RATIONALITY BEHIND AYURVEDA COMPOUND FORMULATIONS- A BIRD’S EYE VIEW

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ABSTRACT
Ayurveda is Indian heritage system of medicine gifted by ancient Acharya. It provides scientific approach for dealing human health issues with tools of nature like herbs, minerals, metals etc. It states that every substance in the universe can be applied as medicine with the help of Yukti or logical approach of physicians. In present era, whole world is looking towards Ayurveda for its novel natural healing modalities to get relief from their ailments whether physical or mental. Hence here is the need for development of more numbers of Ayurveda formulations to overcome the different health hazard. Moreover invention of more formulations for newly developed diseases like cancer, AIDS, dengue etc. is also needed. But these herbal preparations also face problems like adulteration, non-availability in a particular area or extinction of herbs due to excessive use of a particular herb. On this background present study was undertaken to analyse the fundamental rationality behind Ayurveda formulations mentioned in various ancient transcripts. Literary data regarding evolving a formulation was scrutinized with examples of important formulations mentioned in various texts. This study results out that for developing a particular formulation, factors like availability, palatability, potency, safety, efficacy etc. should be considered.

KEYWORDS: Ayurveda, Ayurveda formulations, herbs, compatibility specifications.

INTRODUCTION
Ayurveda is one of the traditional medicinal systems with an established history of many centuries. Ayurvedic medicine is ancient Vedic knowledge which is considered to be one of the oldest healing sciences and has survived until the present generation over many centuries of tradition. Originated in India thousands of years ago, Ayurveda is known as “the science of life,” focusing on bringing harmony and balance in all areas of life including mind, body and spirit. Ayurvedic medicines are divided into three classes, namely herbal, mineral and animal. The famous & authentic book of Ayurveda “Charak Samhita” states that-

“There is no substance in the universe which can’t be used as drug on the condition that they are used rationally and with a definite objective1.”

For therapeutic application of a Dravya (substance) in the real world, the scholar should considered the fact why and where to use that particular drug along with the Yukti (rationale) behind the application. Concentration should be given on the dose, time and duration applicable for a particular Doshas, Dushyas (specific pathological condition) and Prakritis (constitution) of a subject. These are the prime concerning factor for application of a Dravya (substance) in the form of medicine.

Best treatment should be of that type which treats the disease & should not produce other disease or any other complication. Same is applicable to a formulation also it should treat the disease & should not produce any disease or complication2.
kind of theory is applicable for a particular disease phenomenon also. In the pathogenesis of a disease, a combined effect of Dosha (basic humours) are responsible rather than single involvement of a Dosha (humours). Hence ancient scholars of Ayurveda used to conglomorate the single drugs into a formulation for getting a desired effect. But there are also drugs which don’t show their effects according to their Rasas. In these types of situations, drugs are used according to their effects. e.g. Pippali (Piper longum Linn.) & Nagar (Zingiber officinale Roscoe) are of Katu rasa but they are Vata pacifiers & exhibit Virshyakarma (aphrodisiac) also. So they are used according to their action. It means combined effects of drugs are considered on a particular disease. e.g. Amrita (Tinospora cordifolia Willd Miers ex Hook f. & Thoms.) has Pitta pacifying properties but when Amritarishta is prepared it pacifies Vata & does Brihankarkarma (strengthening action). On preparing formulation, it leaves its basic function. So here Amritarishta is used for Vatasanshman karma, Brihangan karma & therefore in Kamala (jaundice) & Pandu (anaemia). So combined effects of drugs are considered.

**Basic criteria & compatibility specifications for formulation development as per classical texts**

He is the best among physicians who knows application for external as well as internal actions, combinations & rational administration of these 500 drugs & 50 Mahakashayas.

About 6 Aasthapan skandha-dravyas the wise physician should eliminate the drug if it is not appropriate even if enumerated in the group & should add the appropriate one if it is unmentioned. If situation arises, a group may be combined with another or several other groups based on reasoning.

This is actually the basic criteria for developing an Ayurveda formulation & it is the basic principle.

