Galeopsis tenuifolia Willd and Nelumbo nucifera Gaertner. It has been used for the treatment of obesity in traditional medical clinics in Korea, SH21B significantly inhibited fat accumulation in 3T3-L1 adipocytes and reduced adipose tissue and serum triglyceride levels in high fat diet-induced obese mice. Microarray analyses showed that SH21B affected more genes in the adipogenesis pathway than any other pathway studied (Lee et al., 2010).
Anticancer citrus compounds act on multiple key elements in signal transduction pathways related to cellular proliferation, differentiation, apoptosis, inflammation, and obesity (Tanaka et al., 2008). Lemon Polyphenols Suppress Diet-induced Obesity by Up-Regulation of mRNA Levels of the Enzymes Involved in β-Oxidation in Mouse White Adipose Tissue (Fukuchi et al., 2008). Yoshida et al. (2010) and Kim et al. (2012) showed that hesperetin and naringenin, two citrus flavonoids, inhibit TNF-a-stimulated Free Fatty Acid secretion from mouse adipocytes. These flavonoids block the TNF-a-induced activation of the NF-κB and ERK pathways. Moreover, hesperetin and naringenin prevent TNF-a from downregulating the transcription of two antilipolytic genes, perilipin and PDE3B. These effects are mediated through the inhibition of the ERK pathway. Sengupta et al., (2011) have demonstrated a herbal formulation (Moringa oleifera, Murraya koenigii and Curcuma longa) inhibiting adipocyte differentiation and potentiates lipolysis in 3T3-L1 mouse adipocytes. Antiobesity and antihyperlipidemic of Murraya koenigii (Birari et al., 2010) and Erythrina indica have also been reported (Kamalraj (2011). Guo et al. (2006) suggested that octanoate-mediated inactivation of PPARγ might contribute to the down regulation of lipogenic genes in adipocytes, and ROS appears to be involved as a mediator in this process. Retinoic-acid (atRA), may be a potent modulator of obesity by repressing the PPARγ-regulated adipogenesis pathway at all stages and by augmenting TNFα-induced lipolysis and apoptosis in mature adipocytes (Dave et al., 2012).
Consumption of resistant starch decreases lipogenesis in adipose tissues but not in muscular tissues of growing pigs (Martinez-Puig et al., 2006). As mentioned above, several agents may inhibit the adipogenesis. In the meantime, fat accumulation in humans is correlated with systemic oxidative stress (Furukawa et al., 2004) which significantly modulates adipose tissue and adipocyte apoE expression and it also contributes to suppression of adipocyte apoE in obesity which depends on interaction between adipose tissue stromovascular cells and adipocytes (Espiritu & Mazzone, 2008). The dietary formulation of the present study to control obesity may act in many ways with the main role of antioxidants. Campari tomato decreased sreb1 mRNA by increase of foxo1 gene expression, which may depend on high contents of β-carotene in this strain (Tainaka et al., 2011).

Thus, naturopathy regards raw foods as greatest dietary constituents for breaking down unhealthy fat tissue and replacing it with firm flesh. Raw, green vegetables and juicy fruits are the certain enemies of flabby, diseased flesh and fat on the shoulders, abdomen and hips, as well as girth of waist. Effective weight reduction is quickly accomplished with raw foods without sustaining the sunken-faced, hollow-eyed look which usually characterizes individuals who attempt to lower their weight by starving themselves on a meager diet of cooked foods which, when eaten plentifully, carrying the minimum amount of nutrition (Estes, 1963).
27. HYPERTENSION

Hypertension (HTN) or high blood pressure, sometimes called arterial hypertension, is a chronic medical condition in which the blood pressure in the arteries is elevated. This requires the heart to work harder than normal to circulate blood through the blood vessels. Hypertension is classified as either primary (essential) hypertension or secondary hypertension (Carretero & Oparil, 2000). The secondary hypertension is caused by conditions that affect the kidneys, arteries, heart or endocrine system. It increases the risk of ischemic heart disease (Lewington et al., 2002) strokes, peripheral vascular disease, and other cardiovascular diseases, including heart failure, aortic aneurysms, diffuse atherosclerosis, and pulmonary embolism. It is also a risk factor for cognitive impairment and dementia, and chronic kidney disease (Eoin et al., 2007; Singer & Kite, 2008). Other complications include: Hypertensive retinopathy and Hypertensive nephropathy (Zeng et al., 2009). Hypertension is said to be present in 25% urban and 10% rural subjects in India. Borderline hypertension (systolic BP 130–139 and/or diastolic BP 85–89 mmHg) and Stage I hypertension carry a significant cardiovascular risk (Gupta, 2004). Hypertension prevails in one-fifth of Chennai (Urban south Indian population) and isolated systolic hypertension is more common among elderly population (Mohan et al., 2007). In an urban adult population of Salem, Tamil Nadu, females are at an increased risk of obesity, but the males are at increased risk of hypertension (Gupta et al., 2011).
Several classes of medications, collectively referred to as antihypertensive drugs, are currently available for treating hypertension. The most widely used common drugs are the thiazide diuretics, the ACE inhibitors, the calcium channel blockers, the beta blockers, and the angiotensin II receptor antagonists or ARBs. There are several reports for traditional medicines to control hypertension. In Tuscany, among 400 popular ethnomedicinal plants, over 30 plants are used to treat hypertension (Manganelli et al., 2000). *Hibiscus* tea has a substantial antihypertensive effect attributable to the flower's ACE-inhibiting anthocyanin content, and possibly to a diuretic effect. *Hibiscus* conferred an antihypertensive effect comparable to 50 mg./day of the drug captopril (Mozaffari-Khosravi et al., 2009, McKay et al., 2010, Herrera-Arellano et al., 2004, 2007). The flavonoid, quercetin, reduces the elevated blood pressure, the cardiac and renal hypertrophy and the functional vascular changes in Spontaneously hypertensive rats without effect on normotensive Wistar Kyoto rats. These effects are associated with a reduced oxidant status due to the antioxidant properties of the drug (Duarte et al., 2001).

In the present survey, the diet schedule consists of the following species (Table 29) *Citrus limòn, Vitis vinifera, Carica papà, Cocos nucífera, Caropotens esculentum, Musa paradisiaca, Cinhòdít dactílo, Ringa leiòra, Sidium guaíla and Abelmoscús esculentus* as top ten plants. *Aucas carì, Eclipta pròstrata, Caropotens esculentum, Ringa leiòra* etc.
In recent years, reactive oxidative species (ROS) have been suggested to play a key role in the pathogenesis of hypertension. Most of the species used as antihypertensive agents, in the present study (Table 29) like grapes, tomato, citrus, moringa etc. are having strong antioxidant property. Tomato extract contains carotenoids such as lycopene, B-carotene and vitamin E which are known to be effective antioxidants, can inactivate free radicals. By clinical studies several agents of the present study, like coconut, grape, papaya, guava and tomato have been proved to be of good antihypertensive agents. In Turkey one 72.5% hypertensive patients are using alternative therapy and 40% are drinking lemon juice (Adibelli et al., 2009). Recently, Talha et al. (2011) have enumerated more than 70 species of plants with antihypertensive activity.

