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ITK, anticancer herbs & phylogeny: A taxonomic approach of APG IV system

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Abstract
Sustainable health is one of the most important issues of the 21st century. The 4th generation healths practices are now become the call of the time due to severe side effects of the conventional health practices as being observed from time to time. The side effects of the antibiotics and steroids do not deserve further exemplification. Cancer is the most important major health concerns today and it is not any single diseases rather it is actually a group of related diseases and it is estimated that about 6 million cases every year, the incidence of the mass killer disease are anticipated to be observed. The types of cancer are near about the number of cell lines of the human beings. The multiple causes of cancer have aggravated the issues more serious. The different internal factors like gene mutations, poor immune system, hormonal issues and the external factors like food habits, life styles, industrialization, over growth of human population along with the growing concern of global warming are the important causes in this concern. The chemotherapy, radiotherapy and chemo-radiotherapy are mostly used for the treatment of this disease. The use of the anticancer plants is not still in practice due to different hidden causes, India is the largest producer of medicinal plants and it is also recognized as "Botanical garden of the World". The different medicinal plants may promote host resistance against the different types of infection by re-stabilizing body equilibrium and conditioning the body tissues. The presence of antioxidants in herbal plants can promote anticancer activity. The medicinal plants are not only easy available but also, these are cheaper with almost zero toxicity and can be addressed by the common people. Preparation of the standardized dosage and the dosage regimen can play a very effective role in the prevention and the curing of the disease. The present paper has tried to explore the diverse medicinal plants used in the traditional knowledge of the health practices along with to find the phylogenic similarities among the plants used in this regard. To find out the potent anticancer agents from medicinal plants along with their phylogeny is very important to explore this domain.

Keywords: Traditional knowledge (TK), cancer, herbs, antioxidants, steroids, bioactive compounds, taxonomy, APGIV

1. Introduction
India is the land of beauty amidst the diversity from the geology to anthropogenic features and it has been rearing its large biological diversity garnished with chemo-diversity since the time immemorial of the ancient time. Traditional knowledge (TK) & Indigenous Traditional Knowledge (ITK) are the important pillars of innovation and practices in the different spheres of scientific inquisitiveness to address the different type of issues almost in all the socio-economic components starting from the food to security, shelter, economy and health practices in the light of sustainability. India is rightly regarded as "Botanical garden of the World" due to its large treasure of the biodiversity in general and phyto-diversity in particular. Plants used in the different human pleasure in general and in TK and ITK, plants have stood up to the test of time. It has contributed a diverse type of novel compounds for the curing and the prevention of the different types of diseases. The gold mine of the plants diversity along with the large endemic plants has drawn the attraction of the scientific fraternity to explore the beauty of these imponderable gifts. Although the large spectacular landscape is the abode of plants diversity, the flora of the great Himalayas is quite famous for its huge biodiversity for the healing of the different types of diseases. The great Himalaya being situated with different altitudinal variations and rocky mountains, plants grow in this area are exposed to different stress factors like higher doses of mutagenic agents including U-V radiation, desiccation and strong winds along the physiological drought and the exposure of the diverse other biological

factors. The stressful environments offer all the biological entities to undergo a number of adaptive features by altering the biochemical profile including the production of diverse secondary metabolites like Polyphenols, terpenes, alkaloids and other diverse types of biochemical attributes. All these biochemical profile plays a very crucial role to develop a number of strong adaptive features against the mutation and madness of the cell and cellular mechanisms. Not only the cancer and other serious health issues, the different common ailments caused by the different pathogens and organic matters derived from the body cell itself, the medicinal plants a very crucial role in this regard. Besides having the natural therapeutic values against the different types of diseases, the plants of these wide geographical zones play a very important role as the repository of the food and the raw materials of the livelihood. These plants also promote the host resistance against the infection of the diverse microbes by restabilizing body equilibrium and the conditioning of the body tissues. The anthropogenic diversity as catered by the vast landscape is the exact repository of the different TK and ITK in this regard and it is believed that the heterogeneous population stretched across the vast landscape play a very significant role by providing the raw information for the user of the medicinal plants for the different diverse types of health issues along with the issues associated with the daily basic needs. Cancer, the mass killer of the 21st century is a kind of pathological condition where the normal cell division of the cells become uncontrolled and proliferated in I unordered manner .Cancer is the most important health issues of today and out of 5, at least one people in the earth has been suffering from the madness of the cell cycle. The uncontrolled proliferation of the cell due to the destabilization of the cell cycle is the only cause in this regard. According to international Agency for research of Cancer (IARC), more than 19.3 million new cancer cases have been reported and 10 million deaths have been reported which is the most alarming statistics in this regard. The global cancer burden will become 28.4 million in the near 2040 and it is about more than 47% rise of the increase of the cancer in comparison to 2020.The different cell lines have different types of cancer related disorders. It may occur at any time and at any stage in any part of the body. The types of cancer are mostly directly proportional to the number of cell lines remain inside the human growing embryo. But the most commonly diagnosed cancers in worldwide are female breast cancer along with lung, stomach and prostrate cancer. Due to the increasing rate of the cancer victims followed by early detection, the number of the % of death has been observing in slow rate and side by side, the molecular and tumor biology has been changed along with the strategies and protocols of the cancer treatments. Biological capabilities of cancer cells to sustain proliferative signaling, insensitivity to antigrowth signals, unlimited potential of the replication module, induction of angiogenesis, active invasion along with the metastasis are some of the cellular and molecular features of the cancer cells. Tumor Micro environment (TME) mostly consists of neoplasts cells such as cancer stem cells endothelial cells, pericytes, immunoinflammatory cells, cytokines, growth factors, chemokinetics that play a significant role in the heterotyping signaling interactions to induce malignancies. Multiple numbers of therapies have been developed to address the molecular features associated with the tumor biology. The cause of the exact occurrence of cancer is still a kind of paradox but it is caused by complex, poorly understood interplay of the environmental and the genetic consequences and become the largest loss of human death even in the age of automation and 5G technology armored with innovation. The unfortunate statistics of cancer sufferings is increasing day by day. Although 1500 anticancer chemotherapeutic agents are available along with more than 500 drugs for the prevention of cancer is under trial, there is a huge concern over the innovation of the much effective and cost friendly least toxic drugs that can address the nightmare of cancer and the plant kingdom rightly play a very significant role in this regard for the treatment of cancer. The concept of therapeutic food has been discussed for a long period of time. Healthy diets of food rich in fruits and vegetables protect the body against cancer. Bioactive compounds usually contain amino acid residues can offer a number of physical effects such as antioxidant, antithrombotic and antihypersensitive activities. The heterogeneous population is another concern that plays a very crucial role for the design and the development of the anticancerous drugs. The Indian flora is the majestic beauty of the naturalists not only for its spectacular beauty but also for its rich bioactive compounds possessed by them due to the diverse harsh climatic and stressful areas that enable the production of large number of secondary metabolites. Although all the plants have some sorts of potential to offer bioactive molecules for the different therapeutic properties, but 8000 plant species are treated globally as medicinal so far knowledge of the exploration is concerned and 50% of the said category of plants are available in the Indian subcontinent. Out of 400 families, 315 families are available in India and beside these values of statistics; more number of plants as far as medicinal plants can be explored if the plants used by the ITK and TK is accounted of in this regard. The different traditional system of medicines in India as exercised for the treatment of diseases like Ayurveda, Unani, and Siddha also consists of a number of herbals that are not included in this beauty of statistical knowhow. The Ayurveda is the most emerging concept nowadays garnished with Yoga can play very source of the pleasure of happiness of the medicinal system and this can offer a bouquet of promise to offer sustainable health in this regard. This system has been accepted globally. The traditional knowledge and Indigenous traditional knowledge as far as medicinal plants history is very rich and being treated as mine of exploration for the invention and designing of the different types of diseases. The rich history of the treasure of the TK and ITK is beyond questionable and the recent years, the research in this field has been expedited by the plant biologists of the different fields in this regard. Not only the East, the western has been using this sustainable resources and this has again raised the different issues of patent and rights by the different stakeholders. The battle of turmeric (Haldi) for copyright is most debatable issues in the recent past. The report of WHO in connection with the herbal drugs are very encouraging. As per WHO, three quarters of the population of the world are currently using the herbs as source of medicines and other traditional medicines in this regard for addressing the different emergent health issues. Even the one of the most developed countries of the world, USA has been using the medicines from the natural sources and it is about more than 50% of the total drugs used by them. A large number of these chemicals have the properties to induce cell death and this property is highly solicited when someone talk about the death of the cancer cells. Cancer is the most addressed issue nowadays and the search for the bioactive compounds for the killer or the suppressor of the malignant cells is one of the important explorations by a number of scientists in the different

