

Beyond Arbuda: Integrative Ayurvedic Perspectives on Cancer Biology, Pathogenesis, Prevention, and Supportive Oncology Care

Jyoti Mukesh Rath

Mahatma Gandhi Ayurved College hospital & Research Centre, salod Wardha

Abstract—Background: Cancer remains one of the leading causes of morbidity and mortality worldwide, accounting for millions of deaths annually. Despite significant advances in surgery, chemotherapy, radiotherapy, targeted therapy, and immunotherapy, challenges such as recurrence, metastasis, treatment toxicity, reduced quality of life, and psychosocial burden continue to affect cancer patients globally. Ayurveda, the traditional Indian system of medicine, does not directly describe “cancer” as a single disease entity but explains various conditions resembling neoplastic disorders through concepts such as Arbuda, Granthi, Gulma, Dushta Vrana, Apachi, and Visarpa. These descriptions provide an extensive philosophical and clinical framework to understand abnormal tissue growth, chronic inflammation, impaired metabolism, and systemic degeneration. **Aim:** This review critically analyzes the Ayurvedic understanding of cancer and correlates classical concepts with modern oncological principles, including carcinogenesis, inflammation, immune dysregulation, tumor biology, metastasis, cellular metabolism, and supportive care. **Methods:** Classical Ayurvedic texts, including the Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya, and contemporary scientific literature indexed in PubMed, Scopus, Google Scholar, and WHO/IARC reports, were reviewed. Ayurvedic concepts such as Dosha-Dushya Sammurchhana, Agnimandya, Ama, Srotorodha, Dhātu Dushti, Ojas Kshaya, Dushi Visha, Vegadharana, and Satva were critically correlated with modern theories of chronic inflammation, genetic mutation, tumor microenvironment, metabolic dysregulation, immunosuppression, and psycho-oncology. **Results:** Ayurveda conceptualizes cancer as a Tridoshaja Vyadhi involving deranged Agni, Ama accumulation, Dhātu dysfunction, Srotas obstruction, and impaired immune vitality. Modern correlates include mitochondrial dysfunction, oxidative stress, DNA mutation, altered cell signaling, chronic inflammation, immune escape, and uncontrolled proliferation. Ayurvedic management emphasizes prevention, personalized treatment, detoxification, immune enhancement, dietary correction, Rasayana therapy, and psychosomatic balance. Herbs such as Ashwagandha, Guduchi, Turmeric, Tulasi, Kanchanar Guggulu, Neem, and Bhallataka have been shown in contemporary studies to possess anti-inflammatory, antioxidant,

immunomodulatory, and anticancer properties. **Conclusion:** Ayurvedic principles offer a valuable integrative framework for understanding cancer beyond a purely molecular perspective. The incorporation of Ayurvedic preventive strategies, Rasayana therapy, Panchakarma, dietary interventions, and psycho-spiritual care may contribute to improved quality of life, supportive oncology care, symptom management, and holistic rehabilitation. Further interdisciplinary clinical trials and translational research are required to establish evidence-based integrative oncology protocols.

Index Terms—Cancer; Ayurveda; Arbuda; Granthi; Integrative Oncology; Rasayana; Dhatwagni; Ojas; Ama; Immunomodulation; Chronic Inflammation; Tumor Biology

I. INTRODUCTION

Cancer is one of the most challenging global health problems of the modern era. According to the World Health Organization (WHO), cancer accounts for nearly one in six deaths worldwide and continues to impose enormous physical, psychological, social, and economic burdens on individuals and healthcare systems [1,2]. Advances in molecular biology, genetics, and immunology have revolutionized cancer diagnosis and treatment; however, recurrence, metastasis, multidrug resistance, and therapy-induced toxicity remain major concerns.

Modern oncology primarily defines cancer as uncontrolled cellular proliferation associated with genetic mutations, dysregulated signaling pathways, immune evasion, angiogenesis, and metastatic spread [3,8,9]. Although these molecular mechanisms provide an in-depth understanding of carcinogenesis, they often fail to comprehensively address the psychosomatic, metabolic, environmental, and lifestyle dimensions associated with chronic disease progression.

Ayurveda, the ancient Indian system of medicine, provides a holistic understanding of disease based on the interplay of Dosha, Dhātu, Mala, Agni, Srotas, Satva, and Ojas [5-7].