**V**itis **vinifera** leaf hydroalcoholic extract has vasorelaxant effect on rat aorta. The effect is on the cell membrane rather than an intracellular event (Naseri et al., 2005). Grape (**V**itis **vinifera**), with many bioactive constituents including flavonoids, polyphenols, anthocyanins and stilbene derivatives resveratrol, has shown that extracts from seeds and skin have biological and therapeutic effects such as antioxidative, anticarcinogenic, antimicrobial, antiviral, antiaging, antiinflammatory, antidiabetic activities as well as having cardioprotective, hepatoprotective and neuroprotective effects (Sagdic & Cetin, 2009). Oral administration of grape skin extract significantly reduced systolic, mean and diastolic arterial pressure in Wistar rats. The antihypertensive effect of grape skin extract might be owing to a combination of vasodilator and antioxidant
actions (Soares De Moura et al., 2002). Regular consumption of tropical food drinks, coconut (Cocos nucifera) water and mauby (C. lubrina arbrescens) controls hypertension (Alleyne et al. 2005). Crude ethanol extract of unripened fruit of Carica papaya, produced relaxation of vascular muscle tone in rabbits. The fruit juice of C. papaya with antihypertensive agent(s) exhibits mainly alpha-adrenoceptor activity (Eno et al., 2000).

Tomato cultivar 'DG03-9' with high concentration of Gamma-aminobutyric acid is a potent antihypertensive food (Yohsimura et al., 2010). Drink containing tomato vinegar is safe and useful for regulating the blood pressure (Tetsuya et al., 2006). Antioxidant and antihypertensive activities has also been confirmed in pink guava ‘puree’ (Ayub et al., 2010). Ethanolic extract from leaves of Psidium guajava has significant adaptogenic activity (Lakshmi & Sudhakar, 2009). Moringa leaves show the presence of antioxidative and antihypertensive potential with the bioactive compounds. The leaves are rich in protein, β-carotene, vitamin C, calcium and potassium, glycosides, chlorogenic acid, rutin, quercetin, and kaempferol which are excellent source of antioxidants (Atawodi et al., 2010). Moringa leaf extract significantly reduces cholesterol and atherosclerotic plaque formation in the carotid arteries by the presence of Beta-sitostanol (Ghasi et al., 2000). The Moringa leaves also improved myocardial contraction and relaxation. The heart fibers and the mitochondria (the energy factories of the cells) also maintained their ultrastructure (Nandave et al., 2009).
Nitrile, mustard oil glycosides and thiocarbamate glycosides (Anwar et al., 2007), chlorogenic acid (Watanabe et al., 2006) are proved to be of antihypertensive agents. *Abelmoschus esculentus* L. with the predominant phenolic compound procyanidin B2, procyanidin B1 and rutin in seeds, catechin, procyanidin B2, epicatechin and rutin in pulp show high antioxidant activity (Khomsug et al., 2010). Recently, a new antioxidant flavonol glycoside (5,7,3′,4′-tetrahydroxy-4″-O-methyl flavonol -3-O-β-D-glucopyranoside) has been isolated from the fruit of *A. esculentus* together with one known compound 5,7,3′,4′-tetrahydroxy flavonol -3-O-[β-D-glucopyranosyl-(1→6)]-β-D-glucopyranoside (Liao et al., 2012). *Amuri*, a *Amiarpam* in Siddha System from Banana tree exhibited significant diuretic activity (p<0.001) at a dose level of 8ml and 10ml/kg bw. It produces a significant increase in the force of contraction and heart rate (p<0.001) (Jaiprakash et al., 2006). Diuretic activity of *Cynodon dactylon* has also been confirmed by Gowda et al., (2009).

Thus, all the top ten species used to treat hypertension in the present survey, have direct effect or indirect effect through antioxidant activity, in lowering the blood pressure.
28. CARDIOVASCULAR DISEASE

The heart is myogenic muscular organ found in all animals with a circulatory system (including all vertebrates), which pumps blood throughout the blood vessels by repeated, rhythmic contractions. Cardiac muscle is an involuntary striated muscle tissue found only in this organ and responsible for the ability of the heart to pump blood.

Cardiovascular disease is a class of diseases that involve the heart or blood vessels (arteries and veins). India will become the world’s capital of heart diseases by 2015, says Dr Naresh Trehan, CMD, Medanta City. Speaking at the heart protection assembly, Trehan said the health profile of the country’s people is becoming more vulnerable to heart diseases, and around 12-14% of the country’s population is likely to suffer from cardiac diseases in their lifetime. Urging people to maintain a healthy lifestyle and to avoid junk food, Trehan said the profile of the people in developed countries such as Japan, Australia and the US is becoming better as they are becoming more conscious of their food habits (Daily News and Analysis, Friday, Nov 25, 2011).

Different types of cardiovascular disease include coronary heart disease, cardiomyopathy, hypertensive heart disease, heart failure, inflammatory heart disease, vascular heart disease, etc. Almost all cardiovascular disease in a population can be explained in terms of a handful of risk factors: age, gender, high blood pressure, high serum cholesterol levels, tobacco smoking, excessive
alcohol consumption, family history, obesity, lack of physical activity, psychosocial factors and diabetes mellitus (Bridget B. Kelly, 2010).

