# **Natural Herbs as Anticancer Drugs**

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*Abstract*: This article has been with the aim to review some medicinal plants used in various types of cancerous diseases in relation with treatment as well as prevention of cancer. as cancer is worldwide threat to human beings and there are no of therapies are available such as chemotherapy, antibiotic therapy, immunotherapy etc, but problem with these therapy are they are costly, side effect ,pain-full etc. Herbal treatment having less side effect and they are economic ,easily available.

#### Key word - cancer , herbal drugs , Bioactive compounds, medicinal plant.

#### **INTRODUCTION**

Natural products especially plants have been used for the treatment of various diseases for thousands of years. Terrestrial plants have been used as medicines in Egypt, China, India and Greece from ancient times and an impressive number of modern drugs have been developed from them. The first written records on the medicinal uses of plants appeared in about 2600 BC from the Sumerians and Acadians .[1]

Cancer cells usually invade and destroy normal cells. These cells are born due to imbalance in the body and by correcting this imbalance, the cancer may be treated. Ayurveda, a traditional Indian medical practice using plant drugs has been successful from very early times in using these natural drugs and preventing or suppressing various tumours with different lines of treatment.[2] In India, people of different ethnic groups inhabiting various terrains, possess their own distinct culture, religious rites, food habit and a rich knowledge of traditional medicine.[3] Plants keep on serving as could be allowed hotspots for new medications what's more, chemicals got from different parts of plants.[4] What's more, herbs have given us a portion of the essential life sparing medications utilized as a part of the armamentarium of cutting edge medicine.[5]

In recent years there has been a gradual revival of interest in the use of medicinal plants in the developing countries because herbal medicine have been reported safe and less or without any adverse effect especially when compared with synthetic drugs. Herbal medicines represent one of the most important fields of traditional medicines all over the world, to promote the use of herbal medicine and to determine their potential as a source of new drugs. It is essential to study medicinal plants which have folklore reputation in a more intensified way. Human beings have used the plants for medicinal purposes for centuries of the world including countries in the Indian sub-continent like India, Pakistan and Bangladesh [6].

The effort to find anticancer agents from higher plants was launched by the US National Cancer institute (NCI) in 1957. Today many of the most useful and curative anticancer drugs are derived from natural products. Since the initiation of program by NCI more than 35,000 plant species had investigated and resulted in the discovery of anticancer drugs such as Vincristine, Vinblastine, Taxol, Indicine - N - oxide, Etoposide analogs, Camptothecin and analogs etc.

India is the largest producer of medicinal plants and is rightly called the "Botanical garden of the World". The medicinal plants, besides having natural therapeutic values against various diseases, also provide high quality of food and raw materials for livelihood. Considerable works have been done on these plants to treat cancer, and some plant products have been marketed as anticancer drugs, based on the traditional uses and scientific reports. Medicinal plants have been stated [7] to comprise about 8000 species and account for approximately 50% of all the higher flowering plant species of India.

In other words, there are about 400 families of the flowering plants; at least 315 are represented by India. Medicinal properties of few such plants have been reported but a good number of plants still used by local folklore are yet to be explored. The Western use of such information has also come under increasing scrutiny and the national and indigenous rights on these resources have become acknowledged by most academic and industrial researchers. According to the World Health Organization (WHO), about three quarters of the world's population currently use herbs and other forms of traditional medicines to treat diseases. There are at least 250,000 species of plants out of which more than one thousand plants have been found to possess significant anticancer properties [8].