domains. Natural products are the most fertile source to the cure the cancer. So, there is a continuous urge for the exploration and the development of the new anticancer drugs along with methodical modification of the use of the drugs is a very important thrust area nowadays. Out of 2, 50,000 plants species so far reviewed, more than 1000 plants possess the anticancer properties. Molecules have the paradise beauty and the wonder of the wonders of these molecules are not less fascinating than the characters of any epics in the literary beauty. So, many molecules which possess these properties or supposed to nourish the property yet to be explored needs further exploration to enrich this domain of the natural bioactive compounds. This review article intends to explore the different types of plants used either in the TK or ITK or by the registered medical persons and the diverse bioactive compounds reared by those plants in this regard. The phylogeny and phonetics are two important domains of the science of the classification of the living organisms. Molecular phylogeny is the most artistic creation of the modern biology to make the relationship between the predecessors and the successors organisms. The phylogenetic and the Phentic classification of the plant kingdom endorse the molecular phylogeny of the chosen elements and the beauty of the classification is used to explore the relationship among them. The bioactive compounds of the different plants having the anticancer properties have been traced by the experts in this domain with the symbiotic understanding of the lot of scientists in this regard. Taxol, the novel biochemical is being used in the treatment of refractory ovarian, breast and other cancer and this is a natural compound extracted from the plant, *Taxus brevifolia* of Taxaceae of Gymnosperms. Podophyllotoxin and its synthetic modification known as Etoposide are now used as an effective molecule for the small cell cancers of lungs and testes. In addition to these, Camptothecin, Vincristine, Vinbalastine, Colchicines, Ellipticine and Lepachol are some of the molecules and these molecules posses the anticancerous properties to inhibit the cancer by the diverse bio-molecular pathways. Thus, it can be stated that more the number of plants are to be screened for the effective anti-cancerous properties, more information to be mined and these plants are to reviewed in the light of phylogenetic and phentic systems to explore the more number of plants that can share some common attributes in the light of molecular phylogeny. This paper has attempted to endorse those plants which might have effective molecules for the treatment of cancer but yet to be explored. Thus, the several bioactive compounds either as food or medicine or both from the plant sources can be sustainable resources to address the human concern along with the study of the phylogeny will open another Avenues to expedite the research of the exploration different other correlated plants in this endeavor.

1.1 Plants used for the treatment of Cancer

Cancer has become nightmare of the every people due to its degree of death toll irrespective of the people's age and it has been affecting the considerable number of people worldwide. Ongoing research is one the way to seek out the effective treatment for cancer. All sorts of the drugs used in chemotherapy have a number of side effects and the post-cancerous stage can jeopardize the life of the cancer patients due to the severe multiple side effects. Scientists are trying to find out any suitable remedial measures that not only solve the cancer treatments but also it can show a ray of hope for the unfortunate people with a life expectancy. The natural bioactive compounds having therapeutic value can offer this ray of hope in this regard. These alternative chemotherapy agents can decrease the harsh side effects and these compounds possess the ability to prevent cancer. The invention and the preparation of the module of the treatment of cancer are very important nowadays in the emerging situation. In all medical treatment procedure before the use of any therapeutic agent need proper trial with almost zero side effects after the use of the drugs to the target entities. So, carful precautions and considerations of all other secondary issues are very important to be addressed in this regard before use of the any therapeutic substances to be used for the same. Some side effects cannot be ruled out but despite the hidden side effects in this regard, and it is important to undergo any medicine prescriptions from the botanicals must follow the licensed medical professional otherwise another unfortunate situation might be happened. A good number of plants possess the anticancer properties and the name of the some of the plants may be stated as *Catharanthus roseus, Selaginella corymbosa, Allium sativum, Solanum nigraum, Helianthus annus* etc.

1.2 Advantages of Herbal drugs over Allopathic drugs

Medicinal plants still play a very significant role in the traditional health care system in general and rural health care practices in particular due to its number of advantages as far as its availability, minimum side effects and cost effective one. Recognition and development of the herbal medicines both by the developed and underdeveloped countries is beyond questionable. A medicinal plant is basically a kind of plant which is used in the health care practices due to its aroma, flavor and therapeutic properties. Products designed and developed either by little fortification are used to maintain and improve health or as health supplements or phytomedicines. The pharmacological treatment of disease is an age old practice with the use crude drugs of vegetable origin along with the use of some animal components. Traditional herbal medicines are mostly naturally occurring plant derived substances with minimal or no processing and these are mainly used in the treatment of the common illness within local or regional healing practices. Significant side effects of conventional therapies vary wildly to severe including insomnia, vomiting, fatigue, dry mouth, diarrhea, constipation, doziness, suicidal thoughts, hostility, depression, coma, anemia, hair loss, blood sugar, impotency, panic attacks, confusion, and even cause death. But the herbal medicines are mostly do not develop such kind of side effects and this has made the use of the herbal medicine as a part of the indigenous medicine for the treatment of the diverse type of diseases.