In the present survey the diet schedule (Table 30) for patients with cardiovascular diseases includes *Ananas comosus, Centella asiatica, Citrus aurantium, Citrus limon, Cocos nucifera, Cucumis sativus, Cynodon dactylon, Daucus carota, Eclipta prostrata, Cucurbita pepo, Persica esculentum, Angi era indica, Murraya koechii, Musa paradisiaca, Ruta sativa, Phoenix dactylifera, Piper nigrum, Siderium guaiacum, Punica granatum, Trichosanth es anguiana* and *Vitis vinifera.*

A diet based on restricting carbohydrates leads to spontaneous caloric reduction and subsequent improvement in emerging markers of CVD in overweight/obese men who are otherwise healthy (Wood *et al.*, 2006). Proposed practical dietary recommendations for the prevention of CVD (Scholl, 2012) is:

i. Change *fat quality* to improve dyslipoproteinemia: 1. **Good fats:** olive oil, canola/rapeseed oil, nut oils, nuts, seeds, and fish with omega-3-fatty acids, 2. **Neutral fats:** saturated fats in milk products and cheese, 3. **Bad fats:** fat in processed meat, sausages, transfatty acids in bakery products, cookies, sweets, and so forth.

ii. Eat plenty high-volume-low-calorie foods: vegetables, salads, and fruits.
iii. Reduce total carbohydrate intake, prefer low-glycaemic index foods, and reduce glycaemic load to lower fasting and postprandial glucose and insulin levels (the more insulin resistant, the stronger this recommendation is to be followed): 1. **Good carbohydrates**: non-starchy vegetables, salads, legumes, most fruits, and whole and minimally processed grains, 2. Eat few and prefer whole grain bread, brown rice, and pasta, 3. **Carbohydrates to avoid**: low-fibre cereals, sugars, HFCS (high-fructose-corn-syrup) sweetened soft-drinks, snacks, pizza, fries, baked potatoes, sweets, white and brown bread, and all foods containing refined starch.


v. Physical activity: 30 min daily of moderate physical activity is the minimum amount necessary for health.

The diet composition of the present survey reflects the basic principles of above guidelines with a small amount of carbohydrates (sugars) from some fruits. Evidences suggest that increase intake of antioxidants to be protective in cardiovascular diseases (Subash Vijaya kumar *et al.*, 2020). Taking natural dietary antioxidant vitamins are good for health.
Based on the present study, it is observed that Diabetes mellitus Type-2 is the dominant disease represented by 3325 number of patients treated per year. So a detailed study has been carried out on naturopathic treatment of diabetes Type-2 both by interviewing the naturopaths and the patients who had undergone naturopathic treatment. Out of 57 T2DM (Diabetes mellitus Type 2) patients identified, only 40 patients with their complete laboratory reports of blood sugar levels were selected and interviewed. General demographic details such as age, sex, height, weight, number of years affected, the level of blood sugar and diabetic complications/symptoms before and after treatment are presented in the Table 32. In their medical practices, details about both non dietary practices (time deviation, number of restrictions followed and withdrawal of previous treatment) and dietary practices (suggested medicine/diet taken or not, the chosen diet from the choices of diet advised) have been collected.

Out of 40 patients selected, 21(52%) are male and 19 (48%) are female with their mean age 50.58 and 50.46 respectively and the average height and weight have been given in tables 32 and 33. Patients in the age group 51-55 years are more followed by the age group 41- 45. When the sex groups are considered, there is no much of difference in the prevalence of diabetes. In Saurashtra (Gujarat-India) also the prevalence of maximum number of diabetic patients is in the age group 51-60 and the survey revealed that certain dietary and life style regimes are responsible in manifestation of DM (Rohit et al., 2012).
The detailed dietary schedule for diabetic (Type 2) patients has been given in table. Before breakfast, at 5.00 am seed-soaked water prepared from *Cuminum cyminum* (Jeera) or *Trigonella foenum-graecum* (Fenugreek) (in 500 ml - overnight) is taken. At 6.30 a.m 300 ml of aqueous extract of *Cynodon dactylon*-leaves is taken.

Breakfast includes coconut endosperm, any one sprout of pulses, paste from five different spices and one porridge from any one cereal along with butter milk. The preparation is as follows. 30 g of coconut endosperm-scrapings is mixed with any one of the following sprouts (30 g): *Phaseolus aureus*, *Cicer arietinum*, *Arachis hypogaea*, *Vigna unguiculata*, *Pisum sativum*, *Pennisetum glaucum* or *Triticum aestivum*. In addition, 400 ml of skimmed butter-milk mixed with the paste made up of *Trigonella foenum-graecum* (seeds 3 gm), *Allium cepa* (bulb 7-8), *Rue* (seeds 5-8 numbers), *Umbelula elata* (Leaves 20 numbers), *Cuminum cyminum* (seeds 25-30 numbers) along with any one of the following porridges (from 100 g powdered seeds): *Pennisetum glaucum*, *Elusine corocana*, *Triticum aestivum* or *Avena sativa*.

After breakfast, 300 ml aqueous extract of leaves (10 g) of *Eclipta prostrata* and fruits (30 g) of *Emblica officinalis* are prepared and consumed separately at 10.00 am and 11.00 am respectively. 300 ml aqueous extract of *Eclipta asiatica* (10 g) is taken before lunch.
Mainly cereals and raw-vegetable salads are taken. Rice flakes or any one boiled cereals (\textit{Panicum miliaceum}, \textit{Triticum aestivum}, \textit{Pennisetum glaucum} and \textit{Oryza sativa}) with any one of the boiled leafy vegetables (\textit{Trogelia foenum-graecum}, \textit{Morinda oleifera}, \textit{Amaranthus tristis}, \textit{Sesbania grandiflora}) as side dish are consumed along with raw vegetable salad made from carrot and any two of eight vegetables (\textit{Momordica charantia}, \textit{Luffa acutangula}, \textit{Musa paradisaca}, \textit{Benincasa hispida}, \textit{Trichosanthes anguina}, \textit{Cucumis sativus}, \textit{Cucurbita pepo} and \textit{Sechium edule}) dressed with coconut scrapings, lemon juice, tomato pieces, curry leaves and pepper powder.

Aqueous extract of two important herbal medicines (300 ml water + 10g medicine) i.e \textit{Gymema sylvester} (leaves) and \textit{Cassia auriculata} (Flowers) are taken separately at 3.00 pm and 4.00 pm respectively. In the evening at 5.00 pm either juice (carrot juice mixed with coconut milk or peanut milk or tomato juice) or decoction (\textit{Eugenia jambolan} seeds as substitute for coffea or \textit{Cassia auriculata} flowers as substitute for tea) with palm sugar is taken.