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8     Astragalas membranaesus     Papilionaccae     Swainsonine       9     Agapanthus africanas     Agapanthus africanas     Agapanthus africanas     In Betula autis       10     Aghala sylvestre     Meliaceae     Silvesterol       11     Betula autis     Betula cecae     Betulan       12     Camella sinensis     Tracecae     Ergallocatechin gallate       13     Caharanthus     Apocynaceae     Vinblastine, Vincristine       14     Hedyotis diffusa     Oocystaceae     Patielocatechin gallate       12     Camella sinensis     Tracecae     Ergallocatechin gallate       13     Catharanthus     Apocynaceae     Vinblastine, Vincristine       14     Hedyotis diffusa     Oocystaceae     Vinblastine, Vincristine       15     Colchicum     Liliaceae     Colebicines demevolcine       16     Controtsum     Combritaceae     Safrand, Crocetin, Crocin       17     Corcus sativas     Iridaceae     Safrand, Suin       18     Eshinacea     Asteraceia     Ambiogadatun       agustifolia     Jeguminosae     Zine, selentum, Viannis (A, BI, B2, B12, C, D, E and K)       19     Faogorynin     Polygonaccaa     Amygalin, Ruin       20     Giveyniniza     Agaraceae     Consypol       19     Fa	7		Compositae	
9     Agapanthus atricanus     Agapanthuscac     Isoliquiritigenin       10     Aglaila sylvestre     Meliaceae     Silvesterol       11     Betula utilis     Betulaccae     Betulan       12     Camella sinensia     Theaceae     Fipallocarechin gallate       13     Cuthuranthus     Apocynaccae     Vinblastine, Vincristine       14     Hedyotis diffusa     Oocystaceae     Izysine       11     Bentla utilis     Bentlaceae     Bentlin       12     Camellia sinensis     Theaceae     Epigallocarechin gallate       13     Cutharanthus     Apocynaceae     Vinblastine, Vincristine       14     Hedyotis diffusa     Oocystaceae     Lysine       15     Colchicum     Liliaceae     Colchicus demecolcine       16     Combretum     Combretaee     Combretastatin       17     Corcus sativus     Iridaceae     Safranal, Crocetin, Crocin       18     Echinacea     Asteraceae     Arabinogalactan       angustiolia     Asteraceae     Ginkgolia, Rutin       21     Giycyrthiza     Leguminosae     Giskeydide-B, A, C and J       22     Giycyrthiza     Leguminosae     Giycyrthizin       23     Gossylium     Malvaccae     Gossypol       barbachece     Iubri	8	Astragalus		Swainsonine
10     Aghila sylvestrv     Meliacae     Silvestrol       11     Betula utilis     Betulaceae     Betulan       12     Camelia sinensis     Theaceae     Epigallocatechin gallate       13     Catharanthus     Apocynaceae     Vinblastine, Vincristine       14     Hedyotis diffusa     Oocystaceae     Lysine       11     Betula utilis     Betulaceae     Berulin       12     Camelia sinensis     Theaceae     Epigallocatechin gallate       13     Catharanthus     Apocynaceae     Vinblastine, Vincristine       14     Hedyotis diffusa     Oocystaceae     Lysine       15     Colchicum     Lilaceae     Colchicines demecolcine       16     Combretum     Combretaeae     Salranal, Crocetin, Crocin       17     Corcus sativus     Iridaceae     Salranal, Crocetin, Crocin       18     Echinacea     Asteraceae     Ginkgoline, Rutin       argustifolia     resculentum,     exculentum,     Ginkgoline, Attaraeea       20     Ginkgo hiloba     Ginkoaceae     Ginkgoline, Attaraeea       21     Gycyrrhiza     Leguminosae     Ginke, Slue, Slue, Witamits (A, Bl, B2, Bl2, C, D, E and K)       22     Glycyrrhiza     Leguminosae     Ginke, Slue, Slue, Witamits (A, Bl, B2, Bl2, C, D, E and K)       22	9	Agapanthus	Agapanthaceae	Isoliquiritigenin
