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A Review On Marketed Herbal Formulations With Immuno-Modulating Potential

[1]Vishal Vats, [1]Kunal, [1*]Anju Dhiman, [2]Sandeep Dhiman, [3] Chhavi Singla, [4]Asha Sharma**
[1] Department of Pharmaceutical Sciences, Maharshi Dayanand University, Rohtak-124001, Haryana, India
[2]Kinapse India Scientific Services Pvt. Ltd., Gurugram -122001, Haryana, India
[3]Department of Pharmacy, School of Health Sciences, Sushant University Erstwhile Ansal University, Gurugram, Haryana- 122003, India
[4] Department of Botany, Maharshi Dayanand University, Rohtak-124001, Haryana, India

ABSTRACT:

The present paper is an attempt to review about the various herbal marketed formulations available in the Indian market such as Chyawanprash, Sanjivanivati, Revital- H, Ashwagandha powder, Shilajit, Brahmi tablets, Safed musali powder, Amalaki capsules, Aloevera gel, Immunity booster capsules to boost the immunity. These herbal formulations are successfully accepted as adjuvant rehabilitators by the Indian population to negate against constant exposure to stress, deleterious environment pollution side effects, to combat against infections, viral diseases, cancer, diabetes, cardiovascular disorders, neuro and psychological disorders, inflammations and to boost immunity as a general tonic. In this paper the active biomolecules present in various herbal drug species such as Embelicaribes, Zingiber officinale, Panax pseudoginseng, Withaniasomnifera, Chlorophytum borivilianum etc and their reported pharmacological study as an immunomodulator were reviewed.
A systematic search strategy was employed using keywords to search the literature in 4 key medical databases: PubMed®, Web of Science®, ResearchGate® and SciVerse Scopus® and those study were considered which have relevant data related to Chyawanprash, Sanjivanivati, Revital- H, Ashwagandha powder, Shilajit, Brahmi tablets, Safed musali powder, Amalaki capsules, Aloevera gel, Immunity booster capsules and immunomodulatory pharmacological activity of herbal drugs present in these formulations.
In this paper we summarize data related to these formulations which have scientifically proven immune-modulation potential and these formulations had been accepted by people worldwide to improve their immunity and these formulations are also helpful in treatment of other disorders too.

KEYWORDS: Amalaki capsules, Aloevera gel, Ashwagandha powder, Biomolecules, Brahmi tablets, Chlorophytum borivilianum, Chyawanprash, Herbal formulations, Immunity, Immuno-modulators, Shilajit, Withaniasomnifera.

INTRODUCTION:

Human beings always live in the close contact of microbes that generally floats in the surrounding environment which is respomsible for causing various infections. The safeguard and cure of these infections is generally dependent over the response of immunity of a particular human being. Since previous few years, viruses and bacteria develop resistance against various antibiotics due to which it become difficult to treat them with conventional doses. When the dose of synthetic medicine increases then the toxicity and several adverse effects may get increased which leads to hazardous effect on the health of patient. Therefore, from ancient time various traditional systems of medicines across globe have been used (Nandal et al., 2020). They contain various plants based immuno-modulatory formulations that increases the immunity of human beings and helps them to defend and fight against viral infections .It has long been recognized that natural products represent the richest source of high chemical diversity, providing the basis for identification of novel scaffold structures that serves as starting points for rational drug design (Dhiman, 2020). Human civilization has used natural sources for maintaining diverse health-related issues since time immortal by traditional healers (Dhiman et al., 2017). Literature revealed that the ingestion of bioactive compound from fruits and vegetables is associated with the reduced risk of many common forms of cancer and many other harmful diseases like tuberculosis (Garg V, 2019) (Jijja & Rai, 2019) (Gupta et al., 2019) . The early symptoms developed can be characterized by dry cough, fever, lethargy and weight loss (Xu et al., 2021). Herbal remedies derived from plants and their products have

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been used since ancient times (Saini et al. 2020a; Saini et al. 2018) as therapeutic agents, attributed to various pharmacological activities v.i.z. antioxidant, anti-inflammatory, analgesic, anti-fertility, antimutagenic, larvicidal, anthelmintic activity etc. (Saini et al, 2020b; Dhiman et al., 2017). Several medicinal plants are widely being used in Ayurvedic preparations (Shirwaikar et al. 2007) and contain a large number of secondary plant metabolites, which are of great therapeutic significance (Saini et al., 2016). Flavonoids are the main components of a healthy diet (Dhiman et al. 2016).
Alongwith herbal medicines, nutraceuticals and food supplements are claimed to be beneficial in several disease conditions which include cardiovascular disorder, neurodegenerative disorders, metabolic disorders, liver disorders and cancer prevention (Bansal & Dhiman, 2020) (Jijja, et al., 2017). These may be explored for the production of natural medicinal formulations in pharmaceutical drug industries for several disorders on account of potential antioxidant activity (Bhilana et al., 2018) (Nandal et al., 2020). Due to fascinating properties and biomedical applications, there is an immense necessity to explore newer prospective in the field of complementary and alternative medicine. This is one of the reasons that efforts have been directed to discover promising therapeutic agents from natural sources.

In Ayurveda system there are many formulations that exhibit immuno-modulatory property such as Chyawanprashchurna, Immunity booster capsule,Amalaki powder, Sanjivanivati powder, Ashwagandha powder, Safed musli powder, Shilajit, Revital-H, Aloe-vera gel, Brahmi tablets etc. which helps in boosting the immunity of a person.These formulations contain herbal species such as Embelicaribes, Zingiber officinale, Panax pseudoginseng,Withaniasomnifera, Chlorophytum borivilianum etc., which shows immunomodulatory effect with other potential effects that helps in treatment of disorders like cancer, diabetes, cardiovascular disorders, neuro and psychological disorders, inflammations etc.
Therefore, these formulations can be used as an alternative potential remedy in treatment and prevention from viral diseases.

VARIOUS HERBAL FORMULATIONS:

1) CHYAWANPRASH:
Chyawanprash comprises of two lexes, “chywan” and “prasha” which denotes ‘degenerative change’ and “a remedy or food that can be consumed and competent for human being” respectively.
It has been used since ancient times for the purpose of enhancement of health and safeguard from diseases and for rejuvenating purposes.The herbal composition of Chyawanprash with their active biomolecules and their pharmacological actions are listed in Table 1.