**Supper / before bed:** For supper at 7.00 pm, mainly fruits or chapati is consumed. Coconut pieces-150 g (first consumed) along with any two of the fruits -100g with skin (\textit{Carica papaya}, \textit{Vitis vinifera}, \textit{Musa paradisaca}, \textit{Eugenia jambolan} and \textit{Citrullus lanatus}) may be taken. Instead, whole wheat-chapati (2-3 numbers) along with chutney made from coriandrum or curry leaf may also be taken. Before bed at 9.00 pm, a herbal medicine (powdered fruit-rind- 5g of \textit{Terminalia chebula}) in 100 mil of water is taken.
The results of average blood sugar levels of all the 40 patients, divided into 5 categories of age groups, have been given in the Table 33. Under 41-45 age group, 11 patients were recorded with the average blood sugar level recorded was 156.78 mg/dl during fasting and 251.84 mg/dl at postprandial before treatment and 111.84 mg/dl at fasting and 155.42 mg/dl post prondial after treatment respectively. Under 46 – 50 age group, 8 patients were recorded with the average blood sugar recorded was 154.83 mg/dl at fasting and 245.16 mg/dl at postprandial before treatment and 125.24 mg/dl at fasting and 163.29 mg/dl at postprandial after treatment. Similarly, under the 51 – 55 age group, 13 patients were recorded with the average blood sugar recorded was 160.02 mg/dl at fasting and 272.15 mg/dl at postprandial before treatment and 117.71 mg/dl at fasting and 156.53 mg/dl at postprandial after treatment. Among 56-60 age group, 5 patients were recorded with the blood sugar of 149.8 mg/dl at fasting and 267.19 mg/dl at postprandial before treatment and 114.66 mg/dl at fasting and 143.93 mg/dl at postprandial after treatment. Between the 61 - 65 age group, 3 patients were recorded with the average blood sugar 164.77 mg/dl at fasting and 288.21 mg/dl at postprandial before treatment and 102.33 mg/dl at fasting and 139.1 mg/dl at postprandial respectively. Blood sugar level is one of the prime parameters affecting the diabetes and allows a broader understanding of the complex relationships of the diagnostic and therapeutic tools during meal-related adjustments of blood glucose (Koschinsky et al., 2008). Thus in the present study, the average blood sugar was comparatively reduced in both fasting and
postprandial after naturopathic treatment. It was evidenced by the report that postprandial (at 2 hour) plasma glucose after glucose administration was significantly lower than the fasting level (Saha, 2006) by supplemented with Spirulina (Anuradha and Vidhya (2001), drum stick leaf tablets (Gridhari et al., 2011). Paliwal et al. (2009) also emphasized the reduction of reduced blood sugar levels by the use of natural drug. To date, over 400 traditional plant treatments for diabetes have been reported (Bailey and Day, 1989), although only a small number of these have received scientific and medical evaluation to assess their efficacy.

Relevance of naturopathic diet of the present survey for diabetic treatment: As the diabetes patients are with metabolic disorders particularly in relation to carbohydrate and lipid metabolism, the consumed food items should not much influence the blood sugar level which is described as glycemic index (GI). A low-GI food will release glucose more slowly and steadily, which leads to more suitable postprandial (after meal) blood glucose readings. A high-GI food causes a more rapid rise in blood glucose levels. So, the food items with low glycemic index are suitable for diabetics. Most fruits, vegetables, legumes, pulses, some whole intact grains, nuts, tagatose, fructose, kidney beans, beets and chickpeas are with low glycemic index (55 or less). In contrast, white bread, white rice, processed / polished cereals are with high glycemic index (70 and above). Hu et al. (2012) shows that higher consumption of white rice is associated with a significantly increased risk of type 2 diabetes, especially in Asian (Chinese and Japanese) populations.
The present dietary schedule shows the inclusion of food items like fruits, vegetables, unprocessed cereals and pulses with low glycemic index. For prevention of type 2 diabetes, several unmodified foods with functional properties have already been identified (low saturated fat products, vegetables, fruit, wholegrain foods, low glycemic index starchy foods). Overall, the available evidence on functional foods so far identified in this field is incomplete (Riccardi et al., 2005).

In the present survey on naturopathic treatment of diabetes (Type 2), totally 44 species with different pulses, cereals, fruits, nuts, vegetables, spices and medicinal herbs have been recorded. Unlike non-diabetic persons, who take mainly the carbohydrate source as main food, the diabetic patients of the present survey are advised to take mainly the proteinaceous food from cereals like *Triticum aestivum*, *Avena sativa*, *Eleusine corocana*, *Pennisetum glaucum*, * Panicum miliaceum*, *Oryza sativa* in the form porridge for breakfast and boiled form for lunch and pulses like *Phaseolus aureus*, *Cicer arietinum*, *Arachis hypogea*, *Vigna unguiculata* and *Pisum sativum* in the form of sprouts during breakfast. Even the rice *Oryza sativa* is taken as the hand pounded item.

It is clear that to treat diabetes, the major change in dietary habit is followed. In ancient time “Navathaniyam” mixture of nine grains ("Nell"- Paddy, "Ell"- Sesame, "Koll"- Horse gram, "Payaru"- Green gram, "Uzhunthu"- Black gram, "Solam"- Maize, "Irungu"- another variety of grain, "Samai"- Millet, and
"Kurakkan" - another variety of grain) had been used as staple food along with rice, particularly Tamil Nadu. Such traditional dietary habit kept the people more healthy without any major health problems including diabetes. From the available region wise population based studies, it is clear that in the last two decades, there has been a marked increase in the prevalence of diabetes among both urban as well as the rural Indians, with southern India having the sharpest increase. Subsequent studies confirmed this high prevalence of diabetes in urban South India (Mohan & Pradeepa, 2009). Such sharp increase in number of diabetic patients in South India clearly reflects the change in dietary habit. Although such important ‘Navathaniyam’ is available in market as a single package, people are not interested to buy and use it. Moreover the staple food rice, at present, is also of completely milled and polished ones without the chance for the presence of any important B-complex vitamins. With these reasons, background and importance of ‘Navathaniyam’ for the prevention of diabetes, the naturopaths of the present survey commonly suggest the diabetic patients to take this traditional food of Tamil Nadu as the medicine to treat and prevent diabetics.

Recent data have shown that postprandial triglyceride-rich remnants are atherogenic, and postprandial hypertriglyceridemia contributes to the metabolic disturbances transforming LDL and HDL subclasses into more atherogenic direction in diabetic patients (Mero et al., 1998). So diabetics are suggested to take low saturated fat products. In the present diet schedule for diabetics is also
with low saturated fat products like coconut, peanuts and skimmed butter milk. In general the diet schedule of the present study is with more of fruits, vegetables and legumes. When compared to glucose, the monosaccharide fructose, the fruit sugar is with low glycemic index (less than 55 in fructose, more than 70 in glucose). In the present dietary schedule fruits are suggested as major food items for supper.

