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USEFUL MEDICINAL PLANTS HAVING ANTI-CANCEROUS AND ANTI-TUMOROUS MEDICINAL POTENTIAL OF *WITHANIA SOMNIFERA (L.)* DUNAL, *ANDROGRAPHIS PANICULATA* (BURM.F.) WALL AND *GLYCYRRHIZA GLABRA* L.

Pawan Kumar Sagar *, Asma Sattar Khan and Suryansh Kashyap

Drug Standardization Research Institute, CCRUM, Ministry of AYUSH), PCIM & H, Campus, Kamla Nehru Nagar, Ghaziabad - 201002, Uttar Pradesh, India.

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Correspondence to Author:
Dr. Pawan Kumar Sagar

Research Officer (Chemistry), Scientiest-3 Level, Room No.-333, Drug Standardization Research Institute, CCRUM, Ministry of AYUSH), PCIM & H, Campus, Kamla Nehru Nagar, Ghaziabad - 201002, Uttar Pradesh, India.

E-mail: pawansagarkr93@gmail.com

ABSTRACT: A study has reviewed three medicinal plants from India that have been traditionally used for treating and preventing diseases, including cancer. These plants, namely *Withania somnifera* (L.) Dunal, *Andrographis paniculata* (Burm.f.) Wall, and *Glycyrrhiza glabra* L., possess anti-cancer and anti-tumorous properties. They contain various bio-active constituents and secondary metabolites, such as Withanolides, Withaferins-A, D, Withanone, Withanosides, steroidal lactones, Adriamycin, and 5-fluorouracil in *Withania somnifera* (L.) Dunal. *Andrographis paniculata* (Burm.f.) Wall contains Andrographolide, β-Sitosterol, Stigma Sterol, Chlorophylla, 5-2-dihydroxy-7,8-dimethoxy-flavone, β-Sitosteryl fatty acid ester, lupeol, and Triacylglycerols. *Glycyrrhiza glabra* (L.) contains Glycyrrhezic acid, 18β-Glycyrrhetic acid, Glycyrrhizin, Anethole,(3% to total volatile), Iso-flavone Glabreneonl, Iso-flavone glaberidin, Licochalcone-A, and licoagrochalcone. These plants have shown promising results in preventing and inhibiting the growth of cancer cells and tumours in both in-vitro and in-vivo studies. The study highlights the ethnobotanical, pharmacological, and biological activities of these plants and emphasizes their potential for novel drug discovery, pharmacopoeial standardization, and clinical research.

INTRODUCTION: The burden of cancer rose to 18.1 million new cases and 9.6 million deaths in 2018. With 36 different types, Cancer mainly affects men in the form of colorectal, liver, lung, prostate, and stomach whereas in women in the form of breast, cervix, colorectal, lung, and thyroid [6].

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In the present lifestyle scenario of human being, Cancer is a one of the very harmful diseases which are characterized by irregular cell proliferation. High mortality and incidence make it an important public health and economic issue which requires an effective prevention.

Medicinal plants have various advantages over chemical products because plants derived from bio active compounds are more tolerant and non-toxic to normal human cells. Already available conventional therapies for the treatment of cancer are radiotherapy and chemotherapy which have various toxicities, seriously affecting the health of the person. Therefore, an alternative method is

required to develop which is less toxic and more potent anticancer drug as compared to the drugs available in the market. Recently there has been an increased scientific interest in the study of material from plant sources as an anticancer compound. Several studies have found the role of medicinal plants in prevention and treatment of cancer [21]. The most common reason behind cancer is lifestyle changes and there is urgent need to find a better treatment for the disease which is required. According to World Health Organization, more than 14 million people diagnosed with cancer and 9 million died in 2013. (www.who.in) (Ray *et al*., 2017 and WHO. 2017) [12], the cancer- causing agents (carcinogens) can be present in food and water, in the air, and in chemical and radiation due to sunlight that people are exposed to. Since, epithelial cells cover the skin, line the respiratory and alimentary tracts, and metabolize ingested carcinogens, it is not surprising that over 90% of cancer occur in epithelia.