Table 1: Herbal composition of Chyawanprash with their major active biomolecules/constituents and pharmacological effects

S. No.	Medicinal Plants/Special Additives	Family	Major Active Biomolecules	Pharmacological Activity
1	Withaniasomnifera (Ashwagandha)	Solanaceae	Withananinine, Anaferine, Chlorogenic acid, Somniferinine, Pseudo-withanine, Withasomnine, Visamine, Withananine, Anahygrine, Tropine, Somniferine, Isopelletierine, Withaferin A, Pseudotropine, Cuscohygrine, Somnine, Withanine.	Immunomodulatory ,Analgesic, Antistress, Rejuvenating, Adjuvant to chemotherapy, Cardiovascular protection, Hypo glycemic and Hypo cholesterolemic, Growth-promoting, Anti-arthritic, Rasayana, Adaptogenic
2	Tinospora cordifolia (Guduchi, Chinnodbhava)	Menispermaceae	Choline, Columbin, Cordifolide, Tinosporide, Diterpenoid furano lactone, Palmatine, Tinosporine, Cordifol, b-Sitosterol, Heptacosanol, Tinosporidine,	Immunomodulatory,Cyt oprotective, Antibacterial, Anti-inflammatory, Anticonvulsant, Antidiabetic,

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			Tembertarine, Magniflorine, Tinosporaside, Clerodane Furano diterpene, Berberine, Tinosporin	Antihepatotoxic, Anti mutagenic, Antiulcer, Hypolipidemic, Antispasmodic, Insecticidal, Antioxidant, Antidiarrheal, Anti cancer, Antifungal, Antitumour, Bronchiodilatory
3	Piper longum (Pippali)	Piperaceae	Derivatives of Pyridine, Phenol ethers, Cinnamic acid, Pteridines, derivatives of steroids, Napthalenes, derivatives of caboxylic acid, Phenanthrenes, Steroids, Carboxylic acids, Phenylpropanoic acids, Oxanes, Isoflavonoids, Pyridines, derivatives of Phenanthrenes, derivatives of Cinnamic acid, derivatives of Pteridine	Immunomodulatory[9], Anti- inflammatory, Anti-diabetic, Anti-apoptosis, Anti arthritic, Antioxidant, Antimicrobial, Anti-infertility, Antitumour, Anti-stress, Hepato-protective
4	Sida cordifolia (Bala, Bariyara)	Malvaceae	Sterculic acid, Indole alkaloids, Pseudoephedrine, Ecdysterone, Coronaric acid, Hypaphorine, Malvalic acid, Stearic, Palmitic and β–Sitosterol, Ephedrine	CNS depressant, Analgesic and anti-inflammatory, Hypotensive, Hepatoprotective, Anti microbial, Adaptogenic, Anti Parkinson's, Wound healing, Anti Hypertriglyceridemic, Hypoglycemic, Anti–oxidant
5	Bacopa monnieri (Brahmi)	Plantaginaceae	Pseudojujubacogenin, Wogonin, Hydrocotyline, Oroxindin, Brahmine, Brahmic acid, D-mannitol, Thanakunicide, Herpestine, Brahamoside, Betulic acid, Acid A, Asiaticoside, Stigmastarol, Luteonin, Bacoside A, β-Sitosterol, Monnierin, Apigenin, Betulinic acid, Isobrahmic acid, Bacoside B, Bacopasaponins, Jujubacogenin, Brahminoside	Immunomodulatory , Hepatoprotective, Gstroprotective, Cardiovascular, Antispasmodic, Anxiolytic, Anti stress, Anti oxidant, Analgesic, Anti-inflammatory, Antideprassant, Anticonvulsive, Anti-cancer, Anti-asthmatic
6	Asparagus racemosus (Shatavari)	Liliaceae (Asparagaceae)	γ-Linoleinic acids, Hyperoside, Diosgenin, Oligospirostanoside, 4, 6-Dihydryxy-2-O (-2-hydroxy isobutyl) benzaldehyde, Sitosterol, Rutin, Sarsapogenin, Quercitin, Dihydrophenantherene, Aspargamine A, Shatvarin I to	Immunomodulatory, Antioxidant, Antidepressant, Anti-inflammatory, Improves cognition, Aphrodisiac, Diuretic, Anti-stess, Antineoplastic, Molluscicidal,

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			VI, Quercetin 3-Glucourbnides, Racemofuran, Undecanylcetanoate	Antihepatotoxic, Antibacterial, protects against Amnesia
7	Emblicaofficinalis(Amla)	Phyllanthaceae	Ascorbic acid, Trigallayl glucose, Aspartic acid, Quercetin, Chebulagic acid, Gallic acid, Emblicanin A&B, Geraniin, Methyl gallate, Ellagic acid, Cystine, Pedunculagin, Phyllantidine, Proline, Chebulinic acid, Phyllembein, Pectin, Phyllantine, Kaempferol, Lysine, Citric acid, Glutamic acid, Punigluconin, Corilagin, Ellagotannin, Alanine	Immunity enhancer, Atherosclerosis, Diabetes, Diarrhoea, High blood pressure, Obesity, High cholesterol, Joint pain, Cancer, hypertension, Influenza, chronic cold and cough, AIDS, chronic fatigue, antioxidant, hair loss, anti ageing, inflammatory conditions
8	Tribulus terrestris (Gokhru, Gokshur)	Zygophyllaceae	Kaempferol-3-O-glycoside, Kaempferol, Ruscogenin, Hecogenin, Neogitogenin, Tribuloside, Protodioscin protogracillin, Chlorogenin, Tigogenin, Kaempferol-3-glucoside, Sarsasapogenin, Neohecogenin, Gitogenin, Quercetin-3-O-rutinoside, Quercetin-3-O-glycoside, Neotigogenin, Diosgenin, Kaempferol-3-rutinoside	Immunomodulatory,Aphrodisiac,Antiurolithic, Mood elevator, Diuretic, Cardiotonic, Antidiabetic,Hypolipidemic,Hepatoprotective,Analgesic,Antiinflammatory,Anticancer.
9	Adhatodavasica (Vasaka, Vasa, Arusa)	Acanthaceae	Aasicoline, Vasicine acetate, 2-Acetyl benzyl amine, Aasicinone, Adhatodine, Vasicine.	Immunomodulatory,Cardiovascular, Bronchodilator, Respiratory disorders, Cholagogue, Anti-allergic, Antiulcer, Expectorant
10	Aegle marmelos (Bael, Bel)	Rutaceae	Rutin, Quercetin, Gallic acid.	Immunomodulator, Radioprotective, Gastroprotective, Antidiarrheal, Anti-ulcerative.
11	Aquilaria agallocha (Aguru, Akil)	Thymelaeaceae	Aquilarone derivatives, 10-Epi-γ-eudesmol, Jjinkohol, Phenylethyl chromones, Vanillic acid, Kusunol.	Antimicrobial, Anti-inflammatory, Carminative, Antiasthmatic, Analgesic.