There has been a long history of dietary treatment of diabetes mellitus. Dietary treatment of diabetes mellitus was used in Egypt as long ago as 3,500 B.C., and was used in India by Sushruta and Charaka more than 2000 years ago. Based on what is known of the components of plant-based diets and their effects from cohort studies, there is reason to believe that vegetarian diets would have advantages in the treatment of type 2 diabetes. Nevertheless, the use of whole-grain or traditionally processed cereals and legumes has been associated with improved glycemic control in both diabetic and insulin-resistant individuals. Long-term cohort studies have indicated that whole-grain consumption reduces the risk of both type 2 diabetes and cardiovascular disease. In addition, nuts (e.g., almonds), viscous fibers (e.g., fibers from oats and barley), soy proteins, and plant sterols, which may be part of the vegetarian diet, reduce serum lipids. In combination, these plant food components may have a very significant impact on cardiovascular disease, one of the major complications of diabetes. Furthermore, substituting soy or other vegetable proteins for animal protein may also decrease renal hyperfiltration, proteinuria, and renal acid load and in the long term reduce
the risk of developing renal disease in type 2 diabetes. The vegetarian diet, therefore, contains a portfolio of natural products and food forms of benefit for both the carbohydrate and lipid abnormalities in diabetes. It is anticipated that their combined use in vegetarian diets will produce very significant metabolic advantages for the prevention and treatment of diabetes and its complications (Jenkins et al., 2003). A higher consumption of anthocyanins and anthocyanin-rich fruit was associated with a lower risk of type 2 diabetes (Wedick et al., 2012). All these facts are reflected in the diet schedule of the present survey. Similar to the present study, recently Bradley et al., (2012) have also shown the improvements in self-monitoring of glucose, diet, self-efficacy, motivation and mood following initiation of Adjunctive Naturopathic Care for inadequately controlled type 2 diabetes patients who also experienced reductions in blood glucose that exceeded those for similar patients who did not receive Adjunctive Naturopathic Care.

Increasing evidence in both experimental and clinical studies suggests that oxidative stress plays a major role in the pathogenesis of both types of diabetes mellitus and their complications (Maritim et al., 2003). Free radicals are formed disproportionately in diabetes by glucose oxidation, nonenzymatic glycation of proteins, and the subsequent oxidative degradation of glycated proteins. Abnormally high levels of free radicals and the simultaneous decline of
Antioxidant defense mechanisms can lead to damage of cellular organelles and enzymes, increased lipid peroxidation, and development of insulin resistance. *Aegle marmelos* effectively reduces the oxidative stress induced by alloxan and produced a reduction in blood sugar (Sabu & Kuttan, 2004; Sharma et al., 2011). *Gymnema sylvestre* stimulates insulin secretion from human islets *in vivo* and *in vitro* (Al-Romaiyan et al., 2010). *Assia auiculata* (flowers) are potent antidiabetic agent (Pari & Latha, 2002, Latha & Pari, 2003 Hakkim et al., 2007). Brazilian *Eugenia jamboleana* fruits have not shown antidiabetic effect even by following the same method adopted as for Indian *ambla* which has antidiabetic effect (Pepato et al., 2005). David et al. (2010) have observed that the aqueous extract of *ambla* inhibit the glucose uptake in the intestine. In the present survey, for supper, the patients are advised to take coconut pieces along with any one of the following fruits: *Musa paradisiaca, Carica papaya, Vitis vinifera, Citrullus lanatus* and *Eugenia jamboleana* along with skin of the fruits. Coconut is one of the major foods for diabetic patient and it is used as main food during supper and as a mix in several salads during day time. The coconut kernel protein has potent antidiabetic activity through the reversal of glycogen levels, activities of carbohydrates metabolizing enzymes and the pancreatic damage to the normal levels due to its effects on pancreatic β cell regeneration by means of arginine (Salil et al., 2011). The virgin coconut oil has antidiabetic potential by reducing blood glucose through insulinotropic property and by reducing insulin resistance (Siddalingaswamy et al., 2011).
The fruits consumed, in the present survey, along with coconut are also potent anti-diabetic agents. With variety of flavonoids, alkaloids, saponins and tannins, is an antidiabetic agent, which induces regeneration of the β-cells of the pancreas, reduces fatty changes and pyknotic nucleus of liver and recovers the cuboidal tissue of kidney (Sasidharan et al., 2011). Grape polyphenol-enriched defatted soybean flour is able to significantly lower blood glucose levels in hyperglycemic mice (Roopchand et al., 2012). In the present study grape fruits are taken along with the sprouts of legumes like *Phaseolus* *aureus* *Vigna unguiculata* *Cicer arietinum* etc. which may lead to the more absorption of active polyphenols of grapes. The water melon also decreases blood glucose level, increases serum insulin level by effectively protecting the pancreatic cells death (Ahn et al., 2011).

Antidiabetic effect has been reported in *Musa sapientum* - flower (Ganugapati et al., 2012) and in its unripe fruit (Imam & Akter, 2011). Green fruits of *Musa* AAA (Chenkadali) show antioxidant and hypolipidaemic properties in alloxan induced diabetic rats (Kaimal et al., 2010). *Urea ambila* seed and *Ele maculatus* leaves together show increment of serum insulin levels, higher reduction in hyperglycemia, hyperlipidemia and restoration of β- cells in pancreas (Gohil et al., 2010).

Another important item in the diet of diabetic patients is vegetables which are dominated by cucurbits which are of potential anti-diabetic agents. Consumption of cruciferous vegetables is inversely correlated to many human
diseases including diabetes (Edmands et al. 2011). Cucurbits with flavonoids, cucurbitacin, show several pharmacological properties including antidiabetic activity (Dhimam et al. 2012). The carrot juice along the antidiabetic drug, Gliclazide show drastic decrease in blood sugar. The enhancement of drug action may be due to the presence of fiber and antioxidants present in carrot (Khayatnouri et al. 2011).

As the principle of naturopathy, foods are medicines and pure medicines are very little and they are also of natural agents. Some special anti-diabetic herbs like Aegle marmelos, Cassia auriculata, Gymnema sylvestre, Cenellia asiatica, Terminalia chebula, Cydonia dactylon etc. are also taken along with food. Aegle marmelos effectively reduced the oxidative stress induced by alloxan and produced a reduction in blood sugar (Sabu & Kuttan, 2004). The antidiabetic herb Gymnema sylvestre stimulates insulin secretion from human islets in vivo and in vitro (Al-Romaiyan et al. 2010). Cassia auriculata flowers possess antihyperlipidaemic and antidiabetic activity (Pari & Latha, 2002, Hakkim et al., 2007). Aqueous extract of Cassia auriculata flowers enhance the glycolysis of blood sugar and thus reducing the level of blood sugar (Latha & Pari, 2003). The extract of Gymnema sylvestre exhibited strong antioxidant and antidiabetic effect (Kang et al. 2012). Cenellia asiatica (Chauhan et al. 2010, Gayathri et al. 2011) shows anti-diabetic activity while Ecbolium nilagiricum shows antioxidant and free radical scavenging activity (Shyamala Gowri et al. 2010). Ecbolium nilagiricum restore the damaged β-cells of the pancreas (Kumar et al. 2006) and it
also has antioxidant potential (Senthilkumar & Subramanian, 2007). It improves glucose tolerance and brings down the fasting blood glucose (Murali et al., 2004). Brazilian *Eugenia jamboleana* fruits have not shown antidiabetic effect even by following the same method adopted as for Indian *ambelana* which has antidiabetic effect (Pepato et al., 2005). David et al. (2010) have observed that the aqueous extract of *ambelana* inhibit the glucose uptake in the intestine. Aqueous extract of *Cynodon dactylon* has high antidiabetic potential along with significant hypoglycemic and hypolipidemic effects. Total cholesterol (TC), low density lipoprotein (LDL) and triglyceride (TG) levels have decreased by 35, 77 and 29%, respectively, in severely diabetic rats whereas, cardioprotective, high density lipoprotein (HDL) has increased by 18% (Singh et al., 2007). The antidiabetic activity of ethanolic extract of *Cynodon dactylon* root stalks is comparable with the standard drug Tolbutamide (Kumar, 2011). *Cynodon dactylon* has also been proved as good antioxidant (Rai et al., 2010). Ivora et al. (1989) reviewed the active principles in experimentally proved antidiabetic herbs.