11       Berula utilis       Betulaceae       Betulin         12       Camelia sinensis       Theaceae       Epigallocatechin gallate         13       Catharanthus       Apocynaceae       Virblastine, Vincristine         14       Hedyotis diffusa       Oocystaceae       Epigallocatechin gallate         12       Camellia sinensis       Theaceae       Epigallocatechin gallate         13       Catharanthus       Apocynaceae       Virolastine, Vincristine         14       Hedyotis diffusa       Oocystaceae       Lysine         15       Colchicum       Lilaceae       Colehicines demecolcine         16       Combritaceae       Combritaceae       Conbritaceae         17       Corcus sativus       Iridaceae       Asteraceae         18       Echinacea       Asteraceae       Arabinogalactan         angustifolia       Asteraceae       Ginkgolide-B. A. C and J         21       Glycine max       Leguminosae       Zinc, selenium. Vitamins (A. B1, B2, B12, C. D. E and K)         22       Glycyrrhiza       Leguminosae       Zinc, selenium. Vitamins (A. B1, B2, B12, C. D. E and K)         23       Gossyptiun       Malvaceae       Gossyptol       Gossyptol         24       Gyrophora       Umbilicaria	10		Meliaceae	Silvesterol
12     Camedia sinensis     Theaceae     Epigallocatechin gallate       13     Catharamhus     Apocynaceae     Virolastine, Vincristine       14     Hedyotis diffusa     Oocystaceae     Lysine       11     Betula utilis     Betulaceae     Betulin       12     Camelia sinensis     Theaceae     Betulin       12     Camelia sinensis     Theaceae     Betulin       12     Camelia sinensis     Theaceae     Betulin       13     Catharamhus     Apocynaceae     Virolastine, Vincristine       15     Colchicum     Lilaceae     Colchicines demecolcine       16     Combretum     Combritaceae     Combretastatin       17     Corcus sativus     Iridaceae     Safranal, Crocetin, Crocin       18     Echinacea     Asteraceae     Arabinogalactan       angustifolia     Ginkoaceae     Ginkgolide-B, A, C and J       20     Giverpriza     Leguminosae     Giverpriza       21     Glycrypriza     Leguminosae     Giverpriza       22     Glycrypriza     Leguminosae     Gossypol       23     Gossypium     Malvaceae     Gossypol       24     Gyrophora     Umbilicariaceae     Polysaccharides β-glucans, α-glucans, e-glucans, e-glucans, e-glucans, e-glucans, e-glucans, e-glucans, e-glucans, e				
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roscus         Poscus           14         Hedyotis diffusa         Oocystaceae         Lysine           11         Betula utilis         Betulaceae         Betulin           12         Camellis sinensis         Theaceae         Bejgallocatechin gallate           13         Catharanthus         Apocynaceae         Vinblastine, Vincristine           14         Hedyotis diffusa         Oocystaceae         Lysine           15         Colchicum         Liliaceae         Colchicines demecolcine           Interum         Combritaceae         Safranal, Crocetin, Crocin           16         Combrutum         Combritaceae         Arabinogalactan           angustifolia         Asteraceae         Arabinogalactan           angustifolia         Ginkoaceae         Ginkygolide-B, A, C and J           21         Glycirniza         Leguminosae         Zinc, selenium, Vitamins (A, B1, B2, B12, C, D, E and K)           23         Gossyptium         Malvaceae         Folysaccharides β-glucans, α-glucans,           32         Gossyptium         Lapitaceae         Cynogheriz           33         Gossyptium         Iniaceae         Cynogheriz           34         Gyrophora         Umbilicariaceae         Colysocharides β-glucans, α-glucans,				