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12	Bambusaarundinacea (Vanshalochana)	Poaceae	Benzoic acid, DiferuloylArabinoxylanhexasaccharide, Resins, Taxiphyllin, Oxalic acid, Oligosaccharide, Waxes.	Aphrodisiac, Antiulcer, Astringent, Emmenagogue, Stimulant
13	Boerhaviadiffusa (Punarnawa, Gadahapuran, Gadahbindo)	Nyctaginaceae	Glycosides, Triterpenoids, Alkaloids, Steroids, Flavonoids, Rotenoids	Antioxidant, Hematinic, Antipyretic, Anti-inflammatory, Antiaging
14	Cinnamomum tamala (Tejpat, Tejpatra)	Lauraceae	Jeolikote, Camphor, Eugenol, (E)-Cinnamaldehyde, o-Cymene, p-Cymene, Linalool, (E)-Cinnamyl acetate, (E)-Innamaldehyde, Essential oil, 1,8-Cineole	Immunomodulatory[27],Anticancer, Antiulcer, Digestive, Antidepressant, Stimulant, Hepatoprotective, Antimicrobial
15	Cinnamomum zeylanicum (Dalchini)	Lauraceae	(E)-Cinnamaldehyde, , Caryophyllene oxide, Eugenol, δ-cadinene, Globulol, Linalool, α-Copaene, α -Terpineol, (E)-Cinnamyl acetate, Viridiflorene, (E)-Caryophyllene, α-Humulene, Tetradecanal and α-Bergamotene, Tetradecanol, β-Caryophyllene, (E)-Cinnamyl acetate, α-Cadinol	Immunomodulatory28, Appetizer, Gastroprotective, Hepatoprotective, Antinociceptive, Hematinic, Digestive
16	Curcuma zedoaria (Kachur, Ban haldi, narkachur)	Zingiberaceae	γ-Elemene, 6-Ethenyl-4,5,6,7-tetrahydro-3,6-dimethyl-5-isopropenyl-trans-benzofuran, Eucalyptol, 8,9-Dehydro9-formyl-cycloisolongifolene	Immunomodulatory ,Stimulant, Dyspepsia, Antidiarrheal, useful in Flatulence, Tonic
17	Cyperusrotundus (Musta, Mustak, Nagarmotha)	Cyperaceae	Azulene, Vatirenene, Zierone, Fokienol, Selinene, Cyperene, Calacorene, Isoginkgetin, Longiverbenone, Pinene, Amentoflavone, Humulen, Isogermacrene D, Campholenic Aldehyde, Limonene, Myrtenol, Ginkgetin,Sciadopitysin, Copaene,Terpineol, Isolongifolene	Antirheumatic, Diuretic, Emmenagogue, Hepatoprotective, Carminative, Stomachic, Stimulant, Antispasmodic, Anti-inflammatory
18	Desmodiumgangetium (Shalparni, Sarivan)	Fabaceae	Hordenine, Desmodin, Caudicine, Gangetin-3H, Hypaphorine, Gangetinin, N-dimenthyltryltryptamine	Fatigue, Respiratory disorders, Cardiovascular, General debility, Neuroprotective

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19	Elettariacardamomum (Elaichi, Cardamom)	Zingiberaceae	Sabinene, 4-Terpinen-4-ol, α-Terpinyl acetate, Myrcene, 1,8-Cineole	Immunomodulatory[34],Appetizer, Intestinal spasms, Stimulant, useful in Nausea, Tonic, Heartburn, Stomachic
20	Gmelina arborea (Gambhari, Gamhar, Kashmarya)	Lamiaceae	Hexanol, Pentacosane, 1-Octen-3-ol, 1-Pentacosene, (E)-2-Decenal, (Z)-3-Hexenol, Heptacosane, Nonanal	Lactation, Strength and virility Promoter
21	Inula racemose (Pushkarmul)	Asteraceae	Humulane, Germacranolide, Heptadeca-1,8,11,14-tetraene, Elemanolide, Guainolide, Eudesmanolide, Sesquicaranolide	Cure Cough, Flank pain, Bronchodilator, Cure Asthma, Antihistaminic, Cure Cold
22	Leptadenia reticulata (Jivanti)	Apocynaceae	Reticulin, Hentriacontanol, Lupanol 3-O-Diglucoside, Ferulic acid, β-Sitosterol, Leptidine, Diosmetin, Stigmasterol, α-Amyrin, Apigenin, Luteolin, Leptaculatin, Rutin, Liosmtin, β-Amyrin, Simiarenol, Deniculatin	Immunomodulatory[38], Aphrodisiac, Restorative, Anticancer, improves Vision, Stimulant, Nnutrient, improves Life expectancy
23	Martyniadiandra (Ulatkanta)	Martyniaceae	Arachidic acid, Apigenin-7-o-glucuronide, Gentisic acid, Cyanidin-3- Galactoside, Linoleic acid, Apigenin, p-Hydroxy benzoic acid, Palmitic acid, Pelargonidin-3-5-diglucoside, Stearic acid	Laxative, Constipation, in treatment of Indigestion, Hepatotonic, Anorexia, Cholagogue
24	Mesua ferrea (Nagakesar)	Calophyllaceae	Caloxanthone C, Mesuaferrin B, Tovopyrifolin C, Macluraxanthone, 1,Mesuaferrin C, 5-Dihydroxyxanthone and Mesuaferrin A	Carminative, Swelling relieving, Cardiotonic, relieves Urinary tract disordersAntitoxic, Digestive, , Gout relieving
25	Nelumbiumspeciosum (Sahasrapatra, Neelkamal)	Nelumbonaceae	Methylcoclaurine, Dehydroanonaine, (+)-1(R)-Coclaurine, Lirinidine, Roemerin, Hyperin, Kaempferol, Isoliensinine, Liriodenine, Demethylcocaluerine, N Dehydroemerine, derivatives of Kaempferol, Armepavine, Linalool, Quercetin-3-O-β-D-glucuronide, β-Sitosterol, Asimilobine, Neferine, Dehydronuciferine, Anonaine, Rutin, Isoquercitrin, (−)-1(S)-norcoclaurine, N-Methylasimilobine, Nuciferine,	Relieves Hemoptysis, Cardiotonic, Relieves Menorrhagia, promotes Strength and Relieves Hematuria, Calming, Nourishing, Relieves Epistaxis

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			N-Norarmepavine, Luteolin glucoside, Nornuciferine Quercetin, Liensinine, N-Methylisococlaurine	
26	Oroxylum indicum (Aralu, bhut-vriksha, Shyonak)	Bignoniaceae	Scutellarein-7-o-glucopyranoside, Pinobanksin, Oroxoloside methyl ester, Baicalein-7-odiglucoside, Echinulin, Ellagic acid, 8, 8' Bis-baicalein, Scuttellarien, Pinocembrin, Oroxylin a, Chrysin-7-ogentiobioside, Biochanin a, Adenosine, Chrysin, Chrysin-6-c-β-D-glucopyranosyl-8- c-α-l arabinopyranoside, Dimethyl sulfone, Ursolic acid, 6–Hydroxy luteolin, 2α-Hydroxyl lupeol, Aequinetin, Baicalein, β-Sitosterol, Lupeol	Immunomodulatory ,Hepatoprotective, Antimicrobial, Nephroprotective, Cardiotonic In treatment of general Weakness
27	Phaseolus trilobus (Mudagparni)	Fabaceae	Kievitone, Carvone, Dalbergioidin, Quercetin, Isovitexin, Phaseollidin, Pulgeone, Kaempferol, Vitexin, α-Pinene	Antioxidant, Improves Semen quantity, Aphrodisiac, promote Strength, Tonic, Improves Sperm quantity, mild Sedative
28	Phyllanthus niruri (Bhumyamalaki, Bhumi-awala)	Phyllanthaceae	Elligitannin, Niranthin, p-Cymene, Quercitrin, Quercetin, Nruriflavone, Limonene, Hypophyllanthin, Gallic acid, Phyltetralin, Quercetol, Nirtetralin, Hexahydroxyldiphenoyl moiety, Ellagic acid, Phyllanthin, Gallocatechin, Lupeol, Astragalin, Nirurin, Lintetralin, Isolintetralin, Rutin, Methyl brevifolincarboxylate	Antiviral, Antioxidant, Cholagogue, Laxative, Hepatoprotective, Anticancer
29	Pistacia integerrima (Kakdasingi)	Anacardiaceae	Hydroxydecanylarachidate, Terpinen-4-ol, α-Pinene, Octadecan-9, 11-diol-7-one, Sabinene, Pisticialanstenoic acid, Limonene, Pistacienoic acids, β-Sitosterol, β-Pinene, α-Terpinol	Antitussive, Cholagogue, Expectorant, Bronchodilator, Digestive, Carminative
30	Premnailltegrifolia (Arni, Agnimanth)	Lamiaceae	Premnazole, β-Sitosterol, Betulin, Clerodendrin-A, Premnine, Linoleic acid, Ganiarine, Caryophellen, Linalool, Premnenol, Luteolin, Aphelandrine, Iridoid glycoside, p-Methoxy cinnamic acid, Ganikarine,	Digestive, Antitussive, Laxative