Basic criteria which should be considered while preparing a compound formulation are:

1. Firstly drugs to be used should not be incompatible to each other. Otherwise they may create some harm to the body instead of benefits. 18 incompatibility types according to Charak which should be taken under consideration while deciding compatible & incompatible drugs:

   That which is antagonistic in respect of place, time, Agni, dose, suitability, Doshas, processing, potency, bowels, health conditions, order, contra-indication, indication, cooking, combination, palatability, richness in properties, rules of eating, is not wholesome for the person.

   a) Place- if in arid zone, rough & sharp substances, and in marshy region unctuous & cold ones are antagonistic.
   b) Time- if one takes rough & cold etc in the winter & pungent, hot etc. in the summer. It is antagonistic.
   c) Agni- antagonism of food & drinks in four types of Agni
   d) Dose- honey & ghee in equal quantity are antagonistic.
   e) Suitability- use of sweet, cold etc. by a person accustomed to pungent, hot etc. is antagonistic.

f) Doshas- use of drug, diet, behaviour similar to Doshas in properties but adverse to the person’s practice.

2. **Karma Viruddha (Action incompatibility):** While selecting drugs for a disease, care should be taken that they are not of opposite actions. If they are to be used then they should be added in that ratio that they only produce desirable effects & no side effects. e.g. excessive amount of arsenic with Guggulu (Commiphora mukul (Hook ex Stocks) Engl.) is contra indicated as it causes scraping of body by increasing roughness & dryness in body & aggravates Vata instead of pacifying it.

3. **Sanskars:** It is done to produce special effects in a drug. e.g. purification of Parad (mercury) & Gandhak (Sulphur) is done to remove their toxic effects & then Siddha makardhwaj is prepared by Kupipakvarasayan method.

4. **Yojna (plan):** That method which removes the bad effects & produce the desirable effects. E.g. While using nishoth (Operculina turpenthum Linn.), Shunthi (Zingiber officinale Roscoe) is also used to remove tenesmus produced by Nishoth.

5. **Samyog:** mixing of drugs to prepare a formulation. It is done to produce specific features in a formulation like:

   a) To remove side effects of a drug- side effect of Indrayan (Citrus coloynthis Schrad) is tenesmus therefore Shunthi is used along with it.
   b) To produce synergistic effects- to increase emetic effects of Madanphala (Randia dumetorum Lam.), jumutak (Luffa echinata Roxb.) juice is used as a Bhavnadraya.
c. To produce a limited check on speedy effects of drugs- mixing of honey & ghee. For this purpose Pichchhill, Snigdha, Manda drugs are used.
d. To act as catalyst-to increase the diuretic action of Badarpashan, decoction of Panchtrina is used along with it.
e. To act as preservatives- e.g. sodium benzoate, salt etc.
f. To produce desirable taste, smell & colour or to make it heavy. e.g. due to black colour & weird taste of Aaragvadh (Cassia fistula Linn.), sugar & honey is mixed. To produce good smell, Karpura (Cinnamonum camphora Nees & Eberm.), menthol etc. is added in formulations.
g. To produce some other desirable effects.

6. Place & time: patient belongs to which place, which type of Rasas are compatible to him etc. should be taken care of. Season, Ritu etc. a drug should be used with a specific drug to have good effects according to season. e.g. before meal, after meal, Rituharitki, Ritutrivitta sevan etc. Hingvashak churna is taken in mid of meal because of Samanavayuvikriti.

7. Upyogansantra (rules of using a drug): e.g. their Anupan etc. Anupan helps in easy & quick dispersion of drug in body & increases its bioavailability also. There are some examples of formulations & their vehicles prepared & used according to status of Doshas & diseases.

   e.g. These drugs (Madanphala) should be administered with vehicles according to Dosh, in Vata aggravation, wine, Sauvira, Tushodak, Maireya, Medaka, Dhanyaml, Phalama (different forms of liquor), sour curd should be used with drugs. Grapes, gooseberry, honey, milk etc. in Pitta & in Kapha, impregnated with or dissolved in honey, urine, decoction etc.²

   Sweet ball prepared of sugar, Trivphala (combination of Terminalia chebula Retz., Terminalia bellarica roxb., Emblica officinalis Gaertn.), Trivritta (Operculina turpenthum Linn.), Pippali (Piper longum Linn.), honey alleviates Sannipata, upward internal haemorrhage & fever. Powder of Trivritta, Trivphala, Vidang (Emblica ribes Burm.f.), Pippali, Yakvakshar- all mixed together taken with ghee or honey or should be made as sweet balls with jaggery. It alleviates Gulma, splenomegaly, dyspnoea, Halimak, anorexia & other disorders caused by Kapha & Vata.²

8. To protect the basic effects & characteristics of major drug: acidity of acid, basicity of a base, smoothness of ghee & oil etc. if a base is to be added in a formulation then its amount should be considered. As more amounts may suppress the effects of acid.