More significantly a globalization of unhealthy lifestyles, particularly cigarette smoking, Tobacco usage and the adoption of many features of the modern Western diet (high fat, low fibers content etc.) will increase cancer incidence [27-31, 68-69]. Plant are an important source of synthetic and herbal agents used in several pharmaceutical industries. Some of the prominent plant derived compound have a major role in the development of several clinically useful anticancer agents such as Vinblastine, Vincristine, teniposide and etoposide derivative, topotecan, paclitaxel (Taxol) etc. (Singh *et al.,* 2013) [26]. Taxol and Camptothecin were among the most important anti-cancer compound derived from plants available today [33].

Several synthetic or natural chemo-preventive agents are used worldwide to cure the disease. Chemically synthesized agents have their toxicity and DNA damage induction potential which prevents their uses. (Bisht *et al.,* 2011; [26] Sasaki *et al.,* 2002) [58]. Because the genuine region of the serious side effects of synthetic chemo-preventive agents, the research is going on to investigate the plant derived chemotherapeutic agents without toxicity. Bio-prospective for plants important with anti-cancer activity has been a major focus in the search for plant based cures [31-59]. Anti-neoplasm (anti-cancerous) activity is defined as effect of natural, synthetic or biological chemical agents used to reverse, suppress or prevent carcinogenic progression [41]. Himalayan plants grown in high altitude are the rich source of various secondary metabolites such as anthraquinones, flavonoids, tannins, alkaloids as well as medicinal plants contain wide range of secondary metabolites which include flavonoids, flavones, anthocyanins, lignans, coumarins, isocatechins and catechins *etc*. [8, 26], Sumer J. 2000) India has a rich history of using plants for health care in general (Misra *et al*., 2008) 44and treatment of cancer in particular without causing toxicity [41]. Cancer has become an important Public Health Problem with over 900,000 new cases occurring every year and is one of the ten leading causes of death in India [37-46].

Plants contain many active compounds such as alkaloids, steroids, tannins, glycosides, volatile oils, fixed oils, resins, phenols and flavonoids etc. which are deposited in their specific parts such as Whole, stems, leaves, flowers, bark, seeds, fruits, roots, etc. The beneficial medicinal effects of plant materials typically result from the combination of these secondary products [36] Tonthubthim thong *et al*., 2001). National Cancer Institute has approximately screened 35,000 plant species for their potential anticancer activities and they have found that among them about 3,000 plant species have shown reproducible anticancer activity [64]. In 1985 Farnsworth *et al*. identified 119 secondary plant metabolites which were used as drugs.

Out of 255 drugs which are considered as basic and essential by the World Health Organization (WHO), 11% are obtained from plants and a number of synthetic drugs are also obtained from natural precursors. Herbal plants based extract medicines are used worldwide in Asian, European, Chinese, Japan, Korea, Malaysian, Canadian countries for cure of human being since ancient time and has Provided human being a miraculous powerful spirit to fight again several harmful diseases which have medicinal potential and are highly safe and efficacious higher yielding, standard quality formulated products without showing any adverse and side effect. For thousands of years mankind is usage plant source to alleviate or cure illnesses. Plants constitute a source of novel chemical compounds which are of potential use in

medicine and other applications [28] Sagar *et al*., 2020 and 2021).

Methods: The sources of scientific literature were accessed from various electronic databases such as PubMed, Google Scholar, Science Direct, and library search, studies drugs samples authonicated and confiremed of these botanical, scientific indentification by our Experts botanist, pharmacognosist, Scientist and Researchers of Council research Institutes as NMPB, New Delhi, NRIUSD, Hyderabad, T.S., India & RRIUM, Chennai, T.N., India as well as DSRI, Ghaziabad, U.P., India - SMPU and DSRU. Units under Ministry of AYUSH., Govt. of India and INMAS, (DRDO.), under Ministry of Defence, New Delhi, Govt. of India Organizations associated with Librarial harmony.

Asgand/Ashwagandha (*Withania somnifera* (L.) Dunal): Ashwagandha has been prized top notch adaptogenic tonics in India for 3000-4000 years. The plants contain the alkaloids withanine and somniferine, which are used to treat nervous disorders, intestinal infections and leprosy**.** All plant parts are used including the roots, bark, leaves, fruit and seed**.**

Language		Common Names
Gujarati	:	Asam, Asoda, Ghodasoda
Hindi	:	Asgandh
Canarese	:	Amangura, Hirimaddina-gadde, Sogada-bery
Marathi	:	Asgundh, Kanchuki, Askandha
Sanskrit	:	Ashvagandha, Balada, Gandhpatri, Kamrupini, Vajini
Bengali	:	Ashvagandh
Punjabi	:	Asgand
Tamil	:	Asuragandi
Telugu	:	Asvagandhi, Penneru
Urdu	:	Asgand, Asgandanagaori