14     Hedyotis diffusa     Oocystaceae     Lysine       11     Betula utilis     Betulaceae     Betulin       12     Carnellia sinensis     Theaceae     Episallocatechin gallate       13     Catharanthus     Apocynaceae     Vinblastine, Vincristine       14     Hedyotis diffusa     Oocystaceae     Lysine       15     Colchicum     Lilaceae     Colchicines demecolcine       14     Indexeae     Colchicines demecolcine       16     Combretum     Combritaceae     Safranal, Crocetin, Crocin       17     Corcus sativus     Iridaceae     Safranal, Crocetin, Crocin       18     Echinacea     Astraceae     Arabingalactan       angustifolia     Astraceae     Zinc, Sclenium, Vitamins (A, B1, B2, B12, C, D, E and K)       20     Ginkgo bioba     Ginkoaceae     Giosypot       21     Glycyrrhiza     Leguminosae     Gosypot       22     Gossypium     Malvaceae     Gossypot       barbadense     Umbilicariaceae     Cynogenetic glycosides, Lignans       22     Lumus edodes     Agaricaceae     Lentinan       23     Gossypium     Labiateae     Monoterpene ketones       24     Gyophora     esculenta     Cynogenetic glycosides, Lignans       25     Lentinas Species </td <td>15</td> <td></td> <td>просупасеае</td> <td>vinorastine, vineristine</td>	15		просупасеае	vinorastine, vineristine
Image: Problem Stress         Deculation           11         Betula utilis         Betulaceae         Betulin           12         Camellia sinensis         Theaceae         Epigallocatechin gallate           13         Catharanthus         Apocynaceae         Vinblastine, Vincristine           14         Hedyotis diffusa         Oocystaceae         Lysine           15         Colchicum         Lilaceae         Colchicines demecolcine           14         Hedyotis diffusa         Oocystaceae         Combretastatin           16         Combretum         Combritaceae         Combretastatin           angustifolia         Asteraceae         Arabinogalactan           19         Fagopyrum         Polygonaceae         Ginkgolide-B, A, C and J           21         Gilycine max         Leguminosae         Zinc, selenium, Vitamins (A, B1, B2, B12, C, D, E and K)           22         Gilycyrthiza         Leguminosae         Gossypol           23         Gossypiun         Malvaceae         Gossypol           24         Gyrophora         Umbilicariaceae         Cynogenetic glycosides, Lignans           23         Lentinus edodes         Agaricaceae         Eltipticine ad9-nethoxy ellipticine           24         Lentinus edodes	14		Occustaceae	Lysine
12       Camellia sinensis       Theaceae       Epigallocatechin gallate         13       Catharanthus       Apocynaceae       Vinblastine, Vincristine         14       Hedyotis diffusa       Oocystaceae       Lysine         15       Colchicum       Liliaceae       Colchicines demecolcine         16       Combretum       Combritaceae       Combretastatin         caffrum       Corcus sativus       Iridaceae       Safranal, Crocetin, Crocin         17       Corcus sativus       Iridaceae       Asteracea         angustfolia       Asteracea       Arabinogalactan         angustfolia       Ginkgo biloba       Ginkoaceae       Ginkgolide-B, A, C and J         20       Ginkgo biloba       Ginkoaceae       Ginkgolide-B, A, C and J         21       Glycyrrhiza       Leguminosae       Zinc, selenium, Vitamins (A, B1, B2, B12, C, D, E and K)         22       Gossypium       Malvaceae       Polysaccharides β-glucans, σ-glucans,         23       Gossypium       Leguminosae       Polysaccharides β-glucans, σ-glucans,         24       Gyrophora       Umbilicariaceae       Colysaccharides β-glucans, σ-glucans,         23       Octrosia elliptica       Monoterpene ketones       Polysocharides         24       Dyropaca	14	ricuyous ullusa	obcystaccae	Lysinc