1.3 Herbal drugs, Taxonomy and Phylogeny

Taxonomy is the branch of biology to explore the systematic knowledge about the biological life forms along with their identification, nomenclature and the classification of the organisms in the different contexts. In any context of the use of the herbal drugs, right identification of the plants along with their proper scientific name with the respective vernacular or local name is very important as the traditional knowledge system mainly deals with the more with the local name than the scientific name. The identification and the nomenclature of the plants always need the classification of the respective plant –either the old one like the artificial or natural system of classification or the advanced system of classification like phylogenetic or phenetic system of the

classification. The modern system of the classification is not only more scientific and reliable due to its molecular approach but also, it enables to strengthen the relationship among the predecessors and successors along with the grouping of those plants that can likely to enjoy a degree of similarity almost in all the respects. Phylogenetics has become a powerful tool in many areas of biology. Land plants are the most important primary producers of terrestrial ecosystems and have colonized various habitats on Earth. In the past two decades, tremendous progress has been made in our understanding of phylogenetic relationships at all taxonomic levels across all land plant groups by employing DNA sequence data. The diverse plant world along with the affinity among them in the light of phylogeny is very difficult issue to address. The gradual development of the knowledge of taxonomy in general and plant taxonomy in particular has tried its best to answer this most embarrassing question. Since time of the Aristotle, the attempts have been taken into account to explore the beauty of the biology of relationship. The eighteenth century of Europe became the centre of this inquisitiveness. C. Linnaeus first attempted to classify almost all the living organisms on the basis of the sexual characters of the different biological life forms.

1.5 Bioactive compounds and Medicinal Herbs

Plant metabolism is one of the most important domains in plant biology and the molecular basis of life and its understanding with the help of molecules has made the avenue of biology more interesting and fascinating to the biologist. In course of the execution of the metabolic activities, most of the living organisms unlike plants produce two types of chemicals- primary and secondary. Primary metabolites are the outcomes of the normal biological process while the secondary one are the outcome of a set of compounds that differ species to species on the basis of their genetic machinery and the abiotic conditions where they are supposed to survive. These secondary metabolites are mostly treated as bioactive compounds and these compounds have nutritional and therapeutic values. Plant secondary metabolites (PSM) are basically small molecules with diverse chemical structures and biological activities. Unlike the primary metabolites, PSMs are neither necessary for primary life functions nor possess high energy bonds. However, PSMs play a very significant role to ensure plant fitness and survival particularly concerning with the ongoing environmental issues like biotic and abiotic stress. They have wide diversity in their structures and functions and rear the potential to serve as chemotherapeutic and chemo-preventive agent in the treatment of the different types of diseases in general and cancer in particular. Phenolics and Flavonoids are well known for their anti-oxidative and anti-inflammatory properties. The most well known PSMs are morphine (isolated from *Papaver somniferum*), digitoxin (*Digitalis purtpurea*), Taxol (*Taxus baccata*), artimisinin (Artemisia *annua*), quinine (Cinchona *officinalis*), Vinbalastine and vincristine (*Catharanthuis roseus*), aspirin (*Filipendula ulmaria*) etc and all these compounds extracted from the natural sources play very significant role in the health and welfare of the common people. In addition to these, these also play a significant role in the production of all such type of chemicals as a part of the interactions of the abiotic and biotic stress experienced by them. The different types of the bioactive compounds are stated as below.

1.5.1 Polyphenols compounds: Polyphenolic compounds are the diverse group of compounds that are present in the natural forms and it caters a wide group of functions. It makes a strong resistance of the plant by pathogens and plays an important function in the growth of the cell. The scientific findings have confirmed its role in its anti- carcinogenic properties like suppression of tumor, metastasis and angiogenesis along with their cardiovascular defence mechanisms. There are basically four classes of compounds- Phenolic acids, stilbenes, lignans and Flavonoids. Dietary Polyphenols have been proven to present carcinogenesis in diverse biochemical processes such as the inhibition of oxidation, promotion of the apoptosis of the tumor cells along with the strengthening of the immune response and anti inflammatory properties. Thus, the plants are the unique source of Polyphenols and these classes of compounds play a very significant role in the prevention of the cancer cells along with the support system to enable strong immune response against any type of disease occurrence either caused by the pathogens or other organic issues.

1.5.2 Flavonoids Molecules

These are another kind of low molecular weight Polyphenols and the natural Flavonoids contain two aromatic rings at both corners and a three carbon ring at the centre that form oxygenated heterocyclic compounds. Anthocyanins are class of Flavonoids molecules that can increase the levels of antioxidant, anti inflammatory and carcinogen deactivating enzymes in cells and can inhibit the growth and spread of the cancer cells. By influencing the gene expression and cell signaling system, it can inhibit the proliferation of cells and the metastasis of cancer. The two representatives of Flavonoids are kaempferol and quercetin, the former inhibits the progression and proliferation of cancer cells while the later can induce apoptosis and DNA damage.

1.5.3. Non-Flavonoids Molecules

Resveratol is one of the most important representative compounds of the stibene family having a high degree of antioxidant property and can scavenge free radicals which are the most important inducer of DNA damage.Lignans are the most important molecule that have the property to increase the levels of antioxidant, anti-inflammatory and carcinogen deactivating enzymes and also induce the apoptosis of the cell. Phenolic acid exert anti-proliferative and pro-apoptotic effects.

1.5.4. Carotenoids

Carotenoids are the category of bioactive compounds and more than 600 types of Carotenoids are found to occur in plants. Carotenes are two types as far as the conjugated double bonds-α carotene and β carotene and mostly found in the green leafy vegetables. High levels of carotenes decrease the rate of mortality, cancer and heart diseases. The carotenes play a very significant role to address the human immune response and fortify the defense mechanisms of the body parts.

1.5.5 Sulfur-containing Compounds

Sulfur containing compounds basically consists of elemental sulfur and it is essential for the biosynthesis of various secondary metabolites and plays a significant role in the cellular activities of the living organisms in general and human in particular. Glutathione is the most important sulfur containing compound and it indirectly plays a significant role in the functioning of protein and enzymes. It also exhibits

cytoprotective activity in the presence of carcinogenesis.

1.5.6 Terpenoid
Terpenoid is the largest compounds and it is class of secondary metabolites derived from mevalonic acid as a part of the biosynthetic pathways for the production of secondary metabolites. This set of compounds is found in almost all living organisms. Due to their diverse biological activities and diverse physical and chemical attributes, it has a lot of anticancer applications in human beings.

1.5.7. Other compounds with Anticancer Effect
In addition to the aforesaid bioactive compounds, different other types of compounds play a very significant role in the regulation of the cell cycle and effect on the different mechanisms associated with the positive effect of anticancer activities and cell proliferation and metastasis. Different dietary fibers can decrease the risk of cancer. Vitamin C is a powerful antioxidant and it protects DNA by trapping free radicals and inhibits the formation of carcinogen. Vitamin D regulates the cell signaling pathway and interrupts the cell cycle by modulating the regulators to induce cell. Melatonin as the ingredients different food stuffs like walnuts, cherries exhibit anticancer activity through antioxidant activity.