Habitat**:** It is native to arid parts of India. It is a perennial herb that reaches about to 6 ft in nature**.** A shrubby, semi-woody, perennial herb to 1½ m hight to grassland and waste places; recorded only in Mali, Liberia and North Nigeria in the Region, but occurring more commonly across central Africa, East, North East, South central and southern Africa, and into India and South East Africa, in southern Africa the flowering time is mostly from October to June, while the fruiting time is mostly from October to July**.**

Description: It is a short, tender perennial herb growing 35-75 cm height**.** Velvet-hairy branches extend radially from a central stem**.** Leaves are dull green, elliptic, usually up to 10-12 cm long**.** The flowers are small, green and bell-shaped. Orange fruits in persistent papery sepals follow the small greenish flowers. The leaves are alternate**(**opposite on flowering shoots), simple, margins entire to slightly wavy, broadly ovate, obovate or oblong, 30-80 mm long and 20-50 mm broad having, 5-20 mm long petioles, 5-8 mm across, orange-red to red when ripe and enclosed by the enlarged calyx**.** Fruit containt numerous seeds pale brown, 2**.**5 mm across, ± kidney-shaped and compressed with a rough, netted surface**.**

FIG. 1: *WITHANIA SOMNIFERA* (L.) DUNAL A. FRESH WHOLE PLANT, B. FRESH LEAVES WITH FRUITS PART, C. FRESH FRUITS PART, D. DRIED ROOTS PART

In *Withania somnifera* reported and present Withanolides and Withaferins-A, D along with a few other metabolites including Withanone and Withanosides, Steroidal lactones, Adriamycin and 5-fluorouracil etc. active phytochemical constituents marker compounds as well as these showen and confiremed Anti-Cancers **(**Human Cervical cancer, Human breast, CNS, lung, and Colon Skin, Cervix, prostate, Cancers**),** Anti-Tumor, **(**Skin, Brain Tumor**)**, Anti-Carcinogenic, *in-vitro*, *in-vivo* various cells lines, Animal clinical

trail studies**. (**detail showen in **Fig. 1: A, B, C, D** and **Table 1, 2** & **3**, Sr**.** N0**.**-1**)**

Kalmegh, Kalamegha / Kirayat (*Andrographis paniculate* (Burm.f.) Wall): An Ayurveda herb is also known as Kalmegh or Kalamegha, meaning "dark cloud", it is also known as Bhui-nee, meaning "neem of the ground".

Language		Common Names
Assamese	:	Chiorta
Marathi	:	Olikiryata
Bengali	:	Kālmegh
Oriya	:	Bhuinimba
English	:	King of bitters, andrographis
Persian	:	Naine-havandi
Gujarati	:	Kariyatu
Sanskrit	:	Kālamegha, Bhūnimba
Hindi	:	Kirayat
Tamil	:	Nilavembu, Sirunangai, Siriyanangai
Malayalam	:	Nilavembu, Kiriyattu

The therapeutic value of Kalmegh is due to its mechanism of action which is perhaps by enzyme induction. The plant extracts exhibit antityphoid and antifungal activities. Kalmegh is also reported to possess antihepatotoxic, antibiotic, antimalarial, antihepatitic, antithrombogenic, anti-inflammatory. Other activities as liver protection under various experimental conditions of treatment with galactosamine, paracetamol *etc*. are also attributed to andrographolide. Andrographolide has shown inhibition of *in-vitro* proliferation of different tumour cell lines, representing various types of cancers.

Habitat: The plant is native to southern, west, northeast region of India and Sri Lanka, and is found in China, Thailand, India, and Pakistan and is also introduced and cultivated in the East and West Indies. It is found in a variety of habitats, such as plains, hillsides, and coastlines. It is also found in disturbed and cultivated areas such as roadsides, farms, and wastelands.