12       Camellia sinensis       Theaceae       Epigallocatechin gallate         13       Catharanthus       Apocynaceae       Vinblastine, Vincristine         14       Hedyotis diffusa       Oocystaceae       Lysine         15       Colchicum       Liliaceae       Colchicines demecolcine         16       Combretum       Combritaceae       Combretastatin         caffrum       Corcus sativus       Iridaceae       Safranal, Crocetin, Crocin         17       Corcus sativus       Iridaceae       Asteracea         angustfolia       Asteracea       Arabinogalactan         angustfolia       Ginkgo biloba       Ginkoaceae       Ginkgolide-B, A, C and J         20       Ginkgo biloba       Ginkoaceae       Ginkgolide-B, A, C and J         21       Glycyrrhiza       Leguminosae       Zinc, selenium, Vitamins (A, B1, B2, B12, C, D, E and K)         22       Gossypium       Malvaceae       Polysaccharides β-glucans, σ-glucans,         23       Gossypium       Leguminosae       Polysaccharides β-glucans, σ-glucans,         24       Gyrophora       Umbilicariaceae       Colysaccharides β-glucans, σ-glucans,         23       Octrosia elliptica       Monoterpene ketones       Polysocharides         24       Dyropaca	11	Retula utilia	Betulacene	Betulin
13       Catharanthus roscus       Apocynaceae       Vinblastine, Vincristine         14       Hedyotis diffusa       Oocystaceae       Lysine         15       Colchicum       Liliaceae       Colchicines demecolcine         16       Combretum       Combritaceae       Combretastatin         17       Corcus sativus       Iridaceae       Safranal, Crocetin, Crocin         18       Echinacea       Asteraceae       Arabinogalactan         angustifolia       Asteraceae       Arabinogalactan         19       Fagopyrum       Polygonaceae       Zinc, Selenium, Vitamins (A, B1, B2, B12, C, D, E and K)         20       Ginkgo biloba       Ginkoaceae       Zinc, Selenium, Vitamins (A, B1, B2, B12, C, D, E and K)         21       Glycyrrhiza       Leguminosae       Glycyrrhizin         23       Gossyptim       Malvaceae       Polysaccharides β-glucans, a-glucans,				
roscus       L. J.         14       Hedyotis diffusa       Oocystaceae       Lysine         15       Colchicum       Lilaceae       Colchicines demecolcine         16       Combretum       Combritaceae       Combretatian         17       Corcus sativus       Iridaceae       Safranal, Crocetin, Crocin         18       Echinaceaa       Asteraceae       Arabinogalactan         angustifolia       Asteraceae       Arabinogalactan         19       Fagopyrum       Polygonaceae       Amygdalin, Rutin         esculentum,       Cinkoaceae       Ginkgolide-B, A, C and J         21       Glycyrrhiza       Leguminosae       Zinc, selenium, Vitamins (A, B1, B2, B12, C, D, E and K)         23       Gossyplium       Malvaceae       Gossypol         barbadense       Umbilicariaceae       Polysaccharides β-glucans, α-glucans, e-glucans, e-				
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35     Colchicum autumnale     Liliaceae     Colchicine       36     Betula alba      Betulinic Acid				
autumnale     36       Betula alba        Betulinic Acid	35		Liliaceae	Colchicine
36     Betula alba      Betulinic Acid				
	36			Betulinic Acid
37   Camptotheca   Cornaceae   Camptothecia, Topotecan, CPT-11, 9-Aminocamptothecin				
	37	Camptotheca	Cornaceae	Camptothecia, Topotecan, CPT-11, 9-Aminocamptothecin