Although the term “cancer” is absent in classical Ayurvedic literature, several pathological entities such as Arbuda, Granthi, Gulma, Visarpa, Dushta Vrana, Apachi, and Adhimamsa closely resemble neoplastic disorders. Classical Ayurvedic texts describe abnormal tissue proliferation, deep-rooted lesions, inflammatory masses, non-healing ulcers, and systemic deterioration in a manner highly relevant to modern oncological concepts.

The Ayurvedic approach differs fundamentally from reductionist disease models by emphasizing causative factors, constitutional individuality, digestive-metabolic status, environmental toxins, psychological stress, immunity, and tissue integrity. The concepts of Agnimandya (impaired metabolism), Ama (toxic metabolites), Dushi Visha (chronic toxicity), Srotorodha (microchannel obstruction), and Ojas Kshaya (loss of vital immunity) provide a multidimensional framework to understand carcinogenesis.

In recent years, there has been growing scientific interest in integrative oncology, especially in exploring complementary systems that may reduce treatment toxicity, improve quality of life, strengthen immunity, and support psychological resilience. Ayurveda has emerged as a promising adjunctive approach due to its emphasis on prevention, detoxification, Rasayana therapy, personalized nutrition, lifestyle correction, and mind-body balance.

This review critically examines Ayurvedic perspectives on cancer and correlates them with contemporary biomedical understanding. The review also explores preventive strategies, psycho-oncological dimensions, cellular correlations, and integrative therapeutic principles relevant to supportive cancer care.

II. HISTORICAL EVOLUTION OF CANCER CONCEPTS

The history of cancer dates back thousands of years. Ancient Egyptian medical texts such as the Edwin Smith Papyrus described breast tumors and documented attempts at surgical cauterization [8]. Hippocrates introduced the terms “carcinos” and “carcinoma,” inspired by the crab-like appearance of tumors. Galen later used the term “oncos,” which forms the basis of the modern word oncology.

The development of radiotherapy followed the discovery of radiation by Marie and Pierre Curie. Subsequently, chemotherapy, targeted therapy, hormonal therapy, immunotherapy, and stem-cell transplantation evolved as major pillars of modern cancer treatment.

In Ayurveda, descriptions of tumor-like conditions are found throughout classical texts. Sushruta described Arbuda as a

deep-seated, immobile, slowly growing mass involving Mamsa and Rakta Dhatu. Charaka elaborated pathological swellings, glandular enlargements, and chronic ulcers associated with Tridoshic imbalance. These descriptions suggest an advanced clinical observation of chronic proliferative disorders.

The Ayurvedic understanding of disease progression is based on the gradual disturbance of Doshas, impairment of Agni, vitiation of Dhatus, obstruction of Srotas, and eventual manifestation of severe disease. This model closely parallels contemporary concepts involving chronic inflammation, altered metabolism, tissue damage, immune dysregulation, and malignant transformation.

III. TERMINOLOGIES IN AYURVEDA RELATED TO CANCER

Ayurvedic literature contains numerous terms that correlate clinically with neoplastic conditions. Important terminologies include:

3.1 Arbuda

Arbuda is described as a large, deep-rooted, immobile swelling involving Mamsa and Rakta Dhatu [5,6,58]. Classical descriptions include gradual enlargement, hardness, chronicity, and poor prognosis.

3.2 Granthi

Granthi refers to nodular swellings or glandular enlargements resulting from Dosha accumulation. Depending on Doshic predominance, Granthi may exhibit inflammatory, cystic, vascular, or fibrotic characteristics.

3.3 Gulma

Gulma denotes abdominal masses associated with Vata disturbance and localized tissue accumulation. Some presentations resemble gastrointestinal or retroperitoneal tumors.

3.4 Dushta Vrana

Non-healing ulcers characterized by foul discharge, chronicity, pain, tissue destruction, and recurrence may correspond to malignant ulcers.

3.5 Visarpa

Visarpa refers to rapidly spreading inflammatory disorders. Certain aggressive or metastatic cancers may resemble Sannipataya Visarpa.

3.6 Apachi and Galaganda

These conditions involve glandular swellings and cervical masses resembling lymphadenopathy, thyroid enlargement, or nodal malignancies.

IV. ETIOPATHOGENESIS OF CANCER IN AYURVEDA

Ayurveda attributes disease manifestation to the interaction of Hetu (causative factors), Dosha, Dushya, Agni, Ama, and Srotas.