Description: The plant is erect grow to the height of 30-110 cm (12-43 in) in moist, shady places. The slender stem is dark green, squared in cross-section with longitudinal furrows and wings along the angles. The lance-shaped leaves have hairless blades measuring up to 8 cm(3.1 in) long by 2.5 cm (0.98 in).The small flowers are borne in spreading racemes. The fruit is a capsule around 2.0 cm (0.79 in) long and a few millimetres wide. It contains many yellow-brown seeds. In Andrographis paniculatereported and present Andrographolide, β-Sitosterol, Stigma Sterol, Chlorophylla, 5-2-dihydroxy-7, 8-dimethoxy-flavone, β-Sitosteryl fatty acid ester, lupeol, Triacylglycerols etc. active phytochemical constituents marker compounds as well as these showen and confiremed Anti-Cancers (Human Breast, Prostate, lung, liver and Colon Skin, Cancers) Anti-Tumor,(Skin, colon, liver Tumor), Anti-Carcinogenic *in-vitro, in-vivo* various cells lines, Animal clinical trail studies.(detail showen in **Fig. 2: A, B, C, D** and **Table 1, 2** & **3**, Sr.N0.-8).

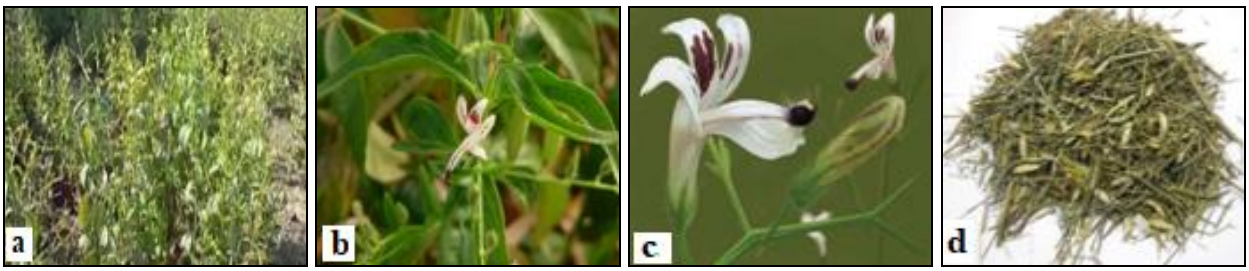

FIG. 2: *ANDROGRAPHIS PANICULATE* (BURM. F.) WALL, A. WHOLE PLANT, B.- FRESH STEMS, LEAVES WITH FLOWER, C.- FRESH FLOWER PART, D.- DRIED STEMS, LEAVES, FLOWERS PART

Mulathi/Jethimadhand Asl-us-soos (*Glycyrrhiza glabra* L.): Glycyrrhiza is a genus of about 20 accepted species in the legume family (Fabaceae), with a subcosmopolitan distribution in Asia, Australia, Europe, and the Americas. The genus is best known for liquorice (British English; licorice in American English**)**, *G.glabra*, a specie native to Eurasia and North Africa, from which most confectionery liquorice is produced**.**

Language		Common Names
Tamil	:	**N**uncu, vatalam, vellaikkunri, venkunri, vitakam, yastimatukam

Kannada	:	Jesthamadhu, yashtimaduka
Malayalam	:	Malayalam
Sanskrit	:	Jalayashti, klitaka, madhu
Urdu	:	Asl-us-soos, asal-ul-sus muqqashar, asal-us-sus nim kofta
Persian	:	Beikh-e-mahak, bikhe-mahak, bikhemahak, mahak, mazhn
Gujarati	:	Kariyatu
Sanskrit	:	Kālamegha, Bhūnimba
Hindi	:	Jethi-madh, jethimadh
Tamil	:	Yashtimadhukam
Marathi	:	Jashtimadh, jeshtamadha
English	:	Licorice, liquorice
Tibetan	:	Sin mnar

Habitat: The licorice root is native to Southeastern Europe and cultivated in most of Europe**.** It prefers the open, dry areas with rich soil. It was first harvested from the wild until it was cultivated one thousand years ago**.**