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			PremnaSpirodiene	
31	Pterocarpus santalinus (Raktachandan)	Fabaceae	Xanthones, α Resorcylic acid, Lupeol, Phenylacetic acid, Eudesmol, Isopterocarpalone, Gentisic acid, Cinnamic acid, Benzophenones, Santalin B, Epicatechin, Sesquiterpenes, Pterocarptriol, Lignans, Santalin Y, Acetophenones, β-Cryptomeridiol, Coumarins, β-Sitosterol, 3-Hydroxybenzoic acid, Santalin A, Vanillic acid, Pterocarpodiolones, Lignans, Pterostilbenes, β Resorcylic acid	Aphrodisiac, Protective and Antimicrobial effect on Genitourinary, Antipyretic, Diaphoretic, Anticancer, Protective and Antimicrobial effect on Bronchial tract mucosa, Tonic, Anti-hyperglycemic
32	Sesamum indicum (Tiltaila, Sesame oil)	Pedaliaceae	(-)-Asarinin, (+)-Pinoresinol, (+)-Sesamolin, (+)-Sesamin, (-)-Piperitol, Sesamol, (+)-(8R, 80R, 7S)-Acuminatolide, (+)-Samin	Demulcent, Aphrodisiac, Nutritive, Antioxidant[49], Anti-inflammatory, Radioprotective Wound healing.
33	Solanum indicum (Brihati, Barikateri, Vanbhanta)	Solanaceae	Diosgenin, Indicumine B, 7-Hydroxy-6,8-Dimethoxy-3-(40-Hydroxy-30-Methoxyphenyl)-Coumarin, Indioside B, Solamargine, Cleosandrin, Trilinolein, Daucosterol, Isoanguivine, Indicumine C, Protodioscin, Solavetivone, Solasodine, Indioside C, N-Trans-Feruloyltyramine, Solafuranone, Indioside F, Fraxetin, N-p-trans-Coumaroyltyramine, Arteminorin, Indioside D, β-Sitosterol, Solanidine, Indicumine A, Lanosterol, Indioside A, Isofraxidin, Indicumine D, Oleodilinolin, 4, 4'-biisofraxidin, Scopoletin, Carpesterol, Indicumine F, Palmitodilinolin	Carminative, Astringent, Digestive, Cardiotonic
34	Solanum xanthocarpum (Kantakaari, Chotikateri)	Solanaceae	Campesterol, Ursolic acid, Withanolide B, oleanolic acid, β-Sitosterol, Lupeol, Ergosterol	Bronchodilator, relieves Flu, Anti-allergic, Expectorant, Mucolytic

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35	Stereospermumsuaveolens (Paatla)	Bignoniaceae	Sterolensin, Lapachol, Apigenin, Sterochenol B, Scutellarein, Sterochenol A, Dinatin-7-glucuroniside, Sterekunthal B, Dinatin, Dehdro-a-Lapachone	Digestive, Blood purifier, Cardiotonic, Antianemic, Tonic, Anti-inflammatory
36	Teramnus labialis (Mashaparni)	Leguminosae	Daidzin, Bergenin, 3-O-methyl-D-chiro–inositol, Vitexin	relieves Debility, Aphrodisiac, Improves Virility, relieves Fatigue, Improves Vigor
37	Terminalia chebula (Harad, Haritaki)	Combretaceae	Chebulinic acid, Punicalagin, 2,4-Chebulyl-D-glucopyranose, Terchebin, Arjungenin, Ellagic acid, Terflavin A, Luteolin, Arjunglucoside I, Ethyl gallate, Tannic acid, Chebulin, Gallic acid	Immunomodulatory[55], Carminative, Appetite stimulant, Rejuvenative, Nervine tonic, Neurotrophic, Anthelmintic
38	Urariapicta (Prishnaparni, Pithawan)	Fabaceae	Isoflavanones, 5, 7-Dihydroxy-2'-methoxy-3', 4'-methylenedioxyisofla-vanone, Triterpenes4', 5'-Dihydroxy-2', 3'-dimethoxy-7-(5-hydroxychromen-7yl)-isoflavan-one, Steroids	Cardiovascular disorders, Nervine tonic, General weakness
39	Vitis vinifera (Draaksha, Munnakka)	Vitaceae	Catechin, Peonidin-3-O-glucoside, E-ε-Viniferin, Stilbenoid, p-Coumaric acid, Malvidin-3-O-glucoside, Anthocyanidin-3-O-glucosides, Betulinic acids, 1,2-di-O-acyl-3-O-β-D-galactopyranosylglycerols, (-)-Epicatechin, Gallic acid, E-Resveratrol, Caffeic acid, Gallocatechin, Cyanidin-3-O-glucoside, Oleanolic, Daucosterol, 6′-O-Acyldaucosterols, Ferulic acid	Immunomodulatory[58], Cardiotonic, cure Thirst, Demulcent, Nutritive, Diuretic, Laxative, cure Asthma, Aphrodisiac, Hepatoprotective
40	Ghee of Indian cattle Zebu (Go-ghrita of sahiwal)	Bovidae	Vitamins A, Conjugated linoleic acid, Beta carotene, Vitamins D, Antioxidants, Vitamins K, Monounsaturated fats, Vitamins E	Improves overall Physical strength, Antioxidant, Immunomodulatory, Anticancer, Improves overall Mental strength, Nutritive
41	Honey from hive of Apiscarnea (Madhu)	Apidae	Naringenin, Caffeic acids, Oligosaccharides, Pinostrobin, Diastase, Protocatechuic acid, Minerals/Trace elements, Transcinnamic acid, Catechin, Apigenin, Fructose, Syringic acid, Carotenoids, Cholines, Kaempferol, Kynurenic acid,	Relieves Cold, Wound healing, Immunomodulator, Antioxidant, relieves Cough Anti-infective, relieves Sore throat, Antiaging, Antiseptic, Antiulcer