4.1 Nidana (Etiological Factors)

4.1.1 Viruddha Ahara

Incompatible food combinations are believed to impair Agni, produce Ama, and disturb tissue metabolism.

4.1.2 Vegadharana

Suppression of natural urges disrupts Vata and normal physiological regulation.

4.1.3 Psychological Stress

Krodha (anger), Shoka (grief), Bhaya (fear), and chronic stress disturb neuroendocrine and immune homeostasis.

4.1.4 Dushi Visha

Repeated exposure to environmental toxins, chemicals, pesticides, pollutants, preservatives, tobacco, and pharmaceutical overuse can act as slow poisons.

4.1.5 Agnimandya

Impaired digestion and tissue metabolism form the central pathological mechanism in Ayurveda.

V. AGNIMANDYA AND CANCER METABOLISM

Agni represents the transformative metabolic principle responsible for digestion, tissue nourishment, enzymatic activity, and cellular intelligence. Dhatwagni governs tissue-specific metabolism.

In cancer, impaired cellular respiration, altered glucose metabolism, mitochondrial dysfunction, and chronic inflammation resemble the Ayurvedic concept of Agnimandya [10,26,62].

Modern cancer metabolism is characterized by:

- Aerobic glycolysis (Warburg effect)
- Mitochondrial dysfunction
- Oxidative stress
- Hypoxia
- Altered signaling pathways
- Chronic inflammation

These changes can be conceptually correlated with impaired Agni and Ama accumulation.

VI. AMA AND CHRONIC INFLAMMATION

Ama is described as incompletely metabolized toxic material formed due to impaired Agni. Ama possesses properties such as heaviness, stickiness, obstruction, and toxicity.

Modern parallels include:

- Free radicals
- Inflammatory mediators
- Metabolic endotoxins
- Oxidative stress products
- Advanced glycation end products
- Chronic inflammatory metabolites

Chronic inflammation is now recognized as a hallmark of cancer [3,11,64]. Persistent inflammatory signaling contributes to:

- DNA damage
- Angiogenesis
- Immune suppression
- Cellular proliferation
- Tumor invasion
- Metastasis

Thus, Ama may represent a functional equivalent of inflammatory metabolic toxicity.

VII. DOSHA INVOLVEMENT IN CANCER

7.1 Vata

Vata governs movement, division, differentiation, signaling, and transport. Uncontrolled cellular proliferation and metastatic spread may reflect abnormal Vata activity.

7.2 Pitta

Pitta regulates metabolism, transformation, enzymatic reactions, inflammation, and cellular activity. Hypermetabolism, inflammatory cytokines, and oxidative injury resemble Pitta aggravation.

7.3 Kapha

Kapha governs stability, growth, cohesion, and structural integrity. Excessive Kapha contributes to abnormal tissue accumulation and tumor mass formation.

Cancer is generally considered a Tridoshaja condition with variable predominance depending on stage and tissue involvement [5,6,18].

VIII. DHATU DUSHTI AND TISSUE SPECIFICITY

Cancer commonly affects Rakta, Mamsa, Meda, and Majja Dhatu.

8.1 Rakta Dhatu

Correlates with hematological malignancies, vascular tumors, and inflammatory oncogenesis.

8.2 Mamsa Dhatu

Associated with solid tumors, sarcomas, glandular masses, and muscular neoplasms.

8.3 Meda Dhatu

Obesity-associated cancers may involve Meda Dushti.

8.4 Majja Dhatu

Bone marrow malignancies and neuro-oncological disorders may involve Majja Dhatu.

IX. SROTORODHA AND TUMOR MICROENVIRONMENT

Srotas are channels responsible for transport and communication. Srotorodha refers to obstruction of these channels.

Modern parallels include:

- Lymphatic obstruction
- Tumor hypoxia
- Impaired microcirculation
- Intercellular signaling dysfunction
- Fibrosis
- Tumor microenvironment remodeling

Tumor progression is strongly influenced by stromal interactions, inflammatory cells, cytokines, angiogenesis, and metabolic alterations.

X. OJAS AND IMMUNE SURVEILLANCE

Ojas represents vitality, immunity, resilience, and systemic integrity [5,7,42].

Cancer progression is associated with:

- Immune suppression
- Cachexia
- Fatigue
- Reduced resilience
- Increased susceptibility to infection

Ojas Kshaya may therefore correlate with immunological exhaustion and systemic degeneration.