Description: The olant is a perennial herb, growing to1m in height, with pinnate leaves about 7-15cm (2.8-5.9 in) long, with 9-17 leaflets. The flowers are 0.8-1.2 cm (103-102 in) long, purple to pale whitish blue, produced in a loose inflorescence. The fruit is an oblong pod, 2-3 cm (3.4-11.6 in) long, containing several seeds. The roots are stoloniferous. In *Glycyrrhiza glabra* reported and present Glycyrrhezic acid, 18 β-Glycyrrhetic acid, Glycyrrhizin, Anethole **(**3%to total volatile**)**, Iso-flavone Glabreneonl, Iso-flavone glaberidin, Licochalcone-A, licoagrochalcone etc. are active phytochemical constituents marker compounds have shown and confirmed Anti-Cancers **(**Human Breast, Prostate, and Colon ,Skin**,** lung, Stomach and Kidney cancer Cancers**)** Anti-Tumor, **(**Breast, Skin, Colon, Tumor**)**, Anti-Carcinogenic activities Confirmed by *in-vitro*, *in-vivo* various cells lines, Animal clinical trail studies. **(**detail showen in **Fig. 3: A, B, C, D** and **Table 1, 2** & **3**, Sr**.**N0**.**-9).

FIG. 3: *GLYCYRRHIZA GLABRA* L., A. WHOLE PLANT, B. FRESH LEAVES WITH STEMS, C. FRESH FLOWER PART, D. DRIED STEM PART

TABLE 1: BOTANICAL /SCIENTIFIC AND LOCAL/ASU NAME OF STUDY PLANTS

Sr. no.	Botanical and Scientific Name	Local or ASU. Name	Reported References
01	*Withania somnifera* (L.) Dunal	Asgand or Ashwagandha	Shakya, 2016; Singh *et al*.,2013; Umadevi *et al*.,2012; Bisht *et al*.,2011; Singh(b) *et al*.,2010; Oza *et al*.,2010; Mathur *et al*.,2006; Padmavathi *et al*.,2005
02	*Andrographis Paniculate* (Burm.f.) Wall	Kalmegh/ Kalamegha/Kirayat	Singh *et al*., 2013; Bisht *et al*., 2011; Misra *et al*., 2008; Kumar *et al*., 2004; Rajagopal *et al*., 2003
03	*Glycyrrhiza glabra* (L.)	Mulathi/ Jethimadhand Asl-us-soos	Ayeka *et al*., 2016; Pandian and Chidambram,2016; Miraj, 2016; Kainsa *et al*.,2012; Hong *et al*.,2009; Hadidy *et al*.,2008

TABLE 2: MEDICINAL AND THERAPEUTIC POTENTIAL, USES OF STUDIED MEDICINAL PLANTS

Sr. no.	Name of Medicinal plant	Part used	Active phytochemical constituents	Medicinal, therapeutic potential and uses
01	*Withania somnifera* (L.) Dunal	Roots	Withanolides and Withaferins-A, D along with a few other metabolites including Withanone and Withanosides, Steroidal lactones, Adriamycin and 5-fluorouracil,	*In-vitro* cell lines and *In-vivo* and pharmacological reported confirmation, Anti-Cancers (Human Cervical cancer, Human breast, CNS, lung, and Colon Skin, Cervix, prostate, Cancers), Anti-Tumor, (Skin, Brain Tumor), Anti-Carcinogenic
	Andrographis	Arieal or	Andrographolide, β-Sitosterol,	*In-vitro* cell lines and *In-vivo* and

02	*Paniculate* (Burm.f.) Wall	Leaves	Stigma Sterol, Chlorophylla, 5-2-dihydroxy-7,8-dimethoxy-flavone, β-Sitosteryl fatty acid ester, lupeol, Triacylglycerols	pharmacological reported confirmation ,Anti-Cancers (Human Breast, Prostate, lung, liver and Colon Skin, Cancers) Anti-Tumor, (Skin, colon, liver Tumor), Anti-Carcinogenic
03	*Glycyrrhiza glabra* (L.)	Stems& Root	Glycyrrhezic acid, 18β-Glycyrrhetic acid, Glycyrrhizin, Anethole (3%to total volatile), Iso- flavone Glabreneonl, Iso-flavone glaberidin, Licochalcone-A, licoagrochalcone	*In-vitro* cell lines and *In-vivo* and pharmacological reported confirmation Anti-Cancers (Human Breast, Prostate, and Colon ,Skin, lung, Stomach and Kidney cancer Cancers) Anti-Tumor, (breast, skin, colon, Tumor), Anti-Carcinogenic