2. Anticancer Actions of Bioactive Compounds extracted from Herbs
The treatment strategies of cancer has been changing time to time due to innovation of the different types of bioactive compounds along with new and new information available regarding the pathology of the unfortunate outbreak. Although the mechanisms of cancer are not fully understood, the role of the bioactive compounds to reduce the fate of cancer and effective role for the treatment of this unequal war is still a paradox. In this section, the vitro and *in vivo* studies to control this madness of the cells are explained very briefly with the help of the bioactive compounds extracted from the plant sources.

2.1 Antioxidative Effects
Oxidation is the important biochemical process required for the production of biological energy to drive number of cellular processes. But due to partial exposure of required amount of oxygen, the cells very often suffer from oxidative stress. Reactive oxygen species (ROS) are the set of chemicals that are derived from oxygen and these are Hydrogen peroxide (H_2O_2), superoxide anion radical(O_2^-) , hydroxyl radical(OH), alkoxyl radical(RO) along with peroxyl radical and all these substances play a very critical role in various pathological and physiological processes of the cell. Most of the ROS are generally derived from the electron transport Chain (ETC) during aerobic and metal-catalyzed oxidation. Polyphenols play a very significant role in the scavenging of the free radicals responsible for the destabilizing of the cell cycles.

2.2 Epigenetics
Without the change of the sequences of DNA, a series of heritable changes in the gene expression takes place either due to DNA methylation and histone modifications. The current investigations have revealed the process of hypermethylatiuon and hypomethylation that are responsible for neoplastic process and the promotion of carcinoma expression. Several bioactive compounds have the potentiality as anticancer property by influencing the epigenetic processes including Vitamin B-12 and Folate although these are basically used as the nutrition's supplements. The Polyphenols could also regulate the epigenetic process to carry out their anticancer interactions. There are lots of bioactive compounds that can regulate gene expression by altering the post-transcriptional modifications of histone like Butyrate. It can cause cell growth arrest at the G_2 stage by inducing apoptosis. The different anticancer compounds like antioxidants have the regulatory role of the epigenetic processes. Terpenoid are the class of chemicals that can also regulate the epigenetic processes by playing a positive role to suppress the cancerous madness of cell. Not only that, the different natural mixtures of the bioactive compounds have a significant positive role in the in the epigenetic processes to regulate the cancerous cells to behave as normal one. But it is very necessary to determine the effective dose and the concentration of the compounds in due course to regulate the epigenetic processes and to induce apoptosis.

2.3 Transcription Factors
Chronic inflammation can expedite the initiation and development of carcinogenesis. Tumor biology comprises a number of steps that account of cellular transformation, proliferation and metastasis. The target of inflammation plays a significant role in the therapeutic pathways in the treatment of cancer. Although a number of factors are the issues but the major concern is the transcription factors and this has got the interest among the biologists for the regulation of the pathways. Currently, a number of bioactive compounds have been identified to modulate the transcription factors for the regulation of the tumor induction and other biological events related to onset of cancer. Curcumin is one of the bioactive compounds that possess the ability the transcription factor to stop the tumor and its related issues in the cell cycle.

2.4. Modulation of Gut Microbiota
Human Gastro Intestinal tract (GI) is the safe repository of 100 trillion microbes from almost nearly 1000 different species to maintain the integrity of the intestinal mucosal barrier and to digest the fibers and of bioactive compounds. The gut Microbiota is also responsible for the homeostasis of the human immune system. The gut Microbiota can be influenced and modified by aging, dietary compounds and antibiotics. A healthy diet garnished with rich dietary fibers can maintain a strong Microbiota ecosystem within the GI tract. Different bioactive compounds like Polyphenols have the potential to regulate the balance and composition of the gut Microbiota. Moreover, the actions of Polyphenols have also the effective role in the inhibition of different cancer related issues. Bioactive compounds consumed by the human beings inhibit angiogenesis and other inflammatory factors. Many metabolites may undergo cleavage by methylation, glucroindation, glycination and sulfation in the liver cells. These compounds have strong effective role in the regulation of cell division and apoptosis by reducing oxidative damage and proinflammatory mediators. The gut Microbiota is also associated with chemotherapy and methanotherapy for cancer Thus, in a word, it can be concluded the bioactive compounds and gout Microbiota play a very significant role in the regulation of the cancer cells and these are very important in the inhibition of cancer cells and its associated biochemical pathways.

2.5. ER Stress
Endoplasmic reticulum (ER) is vital for the protein synthesis,

cholesterol biosynthesis and Calcium signaling in the cell system. ER environmental biosynthesis is crucial for maintaining the different physiological functions of cells. It has been reported that hypoxia, ROS and nutrients deprivation can induce the disturbances and create the hazards for maintain the homeostasis of the functioning of ER. The accumulation of unfolded proteins in the ER is caused due to impaired ER protein folding environments and this many create a long issue in the regulation of the cell cycles molecular pathways. This is called ER Stress. The various studies have confirmed the ERS involvement of in cancer and many ERS related proteins like glucose-related protein 789 (GRP78), binding protein (BiP) and activating transcription factor 6 (ATF6) are involved in the induction of the different types of cancer. The studies have the involvement of Curcumin could induce ERS-mediated apoptosis and the natural bioactive compounds from herbal sources play a significant role for the regulation of tumor biology.

2.6. Inhibition of Cancer Stem cells

Stem cells are the unique set of cells that possesses the property to multiply and renewed time and gain to form set of cells and leads the formation of the diverse cell lines. Cancer Stem Cells (CSCs) play a very distinctive role in the development of cancer. CSCs have characteristics of self renewal and multidirectional differentiation along with infinite proliferation property and these cells have the escaping tendency to chemotherapy drugs along with high degree of tumorgenicity. These cells also possesses invasiveness and metastatic abilities and not to undergo arresting the divisional pattern under any circumstances. Researches from the different sources confirmed the role of the bioactive compounds such as Polyphenols and Flavonoids to inhibit the propagation of cancer and be the potential drugs to target CSCs.

2.7. Antiangiogenesis

Angiogenesis is one of the dreadful mechanisms of cancer cells of almost all types of cancer cell lines. Vascular endothelial growth factor (VEGF), basically a cytokine produced by the tumor cells play a vital role during the angiogenesis. So the inhibition of cytokine by regulating VEGF is very important to block the pathways and the related pathway to stop energy supply of the immortal cell lines. Although the monoclonal antibody is basically used for the same right now to stop angiogenesis but diet- derived phytochemicals can play a very significant role in this regard. More researches are welcome to find the similar type of phytochemicals by the study of phylogeny of herbs and this can show a ray of hope in this regard as a new horizon in the cancer biology.