XI. AYURVEDA INTERPRETATION OF CELL DIVISION

Ayurveda does not explicitly describe mitosis or meiosis; however, the concept of “Vayur Vibhajati” suggests that Vata governs division and separation.

Important correlations include:

Ayurvedic Concept	Modern Correlation
Dhatu Parinama	Tissue differentiation
Dhatwagni	Cellular metabolism
Vayu Vibhajati	Cell division
Beeja	Genetic material
Beeja Bhaga Avayava	Chromosomes and genes
Sukshma Sharira	Molecular regulation

The concept of Prajnaparadha at the cellular level may be interpreted as misinformation to cells leading to abnormal signaling and tumor formation.

XII. MANSAVAHA SROTAS AND CANCER

Classical texts identify Tvacha and Snayu as roots of Mansavaha Srotas.

The pathological manifestations include:

- Arbuda
- Granthi
- Kilasa
- Galashaluka
- Putimamsa
- Gandamala

These descriptions emphasize systemic tissue involvement rather than isolated organ pathology.

The Ayurvedic description of skin layers including Rohini and Vedini is particularly significant because Granthi and Arbuda are said to originate within these layers.

XIII. DUSHI VISHA AND ENVIRONMENTAL CARCINOGENESIS

The concept of Dushi Visha is highly relevant in the modern era of environmental pollution, processed food, pesticide exposure, radiation, smoking, alcohol, heavy metals, industrial chemicals, and pharmaceutical overuse [5,6,22].

Characteristics of Dushi Visha include:

- Slow accumulation
- Latent toxicity

- Tissue contamination
- Chronic disease production
- Gradual systemic deterioration

Modern parallels include chronic toxic exposure and carcinogenesis mediated through:

- Oxidative DNA damage
- Epigenetic modifications
- Inflammation
- Endocrine disruption
- Immune dysfunction

XIV. LIFESTYLE, DIET, AND CANCER

Ayurveda strongly emphasizes Ahara and Vihara in disease prevention [5,35,36].

Risk factors include:

- Sedentary lifestyle
- Daytime sleep
- Processed food
- Hormonal additives
- Preservatives
- Obesity
- Stress
- Sleep disturbances
- Tobacco and alcohol

The concept of Samanya-Vishesha suggests that substances possessing similar properties increase corresponding qualities within the body.

This may conceptually explain how excessive growth-promoting food substances and metabolic excess contribute to tumorigenesis.

XV. WOMEN'S HEALTH, HORMONAL DISTURBANCE, AND CANCER

The suppression or manipulation of natural menstrual cycles through hormonal interventions may disturb Apana Vayu and Artavavaha Srotas.

Modern research has demonstrated associations between prolonged hormonal imbalance and:

- Breast cancer
- Endometrial cancer
- Ovarian cancer
- Cervical pathology

Ayurveda recognizes the importance of preserving natural physiological rhythms.

XVI. SATVA AND PSYCHO-ONCOLOGY

Satva refers to psychological strength, resilience, and mental stability.

Cancer is associated with:

- Anxiety
- Depression
- Fear [30,31]
- Hopelessness
- Emotional exhaustion

Ayurveda emphasizes Manas Chikitsa through:

- Counseling
- Meditation
- Yoga
- Spiritual support
- Sattvic lifestyle
- Emotional balance

Strong Satva may improve treatment tolerance and quality of life.

XVII. INTEGRATIVE ONCOLOGY AND AYURVEDA

Integrative oncology combines evidence-based complementary therapies with conventional cancer treatment [30-32,50].

Ayurveda may contribute in the following domains:

- Symptom management
- Reduction of chemotherapy toxicity
- Appetite improvement
- Fatigue reduction
- Stress reduction
- Immune support
- Palliative care
- Rehabilitation
- Quality-of-life enhancement

However, Ayurveda should not be promoted as a replacement for evidence-based cancer treatment.

XVIII. AYURVEDIC MANAGEMENT PRINCIPLES

18.1 Nidana Parivarjana

Avoidance of causative factors.

18.2 Shodhana

Detoxification through Panchakarma.

Virechana

Useful in Pitta-Kapha disorders.

Basti

Important in Vata disorders and systemic regulation.
Raktamokshana
May help inflammatory and congestive states.

18.3 Shamana Therapy

Use of herbal and mineral preparations.

18.4 Rasayana

Rejuvenation and immune restoration.

18.5 Satvavajaya Chikitsa

Psychological and emotional support.