TABLE 3: *IN-VIVO* AND *IN-VITRO* ANTICANCER AND ANTI TUMOR STUDIES SELECTIVE MEDICINAL PLANTS

Plant Part	Subject of Study	Effect	Reference
***Withania somnifera* (L.) Dunal**			
Root extract of plant, Withaferin-A (Withanoide) isolated from the root	Nasopharynx, Sarcoma 180, Sarcoma Black, E0771 memory adeno, Carcinomas tumor cells	Prevention, Control and reduced significant tumor growth activity in Carcinomas	Prakash *et al*., 2013; Devi *et al*., 1996; Ali *et al*., 1997;Chakarbarti *et al*.,1974.
Aqueous root extract of plant	Exposed skin cancer causing agent 7,12-dimethyl benz (a) anthracene an induced skin cancer in mice	Prevention, Control and reduced growth of skin cancer cells, compared with standard group	Prakash *et al*., 2013; Prakash *et al*.,2002.
Root extract of plant, Withaferin-A **(**Withanoide) isolated from the root	Carcinomas cancer cells	Prevention and reduced the growth of human breast, CNS, lung, and colon cancer cells	Prakash *et al*., 2013; Jaya *et al*., 2003.
Aqueous root extract of plant	Urethane induced lung adenomas in adult male albino mice tumor cells	Prevention and control of growth of lung tumor cells in mice animals, compared with control standard groups	Prakash *et al*., 2013; Singh *et al*., 1986.
Aqueous root extract of plant	Carcinogens cancer cells in mice	Prevention and control of growth of cancer cells in treated mice animals	Prakash *et al*., 2013; Gupta *et al*., 2001.
Root extract of plant, Withanolides and Withaferins along with a few other metabolites including Withanone and Withanosides isolated from the root	Carcinogens cancer cells and induced of various type of cancer in mice	Prevention and control of growth of carcinogens cancer cells and various cancers in treated mice animals, compared with control standard groups	Rai *et al*., 2016.
Aqueous root extract of plant	Carcinomas tumor cells	Prevention, Control and reduced tumor size growth in Carcinomas induced tumor cells	Bisht *et al*., 2011; Singh *et al*., 2010(b).
Aqueous root extract of plant, Withaferin-A, Withanolide-Dfound in WS root extract	Urethane induced lung tumors in adult male mice	Prevention, inhibited and reduction growth of cancer in mice, compared with control standard groups	Bisht *et al*., 2011; Mathur*et al*., 2006.
Aqueous root extract of plant	Exposed stomach tumor causing agent benzo (a) pyrene an induced fore stomach papillogenesis tumor in mice	Prevention, Inhibited and reduced incidence and multiplicity growth of tumor cells, compared with standard group	Bisht *et al*., 2011; Wattenberg *et al*., 1980.
***Andrographis paniculate* (Burm.f.) Wall**			
Methanolic *Andrographolide* arial part extracts of plant herb	Cancer cell lines sw 620 and a498 on Swiss Albino mice	Prevention, reduction and inhibited of growth of Cancer cells	Tariq *et al*., 2022; Kumar *et al*., 2004