In the management of diabetics, spices are also play an important role (Srinivasan, 2005). *Trigonella foenum-graecum* is a potential antidiabetic agent (Renuka et al., 2009) which not only cures diabetes directly, but also suppress the symptoms of other diabetic complications by the alteration in lipid peroxidation, restoring membrane fluidity and activities of membrane bound and antioxidant enzymes (Kumar et al., 2012). The antidiabetic and insulin mimetic effects of fenugreek seeds have been reported in rabbits (Abdalla et al., 2012). Interestingly
there are several reports to show the role of *Trigonella foenum-graecum* in diabetic treatment both individually and also in combination with other agents like *Melia azedarach* - leaves which act synergistically on antidiabetic process (Ismail, 2009). *Muraya koenigii* protect the pancreatic beta-cells and decreases the oxidative stress (Arulselvan & Subramanian, 2007) and it shows more antidiabetic effect when compared to antidiabetic drug Glibenclamide (Arulselvan et al., 2006). *Cuminum cyminum* (Willatgamuwa et al., 1998) and *Coriandrum sativum* (Naquvi et al., 2012) are also potential antidiabetic agents. *Coriandrum sativum* has significant hypoglycemic activity in high dose and can be successfully combined with oral hypoglycemic agents in type 2 diabetic patients whose diabetes is not controlled by these agents (Waheed et al., 2006). The seeds of *Coriandrum sativum* not only possess antihyperglycemic property, but also antioxidative property (Deepa & Anuradha, 2011). Thus each and every diet item prescribed by the naturopaths for diabetic patient has either direct or indirect role in controlling the diabetics and almost all the food items and medicinal herbs of the present survey have been proved scientifically also.

Many kinds of natural products, such as terpenoids, alkaloids, flavonoids, phenolics, and some others, have shown antidiabetic potential. Particularly, schulzeines A, B, and C, radicamines A and B, 2,5-imino-1,2,5-trideoxy-L-glucitol, β-homofuconojirimycin, myrciacitrin IV, dehydrotrametenolic acid, corosolic acid (GlucosolTM), 4-(a-rhamnopyranosyl)ellagic acid, and 1,2,3,4,6-pentagalloylglucose have shown significant antidiabetic activities. *Momordica
Charantia L. (Cucurbitaceae), Pterocarpus marsupium Roxb. (Leguminosae), and Trigonella foenum-graceum L. (Leguminosae) have been reported as beneficial agents for the treatment of type 2 diabetes (Bnouham et al., 2006). Recent reviews show the presence of 76 (Kavishankar et al., 2011) and 58 (Dixit & Sudurshan, 2011) antidiabetic herbs. 38 antidiabetic plants, including a fern Nephrlepis tuberosa, are being used in Traditional Indian Medicinal System (Umashanker & Shruti, 2011). The main active ingredient of the extract obtained from Nephrlepis is sequoyitol, which can be used for treating diabetes and its complications (Tianyu, 2011). The above reviews include 18 of 44 antidiabetic plants of the present study. There are numerous ethnobotanical reports on herbal medicines based on the information from the local people like different tribal groups. Such kind of treatment is also on the basis of one or few medicines for one disease without much of change in dietary habit. Except few, most of such medicinally important herbs are unknown to common man. In contrast, food is the medicine in naturopathy and the main practice is to change in the dietary items which are of common and familiar to each and every patient.

The mechanism of both western medicines and Traditional Chinese Medicines to lower blood glucose are: to stimulate β cell of pancreatic islets to release insulin, to resist the hormones which raise blood glucose, to increase the number or rise the appetency and sensitivity of insulin receptor site to insulin, to decrease the leading out of glycogen, to enhance the use of glucose in the tissue and organ, to clear away the free radicals, resist lipid peroxidation, correct the
metabolic disorders of lipid and protein and to improve microcirculation in the body. The present survey on naturopathic treatment of diabetes, along with the available literature, also shows the above mechanisms in curing diabetes. In naturopathy, various kinds of triterpenoids, flavonoids and saponins in antidiabetic diet and herbs are the promising compounds (Li et al., 2004).

Role of sprouts in naturopathic treatment of diabetes:
The number of patients who consumed particular type of sprout, the average blood sugar level recorded before and after treatment and the difference in blood sugar level before and after treatment have been given in table 34 along with the graph and in plate VII.

The difference in blood sugar level in fasting / post prandial condition before and after treatment in relation to the consumption of various kinds of sprouts shows major difference between sprout consumed and non-consumed patients and also among the sprout consumed patients. Interestingly, the difference in blood sugar level before and after treatment in patients who did not consumed sprouts is low in general (31.27 - fasting, 94.64 - pp) and the difference is more than this level in all the patients (except *Vigna unguiculata* – sprouts consumed patients) who consumed sprouts with the maximum level of difference i.e maximum level of reduction in blood sugar (78.17 - fasting, 150.33 - pp) in patients who consumed sprouts of *Trigonella foenum-graecum*.
Thus in the present study, the sprouts play a major role in naturopathic treatment for diabetes. Several legume seeds were reported as common foods for the management of diabetes in India (Kaushik et al., 2010). McCue et al. (2005) also reported the anti-diabetic potential of aqueous extracts of soybean enriched for phenolic content by sprouting. To support further, *Cicer arietinum*, with two isoflavones namely biochanin-A and formononetin exhibited hypolipidemic properties (Siddiqui and Siddiqi, 1976).