Ilkogretim Online - Elementary Education Online, 2020; Vol 19 (Issue 3): pp.3079-3099
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			Glucose oxidase, Benzoic acid, Luteolin, Invertase, p-Coumaric acid, Catalase peroxidase, Gallic acid, Phosphatase	
42	Dioscoreabulbifera (Varahikand, Varahi)	Dioscoreaceae	β-Sitosterol, 8-Epidiosbulbin E acetate, Vanillic acid, Diosbulbisin A-D, Diosbulbin A-P, Neoxanthin, Sinodiosgenin, Bafoudiosbulbin A-G, Diosbulbisides A-C, Catechin, Diosgenin, Isovanillic acid Dioscoreanoside A-K, Quercetin-3-O-β-D-Glucopyranoside, Glycoside derivatives	promotes Strength, Tonic, Aphrodisiac, promotes Vigor, Antiulcer
43	Ipomoea digitata (Vidaarikand)	Convolvulaceae	N-Butyl-β-Dfructopyranoside, Umbelliferone, Scopoletin, Octadecyl (E)-p-coumarate, Scopolin, Taraxerol acetate, Taraxerol, Scoparone	Relieves Debility, Antioxidant, Spermatorrhea, Galactogogue, Aphrodisiac, Nervine tonic
44	Eugenia caryophyllus (Loung, Clove)	Myrtaceae	Seugenin, Crategolic acid, Bicornin, Sesquiterpenes, β-Caryophyllene, Oleanolic acid, Rhamnetin, Methyl salicylate, Eugenitin, Triterpenoids, Stigmasterol, Vanillin, Gallotannic acid, Acetyl eugenol, Kaempferol, Campesterol	Aromatic, Anti-inflammatory, Antimicrobial, Stimulant, Antiseptic

PHARMACOLOGICAL POTENTIAL OF PLANT SPECIES PRESENT IN CHAYAWANPRASH:

1) Withaniasomnifera:
Davis L. et al., (2005) observed that the immunostimulant outcome from the concentrated preparation of powdered root of plant Withaniasomnifera. In this about 5 prescription of extract were administered (20mg/dose/animal; i.p.) and it enhanced the total number of WBC cells (17125 cells/mm^3) on 10^{th}day and it increases the cellularity of Bone marrow ($27x10^6$ cells/femur) and is also responsible for enhancement of cell-count of alpha-esterase positive cells (1800/4000 cells). In the peritoneal macrophages the phagocytic action was found to be higher and inhibition of delayed type hypersensitivity was also observed in mice after the administration of Withaniasomnifera(Davis et al.2000) .

2) Tinosporacardifolia:
Dahanukar S.A. et al., (1997) studied the immunomodulatory effect of Tinosporacardifolia (guduchi) and purified an immunomodulatory protein (ImP) from the powder extract of dried stem. Its depiction was done and also performed the Assay and it showed the lymphoproliferative and macrophage-activating properties (Dhanukaretal. 1997) (Ismail et al. 2017).

3) Piper longum:
Sunila E.S. et al., (2004) studied that alcoholic concentrated preparation from the fruit of Piper longum construct cytotoxicity of L929 cells within the culture at a level of 100 µg/ml. Extract also increased number of White Blood Cells upto142.8 in Balb/c mice (Sunila et al. 2004) (Ying et al. 2018).

4) Bacopa monnieri:

In a recent studied that labeorohita was feeded with Bacopa monnieri and it was observed that stress tolerance was enhanced. Superoxide dismutase activity values were in between 1.323-2.289 (Vishal et al. 2020) (Govindum et al. 2003).

5) Asparagus racemosus:
Bapana N. et al., (2007) studied that Aqueous extract of Asparagus racemosus was used in HA titer test and it was observed that retarded mortality and improved health status in animals (Bapana et al. 2007) (Huo et al. 2008).

6) Emblica officinalis:
Singh M.K. et al., (2013) observed the immune-stimulant activity of Embelica officinalis. Inside his study, exposure of mice was done either to arsenic or amla or at the same time for 28 days with arsenic and amla. Through studies done inside the body and outside the body, it was observed that the amla shows antioxidant potential in arsenic induced oxidative stress and apoptosis (Singh et al. 2013) (Paudel et al. 2015).

7) Tribulus terrestris:
In a recent studied that the saponins was isolated from Tribulus terrestris and in vitro phagocytosis by murine peritoneal macrophages was performed on rats and it was observed that different dose fraction show increase in phagocytic activity (Vishal et al. 2020) (Kuo et al. 2011).

8) Adhatodavasica:
In a recent it was that the immunomodulatory effect of Adhatodavasica was obtained when an oral dose of concentrated preparation of 400 miligram/kilogram were tested over the young adult male, there would be enhanced report of percentage of adhesion of neutrophil to nylon fibres ($P<0.001$) (Maheshwari et al. 2021) (Preet et al. 2018).

9) Aegle marmelos:
Govinda H.V. et al., (2011) studied that concentrated preparation in methanol of Aegle marmelos increases cellular and humoral immunity. It was observed that there is an increase in adhesion of neutrophils. There is increased in phagocytic index in carbon clearance assay. Increased antibody was also observed in indirect haemagglunation test (Govinda et al. 2011).

10) Cinnamomum tamala:
Chaurasia J.K. et al., (2010) studied that when oral route of administration was used for hexane fraction of Cinnamomum tamala in rats for 10 days and shows inhibitory delayed type of hypersensitivity (DTH). Furthermore 30 days treatment was given and it was found that change in body weight, spleen weight ,thymus weight were observed (Chaurasia et al. 2010).

11) Cinnamomum zeylanicum:
In a research it was studied that concentrated preparation of Cinnamomum zeylanicum root was orally administered at 10 and 100 mg/kg dose. It was observed that increase in serum immunoglobulins levels and decreased pasteruellamultocida –induced mortality by 17% (Vishal et al. 2020) (Rahman et al. 2007).

12) Curcuma zedoaria:
In a recent study it was stated that polysaccharide fraction of Curcuma zedoria was administered in swiss Webster mice over dose of 300miligram/kilogram. The phagocytic index comes to be 1.34 and enhancement of humoral immune response shown by primary and secondary antibody titers (1:128 and 1:4096). Splenocyte proliferation was found to be 10-6 to 1mg/ml ($P<001$) at dose of 300 mg/kg (Kunal et al. 2021).

13) Elettaria cardamomum:
Majdalawieh A.F. et al., (2010) observed that Elettaria cardamomum shows enhance splenocytes proliferation through synergistic manner and in a manner dependent over dose. Elettaria cardamomum also shows significant enhancement in the cytotoxic activity and natural killer cells (Majdalwieh et al.2010) (Masoumi et al. 2016).