Ethanol Andrographolide arial part extracts of plant herb	HE-p2, (Human Larynx Carcinoma cells)Cancer cells, Applied MTT assay	Prevention, reduction and inhibited of growth of Cancer cells	Padmalochana *et al*., 2017
Ethanol and Acetone extracts of leaves part of plant herb	IMR-32, (Neuroblastima) and HT-29,(Human Colon)Cancer cells, Applied MTT assay	Prevention, Control and strongly inhibited of growth of Cancer cells	Kumar *et al*., 2015
Ethanol extract of aerial parts of plant herb, isolated of flavonoids and labdane diterpenoids compounds	Investigated again various Cancer cells	Reduction, control and potent growth of cancer cells	Prakash *et al*. ,2013; Geethangili *et al*., 2008
Methanol extract of aerial part of plant herb	Investigated again fractionated dichloromethane fraction applied upon various Cancer cells	Inhibited and reduced growth of Cancer cells	Prakash *et al*., 2013;Kumar *et al*.,2008
Methanolic extract of aerial part of plant herb	Dichloromethane fraction applied upon various Cancer cells	Retained and inhibited of Cancers cells	Bisht *et al*., 2011;Mishra *et al*.,2007
Ethanol Andrographolide extract of aerial part of plant herb	Different tumor cells, various type of cancer cells, cell cycle arrest at G0/G1 phase	Reduced and inhibited of tumor cells and various type of Cancers cells through induction of cells cycle inhibitory protein p27, reduced expression cyclin dependent kinase 4	Bisht *et al.*, 2011;Rajagopal *et al*.,2003
Ethanol Andrographolide extract of aerial part of plant herb	Various Cancer cells	Reduced and inhibited of Cancer cells growth, enhanced the tumor necrosis factor-α production ,increased cytotoxic activity of lymphocytes against Cancer cells	Bisht *et al*., 2011; Kumar *et al* .,2003
***Glycyrrhiza glabra* (L.)**			
Aqueous extract of stem part of plant	Vero Cancer cells	Prevention and exhibited potential anticancer activity, Non toxic from high concentration in Cancer Cells	Pandion *et al*., 2017
Ethanolic extract of stem part of plant	He La cancer cells, applied MMT assay and IC-50 values used as a standard	Inhibited, reduced and potent to kills Cancer cells growth	Gnanomoorthy *et al*., 2017
Ethanol extract of stem part of plant	HSP 90 and HT-29 Colon Cancer cells used by trypon blue and MTT assays	Prevention, reduced and confirmed control of Cancer cells growth, highest rate of cell death as measured	Miraj S., 2016; Nourazarion *et al*., 2015
Three species *G.glabra*, *G. uralensis* and *G.inflata* stems extracts of plant	Applied Human clinical trial of Man and Woman Cancer cells	Prevention and control of both three species as a most chemo preventers while *G. inflata* species higher chemo preventive of Cancer cells particularly for women's health	Miraj S., 2016; Dunlap *et al*., 2015
Aqueous stem extract of glycyrrhiza active compound of plants species	Lig C and Lic A, Cancer cells (*In-vivo* and *In-vitro* studies)	Prevention, reduced and stabilized of Cancer cells growth, more potential of plant species as chemo preventive particularly for Woman as a food, dietary supplementary	Miraj S., 2016; Khan *et al*., 2015
Stem and bark part extract of plant	MCT-7 and TCDD Cancer and tumor cells, tumor suppressor genes p53 and p27 and cell cycle related genes	Prevention, reduced and more potent effect of Cancer and tumor cells growth	Miraj S., 2016; Chu *et al*., 2014
Chloroform, Methanol and Aqueous extract of plant	MCF-7 and Vero-Cancer cells, MTT assay, used IC-50 values, Standard 18β-glycyrrhetic acid	Inhibited and reduced growth of Cancer cells and more potential in used plant extracts significantly increase in chloroform extract concentration	Kainsa *et al*., 2012; Rathi *et al*., 2009
Ethanolic extract of plant *G.glabra* novel polyphenol molecule	G2/M Cancer cells and Bcl-2 phosphorylatin tumor cells	Inhibited, reduced and stabilized of Cancer and tumor cells growth	Rafi *et al*., 2002

CONCLUSION: The selective medicinal plants - *Withania somnifera*, *Andrographis paniculata*, and *Glycyrrhiza glabra* were extensively discussed and reviewed in this article which possess remarkable remedial properties against cancers and tumors. However, further extensive research is necessary to investigate their efficacy in *in-vivo* cancer cell lines, animal studies, human clinical trials, research and development, and the design of novel bioactive compounds. These plants contain various bioactive marker compounds that have a rich medicinal potential for anti-cancer and anti-tumor activities.

It is possible to synthetically produce these potent and effective compounds on a large scale. Consequently, there is a pressing need and increasing demand to explore and manufacture newer herbal extract-based drugs derived from these medicinal plants, which offer significant potential for curing and managing cancer and tumor diseases worldwide. Traditional herbs and medicinal plants have been used in Asian countries, including India, for centuries to prevent and treat various ailments, including cancers and tumors, due to their therapeutic properties. These ASU drugs provide therapeutic benefits without significant adverse side effects or toxicity. In conclusion, the findings of this review suggest that these drugs hold promise in ensuring complete assurance and prevention in the treatment of dangerous and painful cancers and tumors, thereby positively impacting public health. The article presents authentic database information on certain plants with reported anti-cancer and anti-tumor activities, both in *in-vitro* and *in-vivo* cell line studies. It serves as a valuable reference for researchers to further explore the potential of herbs in future studies, including novel drug discovery, the development of pharmacopoeial standards, research on related diseases, toxicity studies, and advanced pharmacological and clinical trial research.

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CONFLICTS OF INTEREST: Nil

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