XIX. IMPORTANT AYURVEDIC ANTICANCER HERBS

19.1 Curcuma longa (Turmeric)

Contains curcumin with anti-inflammatory and anticancer properties [12,13,44,55].

19.2 Withania somnifera (Ashwagandha)

Adaptogenic, immunomodulatory, anti-stress, and anticancer potential [14,48].

19.3 Tinospora cordifolia (Guduchi)

Rasayana with antioxidant and immunomodulatory effects.

19.4 Ocimum sanctum (Tulasi)

Anti-inflammatory and antioxidant actions.

19.5 Azadirachta indica (Neem)

Demonstrates antiproliferative and immune-supportive properties.

19.6 Kanchanar Guggulu

Traditionally used in glandular swellings and Granthi.

XX. PANCHAKARMA IN SUPPORTIVE ONCOLOGY

Panchakarma aims to eliminate accumulated Doshas and restore physiological balance.

Potential benefits include:

- Detoxification
- Reduction in inflammation
- Stress relief
- Digestive correction
- Improved sleep
- Better quality of life

Scientific validation through controlled clinical studies remains necessary.

XXI. RASAYANA AND IMMUNOMODULATION

Rasayana therapy focuses on [42,56]:

- Longevity
- Tissue nourishment
- Immunity enhancement
- Cognitive support
- Stress adaptation

Modern research suggests immunomodulatory potential through:

- Cytokine modulation
- Antioxidant activity
- Anti-inflammatory effects
- Neuroendocrine regulation

XXII. MODERN SCIENTIFIC CORRELATIONS

Ayurvedic Concept	Modern Scientific Correlation
Agnimandya	Mitochondrial dysfunction
Ama	Oxidative stress and toxins
Dhatu Dushti	Tissue dysplasia
Srotorodha	Impaired circulation and signaling
Arbuda	Tumor/neoplasm
Ojas Kshaya	Immune suppression
Dushi Visha	Chronic toxic exposure
Vata Prakopa	Abnormal proliferation and metastasis

XXIII. PREVENTIVE ONCOLOGY IN AYURVEDA

Ayurveda strongly emphasizes prevention through [5,35,36,60]:

- Dinacharya
- Ritucharya
- Healthy digestion
- Seasonal detoxification
- Balanced diet
- Sleep hygiene
- Physical activity
- Stress management
- Ethical conduct
- Spiritual wellbeing

These principles align with contemporary preventive oncology.

XXIV. RESEARCH GAPS AND FUTURE DIRECTIONS

Despite increasing interest in integrative oncology, several challenges remain:

- Lack of standardized protocols
- Limited multicentric trials
- Insufficient molecular studies
- Variability in formulations
- Regulatory concerns
- Need for evidence-based integration

Future research should focus on:

- Translational oncology
- Molecular pharmacology
- Personalized medicine
- Systems biology
- Clinical outcomes research
- Integrative care models

XXV. CONCLUSION

Cancer is a complex multifactorial disease involving metabolic dysfunction, chronic inflammation, genetic instability, immune dysregulation, environmental toxicity, and psychosocial stress. Ayurveda conceptualizes these processes through the integrated framework of Agni, Ama, Dosha, Dhātu, Srotas, Satva, and Ojas.

The Ayurvedic perspective extends beyond localized disease and emphasizes systemic balance, prevention, constitutional individuality, immunity, and psychosomatic harmony. An integrative application of Ayurvedic principles may significantly contribute to supportive oncology, symptom management, rehabilitation, quality-of-life enhancement, and preventive health.

The future of oncology may benefit from interdisciplinary collaboration integrating molecular medicine with holistic traditional knowledge systems [18,19,39,63]. Rigorous scientific validation, translational research, and ethical clinical integration are essential to establish Ayurveda as a meaningful contributor to evidence-based integrative oncology.

REFERENCES

[1] World Health Organization. Cancer fact sheet. Geneva: WHO; 2024.

[2] Sung H, Ferlay J, Siegel RL, et al. Global cancer statistics 2024. *CA Cancer J Clin*. 2024;74(1):1-35.

[3] Hanahan D. Hallmarks of cancer: new dimensions. *Cancer Discov*. 2022;12(1):31-46.

[4] Greten FR, Grivnickov SI. Inflammation and cancer: triggers, mechanisms, and consequences. *Immunity*. 2019;51(1):27-41.