Ilkogretim Online - Elementary Education Online, 2020; Vol 19 (Issue 3): pp.3079-3099
http://ilkogretim-online.org
doi: 10.17051/ilkonline.2020.03.735474

14) Leptadeniareticulate:
Pravansha S. et al., (2012) observed that Leptadenia reticulate shows a significant dose-dependent antibody titre values increment. It also shows phagocytosis in carbon clearance assay. It increases hematalogical profile, CAT, SOD, GSH activity (Parvansha et al. 2012).

15) Oroxylum indicum:
A study was conducted and it was observed that the n-butanol fraction of root and a bark of Oroxylumindicum show a notable increase in circulating HA titer and rise in paw edema formation which shows increase in host DTH response. It was also observed that reduction in malondialdehyde, catalase, and glutathione (Vishal et al. 2020).

16) Triphla (Terminalia bellerica, Terminalia chebula and Emblica officinalis):
Belapurkar P. et al., (2014) observed that triphla is made up of 3 constituents Terminalia bellerica, Terminalia chebula and Emblica officinalis. Extract obtain from triphla shows stimulation to neutrophil function, it increases IL-4 levels and IL-2, IFN-γ levels also. The aqueous extract of triphla enhance the macrophage activation due to their free radical scavenging activity(Belapukar et al. 2014).

17) Vitis vinifera:
Tong H. et al., (2011) studied that proantocyanidins were isolated from Vitis vinifera and these shows an increased weight of spleen & thymus of Sarcoma 180- bearing mice & extent of tumor necrosis factor-α (TNF-α) is also increased (Tong et al. 2011) (Nassiri et al. 2010).

2) SANJIVANI VATI:
It is a herbal formulation which contains herbal species such as Embelicaribes, Zingiber officinale Rosc., Piper longum Linn, Terminalia chebulaRetz etc. which have activity such as antioxidant, anticancer, antiinflamatory, etc.and helpful in disorders such as bronchitis, jaundice, infertility etc.The natural ingredients in Sanjivanivati with their major biomolecules and pharmacological effects are listed in Table 2.

Table 2: Herbal composition of Sanjivanivati with their major active biomolecules' constituents and pharmacological effects

S. No	Medicinal Plants/Special Additives	Family	Major Active Biomolecules	Pharmacological Activity
1	Embeliaribes (Vidanga)	Primulaceae	Embelin, Embolic acid, Rapanone, Sitosterol, Daucosterol,Embelinol, Embelyaribyl ester, Embeliol,Vilangin,Christenbine.	Antioxidant, Anti-inflammatory, Contraceptive, Antibacterial, Anti-fertility, Mental disorders, Anti-tumour, Bronchitis, Jaundice, Anti-helminthic, Diabetes,Cardioprotective, Analgesic, Anti-inflammatory,Influenza epidemic,Antibiotic and Anti-tuberculosis, Skin diseases and leprosy.
2	Zingiber officinale	Zingiberaceae	Zingerone, Shogaols, Gingerols, EnzymeZingibain, Cysteine	Immuno-stimulatory,

Ilkogretim Online - Elementary Education Online, 2020; Vol 19 (Issue 3): pp.3079-3099
http://ilkogretim-online.org
doi: 10.17051/ilkonline.2020.03.735474

	(Sunthi)		Protease.	Antioxidant, Antiviral, Anti-inflammatory, Analgesic, Anti-tussive.
3	Piper longum (Pippali)	Piperaceae	Derivatives of Pyridine, Phenol ethers, Cinnamic acid, Pteridines, derivatives of steroids, Napthalenes, derivatives of caboxylic acid, Phenanthrenes, Steroids, Carboxylic acids, Phenylpropanoic acids, Oxanes, Isoflavonoids, Pyridines, derivatives of Phenanthrenes, derivatives of Cinnamic acid, derivatives of Pteridine	Immunomodulatory,Anti-inflammatory, Anti-diabetic, Anti- apoptosis, Anti arthritic, Antioxidant, Antimicrobial, Anti-infertility, Antitumour, Anti-stress, Hepato-protective.
4	Terminalia chebula (Haritaki)	Combretaceae	Terchebin, Ethyl gallate, Arjunglucoside I, Punicalagin, Chebulinic acid, Luteolin, Chebulin, 2,4-Chebulyl-D-glucopyranose, Terflavin A, Gallic acid, Arjungenin, Ellagic acid, Tannic acid.	Immunomodulatory, Wound healing activity, Anti-amoebic, Antiviral,Radio-protective, Anti-arthritic, Anti-carcinogenic, Anthelmintic, Antioxidant, Antifungal, Antibacterial, Anti-diabetic, Antimutagenic, Anti-plasmodial, Retino-protective.
5	Emblica officinalis (Amalaki)	Phyllanthaceae	Ascorbic acid, Trigallayl glucose, Aspartic acid, Quercetin, Chebulagic acid, Gallic acid, Emblicanin A&B, Geraniin, Methyl gallate, Ellagic acid, Cystine, Pedunculagin, Phyllantidine, Proline, Chebulinic acid, Phyllembein, Pectin, Phyllantine, Kaempferol, Lysine, Citric acid, Glutamic acid, Punigluconin, Corilagin, Ellagotannin, Alanine.	Immunity enhancer, Atherosclerosis, Diabetes, Diarrhoea, High blood pressure, Obesity, High cholesterol, Joint pain, Cancer, hypertension, Influenza, chronic cold and cough, AIDS, chronic fatigue, antioxidant, hair loss, anti ageing, inflammatory conditions.
6	Terminalia bellirica (Vibhitaki)	Combretaceae	Mannitol, Ethyl gallate, Ellagic acid, Resins, 7- Hydroxy 3'4' (Methylenedioxy) flavones, Chebulagic acid, Gallo-tannic acid, Glucose, a greenish yellow	Immuno-modulatory, Hepato-protective, Anti-diarrheal,

Ilkogretim Online - Elementary Education Online, 2020; Vol 19 (Issue 3): pp.3079-3099
http://ilkogretim-online.org
doi: 10.17051/ilkonline.2020.03.735474