The biology of tumor and its related mechanisms along with cell proliferation, apoptosis, angiogenesis and other is still not cleanly explored and the different types of cancer along with the associated cell lines are still a kind of mist amidst the scientists but ray of hopes are there accompanied with modern techniques to unlock the issues of great concern.

3. Herbs with anticancer therapeutic values & ITK

The plant kingdom represents the symbol of number of tangible and intangible benefits since the time immemorial. Health care practices are one of the important socio-economic components of the earth particularly for the poor and marginal class where the fruit of development is yet to be reached. Therefore, the ill fated people still depends on the medicinal plants for the physical and mental well beings. In addition to that, the privileged society has assessed the side effects of the conventional health care issues and the attention of this affluent society has been reached to the non-conventional medical practices. Since the adaption on agrarian civilization 10,000 years back, people become habituated to use the plants not only for food, shelter but also for the security and survival against the different type of diseases in the domain of health care practices. The ethno botanical survey can offer a wide opportunity to get clues for the development of drugs for the treatment of diverse diseases in general and cancer in particular. As a consequence, the cost effective, safe and easy accessible remedies become very popular in general and the aboriginal people in particular. The two Asian countries China & India deserve special mentioning for its huge biodiversity resources, large population along with diverse geological and anthropogenic attributes. The indigenous traditional knowledge on medicinal plants for the preparation of health care products has gained a considerable importance and this has been further expedited due to the different type of side effects as visualized by the people in general and developed countries in particular. The new domain of medicinal field has been emerged and the complementary Alternative medicine (CAM) has become very popular for its holistic attributes. The health tourism has been become very popular in this context. India rears a proud privilege to be rich in biodiversity possess about 8% of the estimated biodiversity of the world with around 12000 species. It is one of the 12 mega biodiversity covers. Over 53.8 million (7%) tribal people are there in the Indian subcontinent belonging to over 898 communities along with 106 linguistic groups and 227 subsidiary dialects group. The tribal groups distributed in diverse rich areas possess a wealth of knowledge and skills as far as the utilization and conservation of the eroded knowledge of medicinal importance. As far as WHO, about 65% of the world's population has incorporated the importance of plants as ingredients of medicines as their modality of heath care practices and about 25% of the modern drugs are highly indebted to the plants sources. This confirms the immense role of the plants in the formulation of natural products based pharmaceuticals. Plants are the symbol of the wide diversity of natural products that play a very crucial role to make the shape of the present world not only to meet up the needs of food but also to ensure the sustainability of the human civilization since the time immemorial. The plant derived natural products are the outcome of the secondary metabolic products produced by themselves for the sake of their own survival along with to extend a multidimensional role to its dependence in general and human in particular. The knowledge of this natural plant based products have been started since the inception of the crop domestication long before the 10000 thousand years back. The domestication of the wild crops laid the foundation of the bio-active compounds since that period due to their easily availability in the immediate environment. The traditional knowledge is essential for the food security and health of the millions in the developing world. The knowledge comprising the plants source having bio-active compounds laid the foundation of the ethno medicine and the species are selected from they were the unwanted plants as defined as weeds. Weeds species mainly interfere the growth and the productivity of the standing as well as the desirable plants and it was restricted in certain patches over the passage of the time. But now days, a global interest has been developing, so that people may be benefitted from an aspect that has been ignored for a long

period of time due to the advent of the modern science and technology. Weeds mainly resistant to the different type of insects ad plants although it may have allelopathic effect upon the other plants particularly it is a case of the standing crop. The tribal population being the primary inhabitants of the natural habitats in the forest ferny floor hold a tremendous amount of the repository of this valuable knowledge of this medicinal potentialities and this potentiality have greater importance to the modern days particularly when the use of the theirs generation of the medicines have been producing a number of side effects. Ethno medicinal exploration of the pharmaceutically important plant species for the sake of the ex-situ conservation is very important to minimize the genetic erosion. The herbal medicines as available from the natural sources are very much cheaper and eco-friendly gaining tremendous importance now-a- days both in the developed and developing as well as underdeveloped economy. India, being the of the biodiversity hotspots of the world having 5% of the world's biodiversity comprising of only 2% of the world's surface but only contribute only about 2% of the medicinal plants as far as use is concerned. India, being the largest tribal population in India is comprising of nearly 8% of the total population(104 Million) with 573 communities heterogeneously distributed mostly in the states of Orissa, Maharashtra, Madhya Pradesh, Bihar and Jharkhand(Census, 2011) and these tribal groups nourishes their usual customs ad beliefs for the different livelihood aspects in general and healthcare system in particular. Most of the traditional knowledge regarding the healthcare system in general and cancer in particular reared by them is generally verbal and non-documented transmitted from generation after generation. At the present scenario, there is a worldwide movement for assessing the plant resources to find out those plants which have economical value in general and potentiality in health care system in particular. The traditional knowledge system is very rich due to the diverse plant resources and the potential resources to be evaluated properly prior to their erosion at the aegis of the globalization and market economy for the sake of industrialization and anthropogenic unlawful activities. More than 100 plants and the phylogenetic relationship with the help of APG IV system of classification among them have been analyzed here to construct the relationship among the plants in this regard. The APG IV system of classification is the most phylogenetic one that can assess the predecessors-successors relationship with the help of molecular phylogeny along with the strong foundation of the conventional system of classification using morphological parameters as the foundation for the same.

The common name, scientific name, English name, family and the used parts for the extraction of bio-active compounds as therapeutic substances are enlisted below along with their analysis stated below.

Table 1: Inventory of Plant Species, Their Scientific Classification, and Plant Parts Used