# table 1: plants used in cancer treatment[ 9-35]

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<b>a</b> :	acuminate		
38	Taxus baccata	Taxaceae	Docetaxel, Taxol
39	Cannabis sativa		
40	Tabebuia	Cannabaceae	Beta-Lapachone, Lapachol
	impetiginosa,		
	T. avellanedae		
41	Podophyllum	Berberidaceae	Podophyllotoxin, Etoposide, Podophyllinic Acid, and Teniposide
	peltatum		
42	Nothapodytes	Icacinaceae	Acetylcamptothecin,
	foetida		
43	Heracleum	Apiaceae	-
	persicum	1	
44	Gmelina asiatica	Verbenaceae	-
45	Adiantum	Adiantaceae	
10	venusutum	Turuntuoouo	
46	Anemopsis	Saururaceae	cymene, limonene, piperitone and thymol
40	californica	Saururaceae	cymene, mnonene, pipertone and mymor
47		A 1	
47	Alangium	Alangiaceae	quercitin, kaemferol
	salviifolium		
49	Aspidosperma	Apocynaceae	-
	tomentosum		
50	Antiaris Africana	Moraceae	betulinic acid, 3β-acetoxy-1β,11α-dihydroxy-olean-12-ene, ursolic acid, oleanoli
			acid, strophanthidol, periplogenin,
51	Amoora rohituka	Meliaceae	
52	Aegle marmelos	Rutaceae	Butylp-tolyl sulfide, 6-methyl-4-chromanone and 5-methoxypsoralen
53	Hibiscus	Malvaceae	
	mutabilis		
54	Arnebia nobilis	Boraginaceae	Arnebin
55	Aesculus	Sapindaceae	β-escin
55		Sapinuaceae	p-escii
	hippocastanum	0 11	
56	Biophytum	Oxalidaceae	Amentoflavone, Isoorientin, Orientin, vitexin, epicatechin, 1, 2 dimethoxy benzene
	sensitivum		linalool oxide, linalyl,
			acetate, isophorone
57	Cuscuta reflexa	Convolvulaceae	Kaempferol, uercitin, hydroxycinnamic acid, scoparone, melanettin, quercetin
			hyperoside, cuscutalin, iso-rhamnetin-3-0-neohesperidoside, apigenin-7-0
			rutinoside, lycopene, amarbelin
58	Caesalpinia	Caesalpiniaceae	Bonducin, Caesanol1, 6ß, 7ß dibenoyloxyvoiacapen-5-a-ol, Bonducellpins A, B, C
	bonducella		D
59	Cassia fistula,	Fabaceae	Anthraqquinone, fistullic acid, rhein glucoside, phlobaphenes, emodin
	Cassia tora,		chrysophanic acid, fistuacacidin, hexacosanol, obtusin, chryso-obtusin, obtusifolin
	Cassia absus ,		ononitol monohydrate, rubrofusarine, rubrofusarine triglucoside, non rubrofusarine
	Cassia auriculata		gentiobioside ,panwar gum, chaksine, isochaksine, hydnocarpin, apigenin
	Cussia auriculata		raffinose, di-(2-ethyl) hexyl phthalate, sennoside A,B,C,D, palmidin A, rhein, aleo
	, Cassia senna		emodin, myricyl alcohol, salicylic acid, barbaloin
60		Capparidaceae	
60	Cleome gynandra	Cappanuaceae	Centaureidin, myricitin, taraxasterol, capric acid, lauric acid, glucocapparin
			hexacosanol, viscosic acid, viscosin, glucoiberine, neoglucobrassicin
<i></i>		. ·	glucobrassicin
61	Centella asiatica	Apiaceae	Asiatic acid, madecassic acid, asiaticoside, asiatoside, madicassoside
			brahminoside, brahmoside, centelloside
62	Cola nitida	Malvaceae	1,3,7-trimethyl-1H-purine-2,6(3H,7H)-dione, n-Hexadecanoic acid
63	Cirsium	Asteraceae	Cireneol G, ciryneol H, ciryneol C, p-coumaric acid, syringing, linarin, ciryneon
	japonicum		F, ciryneol A
64	Citrus medica	Rutaceae	Methyl ferulic acid, dihydro-N-caffeoyltyramine, acacetin, ß-ecdysterone, (-)
			balanophonin, p-methoxy cinammic acid, umbelliferone, ferulic acid, diosmetin,
			4-methoxy salicylic acid
65	Cissus	Vitaceae	Iridoids, stilbenes
	quadrangularis		
66	Clerodendrum	Verbanaceae	Hispidulin, cleroflavone, apigenin, scutellarein, serratagenic, acteoside
00		* croanaccat	verbascoside, clerodermic acid, clerodolone, clerodone, clerosterol
	serratum,		
	Clerodendrum		
<i>(</i> =	viscosum		
67	Crinum asiaticum	Amaryllidaceae	Criasiaticidine A, lycorine, pratorimine, crinamine, hippadine, hamayane
			plaforinine, norgalanthamine, epinorgalanthamine
68	Daucus carota	Apiaceae	Carotene, carotin
_	Embelia ribes	Myrsinaceae	Embelin, christembine
69	Linocha nocs		
69 70	Jatropha curcas	Euphorbiaceae	5a-stigmastane-3,6-dione, nobiletin, B-sitosterol, taraxerol, jatropholone