			Oil, AnolignanB, Gallic acid, Fructose, β-Sitosterol, Glucoside (Bellericanin), Lignans (Thannilignan and Termilignan), Rhamnose, Galloyl glucose, Coloring matter, Tannins, Phyllemblin	Antihypertensive, Antiulcer, Antispasmodic, Antioxidant, Analgesic, Antimicrobial, Wound healing, Bronchodilator, Anticancer
7	Tinosporacardifolia (Guduchi)	Menispermaceae	Choline, Columbin, Cordifolide, Tinosporide, Diterpenoid furano lactone, Palmatine, Tinosporine, Cordifol, b-Sitosterol, Heptacosanol, Tinosporidine, Tembertarine, Magniflorine, Tinosporaside, Clerodane Furano diterpene, Berberine, Tinosporin	Immunomodulatory,Cytoprotective, Antibacterial, Anti-inflammatory, Anticonvulsant, Antidiabetic, Antihepatotoxic, Anti mutagenic, Antiulcer, Hypolipidemic, Antispasmodic, Insecticidal, Antioxidant, Antidiarrheal, Anti cancer, Antifungal, Antitumour, Bronchiodilatory
8	Semicarpous anacardium (Bhallataka)	Anacardiaceae	O-Tetramethylbiflavanone A1, Anacardic acid, Phenolics, Bhilawanol-B, Anacardoside, Bhilwanols, Phenolic compounds, Biflavonoids, O-Dimethylbiflavanone B, Jeediflavanone, Sterols and Glycosides, cis- and trans isomers of Ursuhenol, O-Heptamethylbichalcone B1, di-Olefin II, Amentoflavone, Galluflavanone, O-Trimethylbiflavanone A1[21], Bhilawanol-A, O-Trimethyl biflavanone A2, Semecarpuflavanone, Anacarduflavone mono-Olefin I, Nallaflavanone, O-Hexamethylbichalcone B2, Tetrahydrobustaflavone, O-Tetramethylbiflavanone C, Semecarpetin, Tetrahydro amentoflavone semicarpol, O-Hexamethylbichalcone A	Immunomodulatory,Anti Hyperglycaemic, Hypolipidaemic, Anti diabetic, Antiulcer, Hepatoprotective, Anti inflammatory, Cognition stimulatory (learning and memory), Anti oxidant, Antimicrobial, Anti cancer/ Anti tumor, Antistress.
9	Acorus calamus (Vacha)	Acoraceae	2,5- Dimethoxybenzoquinone, Isohyobunones, α-Calacorene, β-Cadinene, p-Cymene, Galagin, pre-Isocalamendiol, 2-Deca-4,7-	Immunomodulatory, Anti Hyperglycaemic, Hypolipidaemic,

Ilkogretim Online - Elementary Education Online, 2020; Vol 19 (Issue 3): pp.3079-3099
http://ilkogretim-online.org
doi: 10.17051/ilkonline.2020.03.735474

			dienol, cis-Isoelemicine, 2,4,5-Trimethoxy benzaldehyde, Calamendiol, Calamusenone, Methyl ethers of Trans-Isoeugenol, Camphor, β-Gurjunene, Acorenone, cis-Isoeugenol, Spathulenol, Methyl ethers of cis-Isoeugenol, Terpinen-4-ol, Acorone, α-Asarone, Linalool, Shyobunones, Trans-Isoeugenol, Acoragermacrone, α-Selinene, Sitosterol, α-Terpineol, Elemicine, Camphene, Acoradin.	Anti diabetic, Antiulcer, Hepatoprotective, Anti inflammatory, Cognition stimulatory (learning and memory), Anti oxidant, Antimicrobial, Anti cancer/ Anti tumor, Antistress.
10	Aconitum ferox (Vatsanabha)	Ranunculaceae	Aconitine, Pseudoaconitine, Chasmaconitine, Indaconitine, Hypoaconitine, Mesoaconitine.	Immuno-modulatory, Analgesic, Anti-inflammatory, Antipyretic, Hypoglycaemic.
11	Urine of Zebu cattle (sahiwal)	Bovidae	Creatinine, Calcium salts, Manganese, Minerals, Citric, Vitamin D, Hormones, Lactose, Nitrogen, Phosphate, Silicon, Vitamin C, Magnesium, Vitamin E, Sodium, Chlorine, Succinic, Vitamin A, Carbolic acid, Vitamin B, Iron, Sulphur, Enzymes.	Hepatic system protective, Antifungal, Immuno-modulatory, Bio-enhancing, Antioxidant, Anti-diabetic, Anticancer, Antibacterial, Anti-clastogenic, Wound healing.

PHARMACOLOGICAL EFFECT OF PLANT SPECIES COUNTED IN SANJIVANI VATI:

1) Zingiber officinale:
Martina H. et al., (2015) stated that immunomodulatory activity was shown by Zingiber officinale.Blocking oxidation processes inside cells of yeast was done by notable enhancement of antioxidant marker enzymes (via dose-dependent manner), glutathione peroxidase (GPx), catalase (CAT) and superoxide dismutase (SOD) in the in-vivo studies in Saccharomycescerevisiae (Hofrel et al. 2015).

2) Semecarpus anacardium:
Singh D.et al., (2006) observed that Semicarpous anacardium extract inhibits LPS induced & automatic generation of cytokines such as Interleukin -1 beta and Interleukin -12p40 at protein and mRNA level. In macrophage cell line concentrated preparation even supposed the LPS activated nitric oxide generation in the mouse (Singh et al. 2006).

3) REVITAL-H:
Revital-H is a formulation which contains Panax pseudoginseng. It contains Vitamins such as A, B (B_1, B_3, B_6, B_{12}), C, D, E and also Folic acid. There are various ions such as Potassium, Calcium, Magnesium, Zinc, Phosphorus, Mangnese, Iodine and Copper. It fulfils ionic and vitamins requirements of human body and help to increase body activeness[99]. Plant species contained in Revital-H and their major active biomolecules alongwith pharmacological effects are liste in Table 3.

Table 3: Plant species present in Revital-H with their major active Biomolecules constituents and Pharmacological effects

Ilkogretim Online - Elementary Education Online, 2020; Vol 19 (Issue 3): pp.3079-3099
http://ilkogretim-online.org
doi: 10.17051/ilkonline.2020.03.735474

S. No.	Medicinal Plants/Special Additives	Family	Major Active Biomolecules	Pharmacological Activity
1	Panax pseudoginseng (Himalyan Ginseng)	Araliaceae	Saponin glycosides, Ginsenoside, Chikusetsusaponin, Panxoside, Ginsenosides, Panaxadiol, Aglycone Dammarol, Oleanolic acid, Starch, Gum, Resins, Volatile oil.	Immunomodulatory (humoral and cellular-dependent), Anticarcinogenic, Antidiabetic, Cognition modulatory (Learning and Memory), Anti-neurodegenerative.

PHARMACOLOGICAL EFFECT OF POTENTIAL HERBAL SPECIES OF REVITAL-H:

1) Panax pseudoginseng:
Lee D.C.et al., (2009) observed that the immunomodulatory activity of the Panax pseudoginseng. Ginseng & its active constituents (ginsenosides) are beneficial in many human diseases. It is hypothesized (as actual mechanism is unknown) that pharmacological activity of ginseng are the result of its anti inflammatory effects. Transcription and Secretion of CXCL-10 and TNF-alpha stimulation is inhibited by 70% ethanolic water extract of ginseng. Using HPLC nine ginsenosides Rg1, Rc, Rf, Rb1, Rd, Rb2, Rg3, Rh1 and Re were found and seven from them shows the activity of inhibition of TNF-alpha induced CXCL-10 expression in U937 cell (Lee et al. 2009).

4) ASHWAGANDHA POWDER:
Withaniasomnifera Duna is also reffered as Ashwagandha or White chicory. It is an important herbal species of Traditional Indian Medicine System. It has Immunomodulatory, Antibacterial, Antimicrobial, Antistress effect etc. It also promoted the growth of body. Ashwagandha is used from ancient time to till now to treat various disorders (Table 4).