Sr. No.	Common Name	English Name	Scientific name	Family	Used Part
1.	Bhindia/Okra	Ladies finger	*Abolmoschus esculentus* L.	Malvaceae 1	Fruit
2.	Baragamchi	Red bead tree	*Adenanthera pavonina* L.	Fabaceae	Bark, seed
3.	Chirchira	Prickly chaff flower	*Achyranthus aspe*ra L.	Amaranthaceae	Whole plant
4.	Bel	Wood apple	*Aegle marmelos* (L.) Correa	Rutaceae	Leaves & Fruits
5.	Rambans	Century plant	*Agave americana* L.	Asparagaceae	leaves
6.	Neelkantha	Bugle weed	*Ajuga parviflora* Benth.	Lamiaceae	Leaves
7.	Payaz	Onion	*Allium cepa* L.	Liliaceae	Bulb
8.	Rasun	Garlic	*Allium sativum* L.	Liliaceae	Bulb
9.	Lainka	Himalayan onion	*Allium wallichii* Kunth.	Liliaceae	Leaves
10.	Maniphal	Custard apple (Hybrid)	*Annona atemoya*	Annonaceae	Leaves, Flowers, tubers
11.	Custard apple	Custard apple	*Annona squamosa* L.	Annonaceae	Leaves, stems, Barks
12.	Katella	Mexican Poppy	*Argemone mexicana* L.	Papaveraceae	Seeds
13.	Ghitkumari	Aloe	*Aloe vera* (l.) Burm.f	Liliaceae	Leaves
14.	Chatim	Saptaporni	*Alstonia scholaris* (L.) R.Br.	Apocynaceae	Whole plant
15.	Soursop	Graviola	*Annona muricata* L.	Annonaceae	Fruit
16.	Strawberry tree	Strawberry	*Arbutus andrachne* L.	Ericaceae	Leaves, Barks, Stems
17.	Ratanjot	Royle	*Arnebia euchroma* (Royu) Jonst.	Boraginaceae	Whole plant
18.	Sabah	Breadfruit	*Artocarpus obtusus* Jarrett.	Moraceae	Stem, Bark
19.	Akoigun	Pipe vine	*Aristolochia ringens* Vahl.	Aristolochiaceae	Roots
20.	Kunja	Indian wormwood	*Artemisia niligirica* L.	Asteraceae	Leaves, stems
21.	Satawar	Asparagus	*Asparagus racemosus* Wild.	Liliaceae	Roots
22.	Jer.Java	Oat	*Avena sativa* L.	Poaceae	Seed
23.	Neem	Neem	*Azadiracta indica* A. Juss.	Meliaceae	Whole plant
24.	Bramhi	Water hyssop	*Bacopa monnieri* (L.) Pennel.	Scrophulariaceae	Whole plant
25.	Kachnar	Orchid tree	*Bauhinia variegata* L.	Fabaceae	Roots
26.	Warty birch	Silver birch	*Betula pendula* Rath.	Betulaceae	Leaf
27.	Barberry	Indian Barberry	*Berberis aristata* DC.	Berberidaceae	Bark, Stem
28.	Sayaphadi	Winter Begonia	*Bergenia ciliate* Sternb.	Saxifragaceae	Rhizome
29.	Bhojpatra	Himalayan Birch	*Betula utilis* D. Don.	Betulaceae	Bark
30.	Sanbong	Night camphor	*Blumea balsamifera* (L.) DC.	Asteraceae	Leaves
31.	Sarson	Mustard	*Brassica campestris* L.	Brassicaceae	Seed oil
32.	Pattagobi	Cabbage	*Brassica oleracea* L.	Brassicaceae	Leaves
33.	Palas	Flame of Forest	*Butea monosperma* (Lam.) Taub.	Fabaceae	Whole plant
34.	Arhar	Pigeon pea	*Cajanus cajan* (L.) Milsp	Fabaceae	Leaves
35.	Chay	Tea	*Camellia sinensis* (L.) Kuntze.	Theaceae	Leaves
36.	Happy tee	NA	*Campotheca acuminata* Decne.	Nyssaceae	Leaves, buds
37.	Akha Madar	Apple of Sodom	*Calotropis procera* (Aiton) W.T. Aiton	Asclepiadaceae	Root

38.	Ganja	Marijuana	*Cannabis sativa* L.	Cannabaceae	Leaves
39.	Hari mirch	Green chili	*Capsicum frutescens* L.	Solanaceae	Fruit
40.	Sweet Mirch	Sweet & Chili Pepper	*Capsicum annum* L	Solanaceae	Fruit
41.	Senna	Alexandrian Seena	*Cassia senna* L.	Fabaceae	Leaves
42.	Sadbahar	Madagascar periwinkle	*Catharanthus roseus* (L.) G Don.	Apocynaceae	Whole plant
43.	Jyotishmati	Black oil plant	*Celastrus paniculatus* Wild.	Celastraceae	Seed
44.	Debdaru	Deodar	*Cedrus deodara* (Roxb.) G. Don.	Pinaceae	Needle, Leaves, Stems
45.	Darchini	Cinnamon	*Cinnamomum zeylanicum* Blume.	Lauraceae	Bark
46.	Santra	Wild lemon	*Citrus medica* L.,	Rutaceae	Root, Fruits, Leaves
47.	Oduvum	NA	*Cleistanthus collinus*	Euphorbiaceae	All parts
48.	Jakniya	Tik weed	*Cleome viscosa* L.	Cleomiaceae	Bark, whole plant
49.	Naked ladies	Naked ladies	*Colchicum autumnale* L.	Liliaceae	Seed , Flower
50.	Dhaniya	Coriander	*Coriandrum sativum* L.	Apiaceae	Leaves, fruits
51.	Haldi	Turmeric	*Curcuma longa* L.	Zingiberaceae	Rhizome
52.	Buno Haldi	Wild turmeric	*Curcuma aromatic* Salisb.	Zingiberaceae	Rhizome
53.	Gajar	Carrot	*Daucus carota* L.	Apiaceae	Root, Leaves
54.	Chalta	Elephant apple	*Dillenia indica* Linn.	Dilliniaceae	Stem, Bark
55.	Tairu	Asiatic Yam	*Dioscorea tubiflora*	Dioscoriaceae	Roots, Rhizomes
56.	Persimon	Gaub Persimon	*Diospyrous peregrine* (Gartn.) Gurke	Ebenaceae	Stem, leaves
57.	Bhringraj	Trailing Eclipta	*Eclipta alba* L.	Asteraceae	Gum, resin
58.	Amla	Indian gooseberry	*Embelica officinalis* Gaertn.	Euphorbiaceae	Fruits
59.	Helencha	Buffalo spinach	*Enhydra fluctuans* Lour.	Asteraceae	Whole plant
60.	Cactus	Indian Spurge tree	*Euphorbia antiquorum* L.	Euphorbiaceae	Leaves
61.	Dudhi	Garden spurge	*Euphorbia hirta* L.	Euphorbiaceae	Whole plant
62.	Bar	Banyan tree	*Ficus benghalensis* L.	Moraceae	Bark, latex, Leaves
63.	Buckwheat	Japanese Buckwheat	*Fagopyrum esculentum* (Lehm.) Manse. Ex. Hammer	Polygonaceae	Hull seed
64.	Wild strawberry	Wild Strawberry	*Fragaria vesca* L.	Rosaceae	Fruit
65.	Tamal	Egg tree	*Garcinia xanthochymus*	Clusiaceae	Fruits
66.	Agnisikha	Glory lily	*Gloriosa superba* L.	Colchicaceae	Rhizome
67.	Liquorices	Yasthimadhu	*Glycyrrhiza glabra* L.	Fabaceae	Root
68.	Soybean	Soybean	*Glycine max* L.	Fabaceae	Seed, oil
69.	Para rubber tree	Rubber tree	*Hevea brasiliensis* Mull.Arg	Euphorbiaceae	Whole plant
70.	Danti	Purging nut	*Jatropha curcas* L.	Euphorbiaceae	Leaves, Seed, Oil
71.	Kalmashi	Water willow	*Justicia procumbens* L.	Acanthaceae	
72.	Putus	Wild sage	*Lantana camara* L.	Verbenaceae	Whole plant
73.	Masur	Lentil	*Lens culinaris* Medicus.	Fabaceae	Seeds
74.	Tamatar	Tomato	*Lycopersicon esculentum* L.	Solanaceae	Fruits
75.	Mahua	Butter tree	*Madhuca longifolia* (J. Konig)	Sapotaceae	Flower
76.	Pudina	Garden mint	*Mentha pulegium* L.	Lamiaceae	Aerial parts
77.	Lajjavati	Touch-me-not	*Mimosa pudica* L.	Mimosaceae	Whole plant
78.	Four o' clock	Sandhyamalati	*Mirabilis jalapa* L.	Nyctaginaceae	Whole plant
79.	Karela	Bitter Gourd	*Mormordica charantia* L.	Cucurbitaceae	Fruits
80.	Nani plant	Mulberry	*Morinda citrifolia* L.	Rubiaceae	Fruit
81.	Sajne	Drumstick	*Moringa oleifera* Lam.	Moringaceae	Fruit
82.	Lebu pudina	Lemon mint	*Monarda citridora* Cerv. Ex.Lag.	Lamiaceae	Whole plant
83.	Kela	Banana	*Musa sapientum* L.	Musaceae	Fruit pulp
84.	Tambaku	Tobacco	*Nicotiana tabacum* L.	Solanaceae	Leaves
85.	Kamal	Lotus	*Nelumbo nucifera* Gaertn.	Nymphaceae	Fruit
86.	Karabi	Oleander	*Nerium indicum* L.	Apocynaceae	Roots
87.	Tulsi	Basil	*Ocimum sanctum* L.	Lamiaceae	Leaves
88.	Ochrosia	Ochrosia	*Ochrosia elliptica* L.	Apocynaceae	Bark
89.	Chaval	Black Rice	*Oryza sativa* L.	Poaceae	Fruit
90.	Bhui Amla	Tone Breaker	*Phyllanthus amarus* Schum & thorn	Rubiaceae	Fruit & seeds
91.	Gol marich	Black pepper	*Piper nigrum* L.	Piperaceae	Whole plant
92.	Chitrak	Ceylon leadwort	*Plumbago zeylanica* L.	Plumbaginaceae	Root
93.	Bon kakri	Himalayan May apple	*Podophyllum hexandrum* Royle.	Berberidaceae	Rhizome
94.	Bharangi	Stem less Premna	*Premna herbacea* Roxb.	Verbenaceae	Root
95.	Madan phal	Emetic nut	*Randia dumetorum* Linn. Sans.	Rubiaceae	Fruit & seed
96.	Mooli	Radish	*Raphanus sativus* L.	Brassicaceae	Roots
97.	Rari	Castor oil	*Ricinus communis* L.	Euphorbiaceae	Seed
98.	Rangua	Indian madder	*Rubia cordifolia* L.	Rubiaceae	Root
99.	Bhelwa	Marking fruit	*Semecarpus anacardium* L.	Anacardiaceae	Fruit
100.	Oblong leaf salacia	Saptrangi	*Salacia oblonga* Wall.	Celastraceae	Whole plant
101.	Doodh patra	Milk thistle	*Silybium marianum* (L.) Gaertn.	Asteraceae	Whole plant
102.	Ban kakri	Himalayan May apple	*Sinopodophyllum hexandrum* (Royle.) T.S. Ying	Berberidaceae	Whole plant
103.	China root	China- root	*Smilax china* L.	Smilacaceae	Rhizome
104.	Kakmachi	Black nightshade	*Solanum nigrum* L.	Solanaceae	Tuber