At the same time, sprouts are safety foods with no toxic effects on proliferation and viability of HL-60 cells and should be included in our diets as healthy and safe fresh foods (Matinez-Villaleung et al., 2008). The sprouts are outstanding sources of protein, vitamins and minerals and they contain such in the respect of health-maintaining important nutrients like glucosinolates, phenolic and selenium-containing components (Marton et al., 2010). In the sprouts, the quantity of the protein fractions, nitrogen and amino acid contents increased during germination and non-protein amino acids also are produced which increased the biological value of the sprout protein and greater digestibility (Wanasundara et al., 1999; Rozan et al., 2001; Kim et al., 2004; Sung et al., 2005; Marton et al., 2010). Dietary therapy especially is showing a bright future in the management of T2DM (Kaushik et al., 2010). The aim of diet therapy in type 2 diabetes is to achieve glucose, lipid and blood sugar control. Many persons with type 2 diabetes are overweight; therefore a weight loss diet usually improves short-term blood glucose control. For long-term control, several strategies in
addition to weight loss can be implemented to achieve and maintain near-normal control. Dietary recommendations should be based on a nutritionally adequate diet determined by individual assessment with a reduction in fat, especially saturated fat, and an increase in physical activity. Thus, Medical Nutrition Therapy (MNT) is important in preventing diabetes, managing existing diabetes, and preventing, or at least slowing, the rate of development of diabetes complications (WHO, 1994; Bantle et al., 2008). The ideal diet for diabetic patients remains to be determined to reduce the risk for coronary heart disease, a major killer of diabetic patients (Grundy, 1991). Nutritional management is a cost-effective approach to health care (CFNI, 2004). Hence the present study on the usages of various sprouts for the treatment of Diabetes mellitus form the new report in Medical Science.

Roles of Porridges in Naturopathic Treatment of Diabetes:

Among forty patients tested, 13 patients did not consume any porridge, and of the remaining 27 patients, maximum of 12 patients had consumed porridge of *Avena sativa* in contrast to minimum consumption of *EUncelsetum laevum* which has been consumed by only two patients. The results of porridges used for the treatment of diabetes have been given in the Table 35 with graph and in Plate VII. From the results, it has been observed that there is not much of difference between consumers and non-consumers of cereals-porridges. Similarly Hsieh (2010) also reported that the consumption of rice porridge as breakfast reduced the postprandial blood sugar level significantly in elderly people of Taiwan. Even
in Chinese foods, rice porridge produces a higher glycemic response than steamed rice and noodles, despite their similar carbohydrate contents (Chan et al., 2004).

Venn and Mann (2004) have reviewed the evidence for the role of whole grain foods and legumes in the aetiology and management of diabetes and they have found that whole grain foods are protective against the development type II diabetes and they improve indicators of glucose, lipid and lipoprotein metabolism in people with diabetes and in healthy people. The acute metabolic advantage in glucose handling appears at least in part to be due to the intact structure of the grain or legume.

**Influence of vegetables salad on blood sugar level (Plate VI):**

The results of vegetable salad used for the treatment of diabetes were given in the Table 36a. Among the vegetables salad consumed during lunch, *Daucus carota* was the dominant plant consumed by 25 patients and the average blood sugar level recorded before treatment was 157.09mg/dl at fasting and 265.22mg/dl at postprandial and reduced to 115.86mg/dl at fasting and 153.77mg/dl at postprandial after treatment. *Momordica charantia* was used by 9 patients and their average blood sugar level recorded before treatment was 155.99mg/dl at fasting and 259.88mg/dl at postprandial and decreased to 111.36mg/dl at fasting and 146.66mg/dl at postprandial after treatment. *Luffa acutangula* was used by 6 patients and their average blood sugar level recorded before treatment was 159.27mg/dl at fasting and 250.1mg/dl at postprandial was decreased to 124mg/dl at fasting and 171.44mg/dl at postprandial after treatment.
respectively. Thus in the present study, the intake of vegetable salads leads to the reduction of sugar level in T2DM patients. In previous prospective studies conducted in Caucasians, increased amount of vegetables intake (Montonen et al., 2005) or certain type of vegetable intake (Liu et al., 2004; Montonen et al., 2005; Bazzano et al., 2008) was associated with a reduced risk of diabetes. In a cross-sectional study conducted in Caucasians showed that frequent consumption of salad and raw vegetables was also associated with a decreased risk of diabetes (Williams et al., 1999). Similarly, the consumption of fresh vegetables was also associated with a low risk of having diabetes in women in China (Zhou et al., 2011). Increased intake of fruits is generally recommended as part of a healthy diet because of an inverse association with obesity and cardiovascular disease (Salas-Salvado et al., 2011). However the results of a recent systematic review of 5 cohort studies did not suggest that vegetable consumption may lower the risk of diabetes (Hamer et al., 2007).

The results of rice flakes used for the treatment of diabetes were given in the Table 39. Among the rice flakes used during lunch, *Oryza sativa* was taken along with the fruits of *Phoenix dactylifera* by 12 patients and their average blood sugar level recorded before treatment was 152.69mg/dl at fasting and 263.94mg/dl at postprandial was decreased to 110.46 mg/dl at fasting and 151.1mg/dl at postprandial after treatment respectively. Similarly, *Oryza sativa*
was taken along with seeds of \textit{Piper nigrum} by 11 patients and their average blood sugar before treatment was 172.24mg/dl at fasting and 267.05mg/dl at postprandial was decreased to 119.9mg/dl at fasting and 148.75mg/dl at postprandial after treatment respectively. Other than rice flakes was consumed by 17 patients and their average blood sugar recorded before treatment was 150.58 mg/dl at fasting and 256.78 mg/dl at postprandial was decreased to 117.54 mg/dl at fasting and 161.36 mg/dl at postprandial after treatment respectively. Thus in the present study, rice has been used as an indigenous food diet to control T2DM to reduce the blood sugar level. Similarly, traditional usages on rice to control T2DM around global level have also been reported (Ahmed et al., 2009). The reduced level of blood sugar in the present study may be attributed to the presence of phytochemicals in the rice such as Oryzarans A – D (Hikino et al., 1986). Silva et al., (2005) also reported that the rice significantly reduced the blood sugar level in serum administered to the patients in Brazil. Thus this report on reducing sugar to control T2DM forms the first report in Medical Science.