71	Kaempferia galangal, Kaempferia rotunda	Zingiberaceae	Et-p-MeO-trans-cinnamate, crotepoxide
72	Lanata camara	Verbanaceae	Valecene, isocarypohyllene, bicyclogermacrene, germacrene D
73	Lens culinaris medikus	Fabaceae	-
74	Limonia acidissima	Rutaceae	Bergapten, orientin, vitedin, marmin, feronolide, feronone, feronialactone, geranyl umbelliferone, marmesin, ursolic, flavanone glycoside-7-O-methylporiol-4'-ß- xylopyranosyl-D-glucopyranoside
75	Macrotyloma uniflorum	Fabaceae	Psoralidin, agglutinin, pyroglutamylglutamine
76	Mimosa pudica	Mimosaceae	Mimosine, 2-mercaptoaniline
77	Nicotiana tabacum	Solanaceae	Rutin, chlorogenic acid, glutamic acid, anabasine, myosmine, cotinine, tabacinine, tabacine, anthalin, nicotelline, nicotianine
78	Rhinacanthus nasuta	Acanthaceae	Rhinacanthin, rhinacanthin-C, rhinacanthin-D.
79	Zanthoxylum armatum	Rutaceae	a-amyrin, armatonaphthyl arabinoside, 1-linoleo-2,3-diolein
80	Xanthium strumarium	Compositae	Spathulenol, a-cadinol, a-muurolene, copaene
81	Salvadora persica	Salvadoraceae	Salvadoricine, salvaoside, salvadoraside, manisic acid, salvadourea [1,3-bis(3-methoxy-benzyl)-urea]
82	Symplocus cochinchinensis	Symplocaceae	Phloretin-2-glucoside
83	Vernonia cinerea	Asteraceae	Luteolin-7mono-beta-D-glucopyranoside, lupeol acetate
84	Vitex trifolia	Verbanaceae	Artemetin, 7-desmethyl emetin, sabinene, a-pinene, caryophyllene, vitricin
85	Solanum nigrum	Solanaceae	Diosgenin
86	Tinospora cardifolia	Menispermaceae	COlumbin, tinosporaside, jatrorhizine, tembeterine, tinocordifolioside, tinosporic acid, tinosporal, tinosporon
87	Momordica dioica	Cucurbitaceae	Momordicin, momodicaursenol, gypsogenin
88	Cynodon dactylon	Poaceae	Ortho hydroxyphenyl acetic acid, syringic acxid, para coumaric acid
89	Drosera indica	Droseraceae	Rossol <mark>iside, hyper</mark> oside
90	Barleria grandiflora	Acanthacae	Iridoids, acetylbarlerin, scutellarein-7-rhamnosyl.
91	Terminalia chebula	Combretaceae	Arjunglucoside I, arjungenin, chebulosides I and II, chebulin, 2,4-chebulyl-ß-D- glucopyranose, chebulinic acid, chebulic acid, terchebin
92	Cucurbita maxima	Cucurbitaceae	Cucurbitacin, cucurbitin, pheophytin A, niacin, thiamine

## MEDICINAL PLANTS WITH ANTICANCER ACTIVITY

#### Allium Sativum (Allicin):

Allium sativum (Garlic, Lasun) is used to treat a wide variety of diseases in India. Allicin is a major component of raw garlic and ajoene is a product of the rearrangement of allicin. Its cytotoxic effect has been tested using human primary fibroblasts, a permanent, nontumorgenic cell line derived from baby hamster kidney cells and a tumorgenic lymphoid cell line derived from a Burkitt lymphoma. The cytotoxic action was in the range 2-50  $\mu$ g/ml.Some organo-sulfur compounds from garlic, like S-allylcysteine, are reported to retard the growth of chemically induced and transplantable tumors in several animal models.[36] Administration of garlic (250 mg/kg, p.o., thrice a week) in male wistar rats, has been significantly suppressed 4-nitro quinoline-1-oxide induced tongue carcinogenesis as revealed by the absence by the carcinomas in the initiation phase and their reduced incidence in the post initiation phase.[37]

Actinidia chinensis: Actinidia chinensis root are used by the Chinese physicians in the treatment of cancer. Actinidia chinensis contains a polysaccharide known as "ACPSR" that possesses immune-enhancing and anticancer activities [38].