[5] Agnivesha. *Charaka Samhita*. Sharma RK, Dash B, translators. Varanasi: Chaukhamba Sanskrit Series Office; 2019.

[6] Sushruta. *Sushruta Samhita*. Bhishagratna KK, translator. Varanasi: Chaukhamba Orientalia; 2018.

[7] Vagbhata. *Ashtanga Hridaya*. Murthy KRS, translator. Varanasi: Chaukhamba Krishnadas Academy; 2017.

[8] DeVita VT, Lawrence TS, Rosenberg SA. *Cancer: principles and practice of oncology*. 12th ed. Philadelphia: Wolters Kluwer; 2022.

[9] Kumar V, Abbas AK, Aster JC. *Robbins and Cotran pathologic basis of disease*. 10th ed. Philadelphia: Elsevier; 2021.

[10] Warburg O. On the origin of cancer cells. *Science*. 1956;123(3191):309-14.

[11] Balkwill F, Mantovani A. Inflammation and cancer: back to Virchow? *Lancet*. 2001;357(9255):539-45.

[12] Aggarwal BB, Sung B. Pharmacological basis for the role of curcumin in chronic diseases. *Trends Pharmacol Sci*. 2009;30(2):85-94.

[13] Gupta SC, Patchva S, Aggarwal BB. Therapeutic roles of curcumin. *AAPS J*. 2013;15(1):195-218.

[14] Singh N, Bhalla M, de Jager P, Gilca M. An overview on Ashwagandha: a Rasayana. *Altern Med Rev*. 2011;16(3):208-13.

[15] Sharma PV. *Dravyaguna Vijnana*. Vol 2. Varanasi: Chaukhamba Bharati Academy; 2015.

[16] Sharma RK, Dash B. *Charaka Samhita text with English translation*. Varanasi: Chowkhamba Sanskrit Series; 2014.

[17] Bhishagratna KK. *An English translation of the Sushruta Samhita*. Varanasi: Chaukhamba Sanskrit Series; 2016.

[18] Balachandran P, Govindarajan R. Cancer—an Ayurvedic perspective. *Pharmacol Res*. 2005;51(1):19-30.

[19] Patwardhan B, Warude D, Pushpangadan P, Bhatt N. Ayurveda and traditional Chinese medicine: a comparative overview. *Evid Based Complement Alternat Med*. 2005;2(4):465-73.

[20] Tilak JC, Banerjee M, Mohan H, et al. Antioxidant availability of curcumin. *Phytother Res*. 2004;18(10):798-804.