Table 4: Plant species of Ashwagandha Powder with their major active Biomolecules constituents and Pharmacological effects

S. No.	Medicinal Plants/Special Additives	Family	Major Active Biomolecules	Pharmacological Activity
1	Withaniasomnifera (Ashwagandha)	Solanaceae	Withasomnine, Somnine, Pseudotropine, Withaferin A, Anaferine, Withanine, Withananine, Cuscohygrine, Chlorogenic acid, Isopelletierine, Somniferinine, Tropine, Pseudo-withanine, Withananinine, Anahygrine, Somniferine, Visamine	Immunomodulator, Analgesic, Antistress, Rejuvenating, Adjuvant to chemotherapy, Cardiovascular protection, Hypo glycemic and Hypo cholesterolemic, Growth-promoting, Anti-arthritic, Rasayana, Adaptogenic

5) SHILAJIT:
Shilajit the black-brown exudation found in mountains through the rock's layer. It is also called salajit, shilajatu, mumie or mummiyo. Its physiological properties may vary from region to region. It is a principal herbal species in Ayurveda, Siddha and Unani due to its medicinal property. It includes activity such as antioxidant, hearing augmentation, memory enhancement and anxiolytic etc (Agarwal et al. 2007).

Table 5: Herbal species of Shilajit with their major active Biomolecules constituents and Pharmacological effects

Ilkogretim Online - Elementary Education Online, 2020; Vol 19 (Issue 3): pp.3079-3099
http://ilkogretim-online.org
doi: 10.17051/ilkonline.2020.03.735474

S. No.	Medicinal Plants/Special Additives	Family	Major Active Biomolecules	Pharmacological Activity
1	Exudation from Steep rocks of Mountain (Shilajit)	Anacardiaceae	Aromatic carboxylic acid, Ichthyol, Benzoic acid, Dibenzoalpha-pyrones, Waxy materials, Humic and Fulvic acids, 3,4-Benzocoumarins, Gums, Vegetable matter, Resins, Ellagic acid, Triterpenes, Fatty acids, Phenolic lipids, Hippuric acid, Albuminoids, Sterol, Amino acids.	Immunomodulatory, Antiulcerogenic, anti-inflammatory, Antioxidant, Learning augmentation, Antidiabetic, Memory enhancement, anxiolytic, Antistress, Anti-HIV.

PHARMACOLOGICAL EFFECT OF POTENTIAL HERBAL SPECIES OF SHILAJIT:

1) Shilajit:
Agarwal S.P. et al., (2007) observed that Immunomodulatory activity of shilajit was studied in mice. In the experiment, WBCs performance was examined after giving the extract of shilajit to mice. The activation of murine peritoneal macrophages & splenocytes of tumor bearing animals in the beginning and end phase of tumor growth after giving the extract of shilajit to mice was observed (Agarwal et al. 2007).
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6) BRAHMI TABLETS:
Brahmi tablet is an ayurvedic and herbal formulation which is mainly used as brain tonic. It increases cognitive functions and act as memory enhancer.It also enhanceImmunity and helps peoples to fight against viral and bacterial infections.

7) SAFED MUSLI POWDER:
Chlorophytum borivilianum is an Ayurvedic herb some time reffered as White Gold. It is used as fertility tonic which nourishes the Mind, Nervous and Reproductive system. It is also considered as a herbal Viagra which increases the Strength and Stamina and also increases the Immunity. It improves sperm count and also supports erection (Vishal et al. 2020).

PHARMACOLOGICAL EFFECT OF POTENTIAL HERBAL SPECIES OF SAFED MUSLI:

1) Chlorophytum borivilianum:
It was observed that immunomodulatory activity of C. borivilianum by administering the concentrated preparation in ethanol from tuber of Chlorophytum borivilianum and effect of azathioprine induced myelosuppresion was also determined. Delayed type hypersensitivity response and survival rate against the Candia albicans infection were improved after the administration of extract (Vishal et al. 2020).

8) AMALAKI CAPSULES:
In Ayurveda which is an Indian traditional medicine system amalaki used to treat diabetes, diarrhoea, high cholesterol, joint pain etc. It is a rich source of vitamin-C, Iron, essential aminoacids, antioxidantsand minerals.

9) ALOEVERA GEL:
Aloe-vera is a herbal plant species commonly known as Ghrit kumara. It is used in various cosmetics preparations. It has laxative, anti-tumour, antioxidant effect etc.It contains 90% rhodium and iridium which is responsible for immuno-modulating effect of it.

PHARMACOLOGICAL EFFECT OF POTENTIAL HERBAL SPECIES OF ALOE VERA:

Ilkogretim Online - Elementary Education Online, 2020; Vol 19 (Issue 3): pp.3079-3099
http://ilkogretim-online.org
doi: 10.17051/ilkonline.2020.03.735474

1) Aloe barbadensis:
It was observed that Acemannan polysaccharide contains trace minerals i.e. 90% rhodium and iridium which shows increase in T cells count and macrophages or WBCs count. Generation of nitric oxide lead to secretion of cytokines (e.g. interleukin-6, interferon-γ, interleukin-1 and tumor necrosis factor) by macrophage cells due to which size of thymus gland get enlarged upto 40%(Vishal et al. 2020).

10) IMMUNITY BOOSTER CAPSULES:
It is the herbal remedy of ayurveda which improves immunity very rapidly. It can be given to children who faced frequent sinus and throat infections. It is also effective against asthma, diabetes, cancer, chronic cough, Inflammed liver. It is also usedin treatment of females having frequent urinary tract infections.

PHARMACOLOGICAL EFFECT OF POTENTIAL HERBAL SPECIES OF IMMUNITY BOOSTER CAPSULES:

1) Bovine Colostrum:
Biswas P. et al., (2007) observed that Bovine Colostrum shows a dose dependent production of IL-12 by CD-14^{+} monocytes. It shows enhancement of INF-gamma in response to weak antigen stimulation and express inhibition of INF-gamma in response to strong antigen stimulation (Biswas et al. 2007).

CONCLUSION:

Undoubtely the leading role of Herbals as Immunomodulators and immunostimulants in boosting the immunity since the time immemorial in Indian system of medicine and in different regions of world is known. Due to high production cost, adverse effects, more chances of drug resistance of synthetic drugs, there is a boon in safe, potent, and economic herbal remedies[111]. The utilization of Chyawanprash, Sanjivanivati, Revital- H, Ashwagandha powder, Shilajit, Brahmi tablets, Safed musali powder, Amalaki capsules, Aloevera gel, Immunity booster capsules to boost the immunity are scientifically proven.
These formulations are made up of different herbal drugs which different potential activity against disorders such as cancer, diabetes, cardiovascular diseases, neural diseases, and these activities are scientifically evident too. Therefore, these formulations not only boost human immunity,theymay also prevent from various diseased conditions.
Standardized herbal formulations and designing and developing efficient immunomodulatory drugs is a promising area yet to be explored for the welfare and longevity of humans.

CONFLICT OF INTEREST:

The authors do not have any conflicts of interest.

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