Aegle marmelos: Lupeol, isolated from Aegle marmelos, possesses strong anticancer activity against breast cancer, malignant lymphoma, malignant melanoma, malignant ascites and leukaemia. Aegle marmelos possesses significant antioxidant activity and reduces side effects of chemotherapy and radiotherapy [39].

Agave americana: The ethanolic extract of A. americana leaves has a cytotoxic and antitumor activity. Leaf contains steroidal saponin, alkaloid, coumarin, isoflavonoid, hecogenin and Vitamins (A, B, C). Therefore, this plant has potential to be utilized for the development of novel anticancer drug leads [40].

Aloe vera: Aloe vera contains aloe-emodin, which activates the macrophages to fight cancer. Aloe vera also contains acemannan, which enhances activity of the immune cells against cancer [41]. Aloe vera is found to inhibit metastases [42].

#### Bacopa Monnieri

It belongs to the Scrophulariaceae family and found throughout the plains in India. It is reported to contain tetracyclic triterpenoid saponins, bacosides A and B, herpestine,

brahmine, flavonoids, stigmasterol [43]. Stigmasterol is known to possess anticancer activity by inducing apoptosis mediated by the activation of protein phosphatase 2A by ceramide. Study conducted by Ghosh [44] evaluated the antitumor activity of stigmasterol isolated from Bacopa Monnieri on Ehrlich Ascites Carcinoma in swiss albino mice and found that stigmasterol enhanced the life span of tumor bearing mice by decreasing the tumor volume and viable cell count.

#### **Bidens Pilosa**

It belongs to the Asteraceae family and native to the America. It contains polyacetylenes, flavonoids, phenylpropanoids terpenoids, and others compounds. Phenyl-1, 3, 5-heptatriyn

possesses toxicity profile on normal blood cells in erythrocyte osmotic fragility experiments along with other extracts [45]. Hexane, methanol and chloroform extracts of Bidens pilosa and their fractions were tested on various cancer cell lines. Results showed the antitumor activity of extracts among which hexane extract showed maximum activity [46].

#### Catharanthus roseus

It belongs to the Apocynaceae family and commonly known as rosyperiwinkle or Madagascar periwinkle. Its main compound is alkaloids, and used for the circulatory diseases treatment and provide relief to the normal cerebral blood flow obstruction. Vinblastin and vincristine are the two well-known compounds which significantly effects against the human neoplasm. Vincristin sulfate arrest mitosis and utilized for the treatment of acute leukemia in children and vinblastin sulfate is utilized for the treatment of choriocarcinoma, lymphosarcoma, neuroblastoma and carcinoma of lung, breast and other organs [47].

#### Centella asiatica

It belongs to the Apiaceae family and commonly known as brahmamanduki in Hindi, mandukaparni in Sanskrit and pennywort in English. It is commonly found in India, Australia, Pacific Islands, New Guinea, Iran and Malaysia. It contains numerous compounds such as asiaticoside, pectic acid, hydrocotyline, sterol, flavonoid, vallerine, ascorbic acid and

thankunosides [48]. Partially purified fraction of Centella asiatica suppressed mouse lung fibroblast cell proliferation and oral administration slowed the solid development and ascites

tumours [49]. Pre-treatment with this plant increase the survival time of irradiated animals and show protection against radiation induces damage in liver [50].

**Conclusion:** In this review an attempt to describe the anticancer activity of various medicinal plants such as **Allium Sativum** (**Allicin**):, Solanum nigrum ,Tinospora cardifolia ,Momordica dioica, Crinum asiaticum ,Cynodon dactylon ,Daucus carota,Jatropha curcas,,Embelia ribes ,Centella asiatica ,Cola nitida ,Cirsium japonicum, , Cissus quadrangularise, etc are included in this article .

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