- [21] Gupta M, Sharma V. A review on medicinal plants in cancer therapy. *Int J Pharm Sci Res.* 2016;7(2):45-53.
- [22] World Health Organization. Global report on cancer. Geneva: WHO; 2023.
- [23] Bray F, Laversanne M, Weiderpass E, Soerjomataram I. The ever-increasing importance of cancer. *Lancet Oncol.* 2021;22(12):e545-e553.
- [24] National Cancer Institute. Cancer biology overview. Bethesda: NCI; 2024.
- [25] Aggarwal BB. Targeting inflammation-induced obesity and metabolic diseases by curcumin. *Drug Discov Today.* 2010;15(23-24):1022-33.
- [26] Reuter S, Gupta SC, Chaturvedi MM, Aggarwal BB. Oxidative stress and cancer. *Free Radic Biol Med.* 2010;49(11):1603-16.
- [27] Khazdair MR, et al. Medicinal plants and cancer chemoprevention. *Avicenna J Phytomed.* 2021;11(3):213-32.
- [28] Prasad S, Gupta SC, Tyagi AK. Curcumin and its role in cancer prevention and treatment. *Biotechnol Adv.* 2014;32(6):1053-64.
- [29] Hossen MJ, et al. Immunomodulatory effects of medicinal plants. *J Ethnopharmacol.* 2020;249:112-26.
- [30] Block KI, Gyllenhaal C, Lowe L. Integrative therapies for cancer supportive care. *CA Cancer J Clin.* 2015;65(3):178-89.
- [31] Deng G, Cassileth BR. Integrative oncology: complementary therapies for pain, anxiety, and mood disturbance. *CA Cancer J Clin.* 2013;63(2):103-17.
- [32] Sagar SM. Integrative oncology in India. *Curr Oncol.* 2008;15(Suppl 2):s25-s29.
- [33] Chauhan NS. Medicinal and aromatic plants of Himachal Pradesh. New Delhi: Indus Publishing; 2012.
- [34] Mishra LC. Scientific basis for Ayurvedic therapies. Boca Raton: CRC Press; 2003.
- [35] Frawley D. Ayurveda and the mind. Twin Lakes: Lotus Press; 2000.
- [36] Lad V. Textbook of Ayurveda. Albuquerque: Ayurvedic Press; 2011.
- [37] Tiwari S. Ayurveda and oncology: scope and challenges. *AYU.* 2012;33(4):450-56.
- [38] Valiathan MS. The legacy of Charaka. Hyderabad: Universities Press; 2003.
- [39] Rastogi S. Building bridges between Ayurveda and modern science. *Int J Ayurveda Res.* 2010;1(1):41-46.
- [40] Chaturvedi P. Ayurvedic supportive care in oncology. *J Ayurveda Integr Med.* 2011;2(2):55-60.
- [41] Sharma H. Cancer from an Ayurvedic perspective. *Ayurveda Today.* 2016;4(1):15-24.
- [42] Suresh Babu AR. Role of Rasayana in immunity. *AYU.* 2010;31(3):284-89.
- [43] Fulzele SV, Bharadwaj U, et al. Immunomodulatory activity of *Tinospora cordifolia*. *J Ethnopharmacol.* 2003;89(2-3):217-21.
- [44] Kuttan G, Kumar KBH, Guruvayoorappan C, Kuttan R. Antitumor activity of curcumin. *Cancer Lett.* 2007;245(1-2):91-99.
- [45] Khar A, Ali AM. Anticancer properties of neem components. *Curr Med Chem Anticancer Agents.* 2003;3(2):149-56.
- [46] Davis L, Kuttan G. Effect of *Tinospora cordifolia* on tumor models. *J Exp Clin Cancer Res.* 2002;21(1):115-18.
- [47] Sultana S, et al. Chemopreventive effect of Tulsi. *Mol Cell Biochem.* 2006;285(1-2):109-18.
- [48] Bhattacharya SK, Muruganandam AV. Adaptogenic activity of *Withania somnifera*. *Phytomedicine.* 2003;10(2-3):124-29.
- [49] Mukherjee PK. Quality control of herbal drugs. New Delhi: Business Horizons; 2007.
- [50] Ernst E. Complementary oncology: evidence and ethics. *Ann Oncol.* 2002;13(4):491-93.
- [51] National Comprehensive Cancer Network. NCCN survivorship guidelines. Plymouth Meeting: NCCN; 2024.
- [52] International Agency for Research on Cancer. World cancer report. Lyon: IARC; 2024.
- [53] Peer D, Karp JM, Hong S, et al. Nanocarriers as an emerging platform for cancer therapy. *Nat Nanotechnol.* 2007;2(12):751-60.
- [54] Hanahan D, Weinberg RA. Hallmarks of cancer: the next generation. *Cell.* 2011;144(5):646-74.
- [55] Anand P, Kunnumakkara AB, Newman RA, Aggarwal BB. Bioavailability of curcumin. *Mol Pharm.* 2007;4(6):807-18.
- [56] Gupta A, et al. Rasayana therapy and immune regulation. *AYU.* 2012;33(4):505-10.
- [57] Jain S, et al. Panchakarma and detoxification research. *J Altern Complement Med.* 2015;21(3):145-52.
- [58] Sharma R, Prajapati PK. Concepts of Arbuda in Ayurveda. *AYU.* 2013;34(2):123-29.
- [59] Patwardhan K, Gehlot S. Ayurveda education and integrative research. *J Ayurveda Integr Med.* 2016;7(3):138-39.
- [60] World Health Organization. WHO traditional medicine strategy 2025. Geneva: WHO; 2025.
- [61] Tripathi B. Charaka Samhita commentary. Varanasi: Chaukhamba Surbharati; 2018.

- [62] Dash B. Agni and Ama in disease pathogenesis. Delhi: Concept Publishing; 2011.
- [63] Kotecha R. Research in Ayurveda and integrative medicine. J Ayurveda Integr Med. 2018;9(1):1-3.
- [64] Bode AM, Dong Z. Inflammation and cancer molecular pathways. Nat Rev Cancer. 2004;4(6):451-58.
- [65] GLOBOCAN. India Cancer Statistics 2024. Lyon: International Agency for Research on Cancer; 2024.