105.	English yew	Common yew	*Taxus baccata* L.	Taxaceae	Whole plant
106.	Himalayan Yew	NA	*Taxus wallichiana* Zucc.	Taxaceae	Inner bark
107.	Arjuna	Arjuna	*Terminalia arjuna* (Roxb.) Ex. Dc) Wight & Arn.	Combretaceae	Bark
108.	Gulancha	Gulancha	*Tinospora cordifolia* (Wild.) Miers.	Menispermaceae	Leaves
109.	Methi	Fenugreek	*Trigonella foenumgraecum* L.	Fabaceae	Leaves & seeds
110.	Kandali	Common nettle	*Utrica dioica* L.	Urticaceae	Roots, Stems, Leaves
111.	Misletone	Misletone	*Viscum album* L	Loranthaceae	Whole plant
112.	Angour	Common Grapes	*Vitis vinifera* L.	Vitaceae	Fruit
113.	Nishinda	Chaste tree	*Vitex rotunidifloia* L.	Lamiaceae	Flowers and leaves
114.	Aswagandha	Indian ginseng	*Withania somnifera* (l.) dunal	Solanaceae	Root
115.	Adrak	Zinger	*Zingiber officinale* Roscoe	Zingiberaceae	Rhizome
116.	Deerberry	Deerberry	*Vaccinium stamineum* L.	Ericaceae	Fruit

Families contribute maximum number of plants (%)

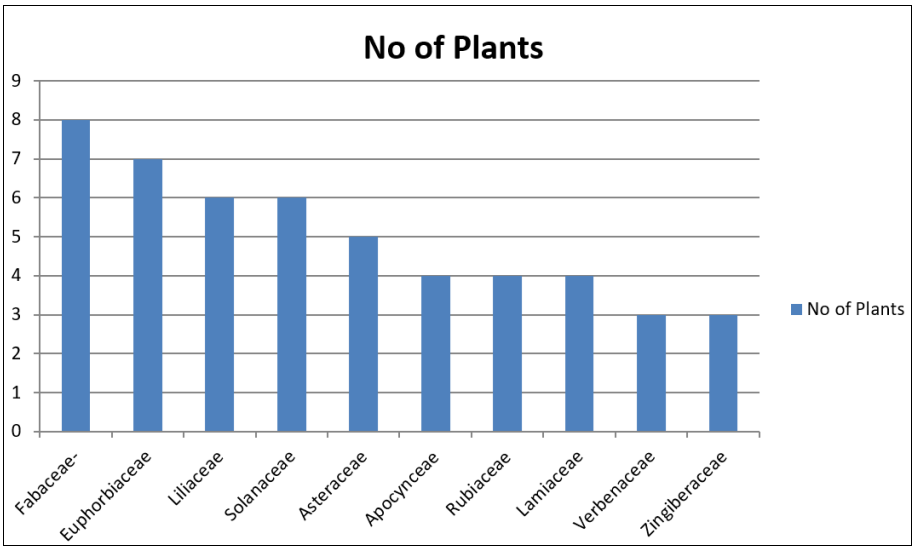

Fig 1: Plants part possesses the bioactive compounds:

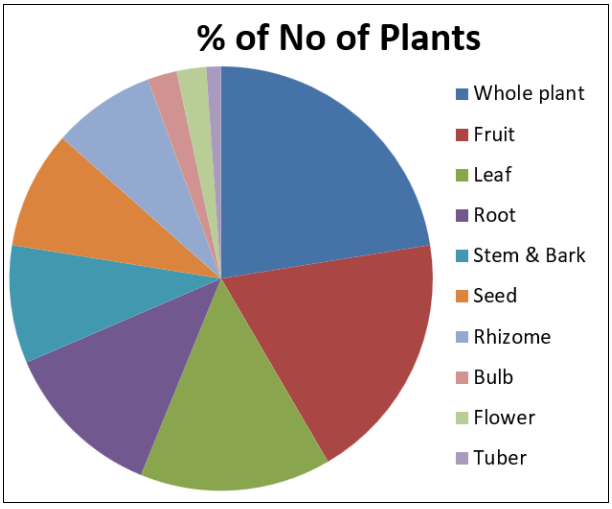

Fig 2: Distribution of different plants belongs to different families as per evolutionary consequences

The origin of plants on the basis of evolutionary sequences is a very difficult to address due to lack of adequate fossil records to trace the close aligned groups in the context of the angiosperm evolution. Molecular phylogenetic studies empowered with the different data sources taken from the different domains of biology little bit confirm the origin of angiosperms from the gymnosperms more 300 million years (MYA) ago. The different approaches of line of the classification of plants on the basis of evolutionary sequences have been started long before but no consensus efforts have been found as the different line of researches took on the basis of different line of parameters. The APG system of the classification of the plant kingdom in general and angiosperms in particular is truly a holistic one to address the 'abominable mystery'. The relationship among the different plants that share some common properties in general and the secondary biochemical constituents in particular is very important in order to find out the suitable alternative of the pre-existing one when there is a emergent need to find out the right substitute for the same. The APG system of classification in general and APG IV in particular basically advocates the plants phylogeny on the basis of the molecular phylogeny. T basically aims for the consensus system of plant classification on the basis of phylogenetic evidences by organizing the plants into monophyletic group, Clades as a part of the improvement of consistency and accuracy. The genetic information embedded into the helix of life, DNA and the molecular similarities has been taken into account for developing the system of classification. Angiosperms include over 295,000 living species the two major groups- monocots and Eudicots mainly possess all the living angiosperms here. On the basis of the following features like carpel with stigma, two ovules with integuments, double fertilization with endosperm, pollen sacs four with paired forms, three-nucleate micro-gametophyte, four nucleate mega-gametophyte, phloem with sieve elements and companion cells, eight distinct groups have been created- Amborellales, Nymphaeales, Austrobaileyales, Chloranthales, Magnoliids, Monocots, Ceratophyllales and Eudicots. ANA Grade is the key component of APG IV system and here, Amborellales, Nymphaeales and Austrobaileyales are three groups constitute

ANA. Amborellales mainly represents the plants of fossils of ancient cretaceous groups but the Nymphaeales and Austrobileyales act as the leading groups to constitute the modern day's angiosperms. Members of Amborellales do not contribute the plants that represent the any remarkable species for the therapeutic compound having anticancer properties. Magnoliids constitute more than 10000 species divided into four orders, Canellales, Laurales, Magnoliales and Piperales. The families of these four orders constitute some species that possess a little bit anti-cancerous compounds. Monocots are the largest clades of angiosperms after Eudicots as far as APG IV system of classification is concerned. The largest family Orchidaceae with 28000 species of 730 genera contains certain types of secondary metabolites possessing little bit therapeutic value. The second largest family is Poaceae with 780 genera and 12000 species also deserves mentioning in this regard. The other members of Bromeiliaceae, Zingiberaceae and Liliaceae can also be mentioned here. The Eudicots, the largest group of angiosperms consists of 44 orders and 2, 10, 000 species as par the APG IV system of classification. The origin of monocots are thought to be monophyletic one but the dicots are treated as paraphyletic one. The Eudicots include five basally-diverging orders Rananculales, Proteales, Trichodendrales, Buxales and Gunnerales. The three large families like Asteraceae, Fabaceae and Rubiaceae mostly consists of more than 25% of species of this domain. It has been found on the observation that the majority of the families that contain the anti-cancerous compounds as far as the statistical information received from the same belong to the major families of Eudicots. The most of the plant families belong to Eudicots but no individual family shares major contribution in this regard. So, anti-cancerous compounds distribution is not homogenous, rather they are distributed mostly almost all the families as per the data available in this regard. Most of the members are terrestrial in nature. The distribution of the biochemical compounds with anti-cancerous compounds is not restricted to any typical arts of the plant; rather they are distributed in the different parts irrespective of their morphological nature. In addition to these, the plant evolutionary significance does not match with the nature of the chemo-diversity as far as the therapeutic compounds are concerned.

4. Conclusion & Comment

The Indigenous knowledge system of medicinal plants in general and anti-cancerous plants wealth in particular has been a great value especially it can explore the road for the discovery of the new single molecular medicine as a part of the modern system of medicine o achieve sustainable health for all. The widening of the horizons of drug discovery and development to address the number of health issues is the call of the time. Molecular phylogeny is the most dependable tool in this regard to find out the plants having therapeutic values for the treatment of the different incurable diseases are essentially needed right now. It has been estimated that more than 70-80% of the world population depends on the crude drug to address the health problems in order to achieve sustainable health and to mitigate the toxic effect developed by the use of the synthetic drugs for the same. Not only are the underdeveloped and developing countries across the globe, the economically developed countries also expanding their interest for the herbal drugs popularly known as phytomedicines. The identification of the correct plants and the characterization of the right cultivars for the right sources of phytomedicines was a problem for a long time. But the recent trends of the identification process by DNA fingerprinting, analysis of multi-component mixtures by using LC-MS-MS spectrum are now considered as the mostly convenient approaches in this regard. The individual screening of the plant for the exploration of the desired drug candidates still is a matter of great concern of almost all the people. The APG IV system of classification can be used as the most convenient tool for the identification of the drug plants based on the screening of the molecular approach can be aided advantage in this regard. The most convenient system of this classification to enumerate the drug plants on the basis of the molecular phylogeny can shorten the research period in the context of the exploration of the desired drug plants for the same as a part of the screening of the drug plants on the basis of molecular phylogeny. The different plants are the treasure of diverse types of Biomolecules having therapeutic potential value. The individual plant study along with the estimation and analysis of chemo-diversity is a serious challenge to find out the drug candidates for the same. The demand of anti-cancerous drugs from the herbal plants is getting much more importance in this regard. The review paper deals with the understanding and analysis of the plants and their phylogenetic relationship to find out the close related species possess the same kind of potential to choice the herbals for the same.

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