\section*{Influence of leafy vegetables (Table 36a, Plate VI):}

The results of leafy vegetables used for the treatment of diabetes were given in the Table 40. Among the leafy vegetables, \textit{Amaranthus tristis} was the dominant plant used by 19 patients and their average blood sugar level recorded before treatment was 154.8mg/dl at fasting and 263.17mg/dl at postprandial was decreased to 113.92mg/dl at fasting and 154.36mg/dl at postprandial respectively. \textit{Trigonella foenum-graecum} was used by 15 patients and their
average blood sugar level recorded before treatment was 158.26mg/dl at fasting and 262.52mg/dl at postprandial was decreased to 115.79mg/dl at fasting and 153.57mg/dl at postprandial after treatment. Morina oleifera was used by 6 patients and their average blood sugar level recorded before treatment was 161.94mg/dl at fasting and 255.33mg/dl at postprandial was decreased to 123.55mg/dl at fasting and 159.38mg/dl at postprandial after treatment respectively. Leafy vegetables being good source of proteins, minerals and energy could serve a means of enhancing nutritive value of food (Pandey et al., 2006) and formed a part of rural household food security strategies for generations. From the result, it was observed that the reduction of blood sugar level was due to the consumption of leafy vegetables. To support this view, Kochhar et al., (2009) reported that the consumption of leafy vegetables as daily diet should have protective role in diabetes while inadequate consumption may lead to deficiency of minerals of vitamins and minerals like iron, zinc and vitamin B12. Similarly Larsson and Wolk (2007) reported that the intake of magnesium-rich leafy vegetables may reduce the risk of type 2 diabetes. Thus the present study revealed the consumption of leafy vegetables reduces the blood sugar level to control diabetes.
Among variety of fruits suggested, the mostly consumed fruits are *Carica papaya*, *Vitis vinifera* and *Musa paradisiaca* which have been consumed by 20, 16 and 4 patients respectively. The effect of these fruits in reducing the blood sugar is maximum in *Carica papaya* followed by *Musa paradisiaca* and *Vitis vinifera* (Table 36b).

The influence of medicinal herbs on blood sugar level has been given in the table 36b and in plates VIII, X, XI. Among the decoction of two medicinal herbs *Eugenia jambo lanana* and *Cassia auriculata* maximum hypoglycemic activity is seen in *Cassia auriculata*. Among other nine antidiabetic herbs, *Cynodon dactylon*, *Gymnema sylvestre* and *Terminalia chebula* have been consumed by maximum number of patients in contrast to *Cuminum cyminum*, *Eugenia jambo lanana* and *Cen tella asiatica* which have been consumed by minimum number of patients. The detail about the consumption of various herbs along with the blood sugar level for all the forty patients has been given in Plate XI. It is to be noted that in patients 2 and 4 who have consumed maximum number of herbs the blood sugar level declined drastically, in contrast to patients 15 and 26, who consumed very few herbs, with moderate improvement.
There are some reports on adjunctive therapy for diabetes, but there are no case studies on patients of type 2 diabetes who had undergone 100% naturopathy treatment. Even in the present study, only 27.5% patients have acquired 100% naturopathy treatment by completely withdrawing previous allopathic treatments. Only 5% of patients continued both allopathic and naturopathic treatment equally. To know the effectiveness on naturopathy in the treatment of diabetes (Type 2) these two extreme groups of patients in the present study can be compared. Initially, 139.33 mg/dl (fasting) and 253.99 mg/dl (post prandial) average blood sugar level were recorded for two patients (5%) who followed previously allopathic treatment alone. Whereas the same patients after following naturopathic treatment along with allopathic treatment integratively, the blood sugar came down to 117 mg/dl (fasting) and 155.83 mg/dl (pp) in three months time. In contrast, the average blood sugar level in 11 patients (27.5%) before coming to naturopathic treatment was 149.42 mg/dl (fasting) and 242.2 mg/dl (pp). When they exclusively followed only the dietary schedule given by naturopaths, the average blood sugar came down to 114.05 (fasting) and 141.60 (pp). Thus the remarkable reduction in blood sugar level in patients with naturopathy treatment only, proves that naturopathy treatment is the best treatment for diabetes without any chance for side effects. In the meantime, it has also been observed that there is also a major difference in the reduction of other diabetic complications in patients with integrative medicine and in patients with naturopathy treatment.
alone (Table 37, Plate IX). After naturopathy treatment, most of the patients are in nil categories of additional complications in contrast to patients before naturopathy treatment with at least mild symptoms of several other complications of diabetes.

According to naturopathy practitioners, foods made of white sugar, oily and fried foods, milk, preserved foods, non vegetarian foods, coffee/ tea / alcohol, starch foods and soft drinks should be avoided. Like that late and irregular time of eating and late night sleep should also be avoided to achieve maximum success of naturopathy treatment. In addition timing is also important. The influence of non dietary factors on the treatment of diabetes has been given in the Plate IX. When considering these factors mild deviation of timings or other factors has no much influence.

Naturopathic dietary treatment for diabetes (Type 2) not only bring down the blood sugar level to normal level, but also recovers the patients from other diabetic complications. The plate XII and table 38 shows the degree of various diabetic complications in patients before and after treatment. Before treatment majority of the patients were under mild complications from 9 for polydipsia to 24 for irritability. But after treatment almost all the patients are under nil categories for almost all the complications, except with the occurrence of mild complications in very few patients for very few complications.
Based on present survey, it is concluded that the naturopathy diet practiced by naturopaths to treat diabetic (Type 2) patients not only bring the blood sugar level to normal condition, but also reduce other complications of diabetes. It is also seen that it is of a highly flexible diet system with more of choices and so if the patient omit one thing it is equaled by taking another food item. In general it clearly shows that the herbs like *Aegle marmelos*, *Gymema sylvestre* and *Emblica* *f* *ebula* act as key medicines directly by enhancing insulin secretion and antioxidant activity while all other foods, particularly pulses, cereals, fruits, vegetables etc. provide balanced and nutrient rich diet which is suitable for diabetes. According to Nettleton *et al.* (2008), the empirically derived dietary pattern characterized by high intake of refined grains, high fat dairy, and red meat is associated with an 18% greater risk. Whereas the empirically derived dietary pattern characterized by high intake of whole grains, fruits, nuts/seeds, green leafy vegetables and low fat dairy is associated with 15% lower diabetic risk. Interestingly, although the type 2 diabetic risk estimates for each of the component food groups are in the direction of general hypothesis, no individual food group is independently associated with type 2 diabetic risk. So, it has been hypothesized that the effects of single foods or nutrient may be too small to detect individually, but their cumulative may be sufficiently large to detect and be deemed statistically significant. The results of the present study in general and with particular reference to diabetes are also in accordance with this hypothesis.
It is concluded with the recent information given by D. Balasubramanian (The Hindu, Dated 7th June, 2012) who has mentioned that modern pharmacology is molecule based, and often single molecule is expected to act usually on a single step in the body physiology, occasionally on a ladder of steps. However, disorders such as diabetes affect a variety of biochemical processes and thus the single-molecule approach is inadequate. It is here that is multi-component mixture becomes useful. The million-dollar puzzle is “which components”.