9. Posology or doses: before deciding dose following factors should be considered (Das vidha rog pariksha) – like Dushya (Dhatu & Mala), place, strength, time, Agni, constitution, age, psyche, suitability, diet, Ayvtha (status of body) ¹⁰

Mahrishi Kashyap gives so much importance to dose that he says it is the root of treatment. e.g. of doses according to Acharya Kashyap at different ages, dose of Basti according to age etc. quantity of ghee at different stages of age. To a neonate, ghee is given in one Vidangpraman. Then in every month, one Vidang is increased up to 12 Vidang or 2 Ratti etc.

Dose of Svaras is half Pala, decoction is Pala, Kalka is one Karsha, dose of Yograjguggulu is Udumbersam, Dhattivaleha & Muktaadichurna is one Panita. These all doses are medium doses which are suitable after Taranavastha (After 20-25 years of age).

   according to modern, following factors should be considered- age, sex, size & weight of body, constitution, tolerance, mental condition, status of disease, climate, fasting condition, time of administration, rate of absorption. These are more or less similar to Ayurveda.

Symptoms of properly made formulation:

The drug administered in proper dose is that which in small dose exerts great force & eliminates plentiful impurity, is easy, light in digestion, good in taste, saturating, alleviate disease, even in faulty application does not harm, does not cause much depression & is endowed with good smell, colour & taste.¹¹

Narayan churna

The most famous Ayurveda formulation for udar rog is Narayan churna. It contains Yavani (Carum copticum Benth & Hook), Hapush (Adiantum lunulatum Burm.), Dhanya (Coriandrum sativum Linn.), Triphala (combination of Terminalia chebula Retz., Terminalia bellarica roxb., Emblica officinalis Gaertn.), Upkunchika (Nigella sativa Linn.), Karvi, Pippalimula (root of Piper longum Linn.), Ajudanda, Shati (Hedychiunm spicatum Ham. Ex Smith), Vacha (Acorus calamus Linn.), Shatavaha (Anethumoswa Kurz), Jeerak (Cuminum cyminum Linn.), Vyosh (combination of Zingiber officinale Roscoe, Piper longum Linn., Piper nigrum Linn.), Swarnaksheeri (Argemon Mexicana Linn.), Chitrak (Plumbagozeylanica Linn.), Yavksahr (impure carbonate of potash), Pushkmura (Inular acemosa Hook.f.), Kusht (Sausurrea lappam C.B. Clarke), five types of salt, Vidang (Emblica ribes Burm.f.), Danti (Baliospermum montanum Muell.-Arg.), Vishala (Trichosanthes palmata Roxb.), Saptala (Acacia concina DC.).²

Best indicated for Virechakarma (purification) in Udar rog. For this purpose- Danti, Saptala, Trivritta are used as major drastic & irritant purgative drugs. Triphala, Srnakshir, Chitrak are Mal bhedak (stool softeners). Lavanpanchak & Kshar act as osmotic purgatives. They all produce synergistic effects here. To have desired rate of this purgation, some Grahi (anti-diarrhoeal) drugs are also added like Hapusha, Dhanyak, Jeerak. To prevent side effects like tenesmus, Upkunchika, Pippali are added. Rest drugs are used to treat the root cause of disease for Aampachan karma, Deepan karma etc. Specific Anupan (adjuvants) are also depicted for particular diseases. These particular drugs here may act as catalyst or to enhance the potency of this formulation for that particular disease. To use this formulation Snigdhakoshttha (smooth bowel) is indicated to facilitate easy downward movement of faeces which is done with Sar property of Sneha (ghee etc.).

Vasaavleha

It is prepared with juice of Vasa (Adhatoda vasica Nees), Sita, pippali (Piper longum Linn.), Gaghrita & honey

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used in Rajayakshama, Pattikkasa, Rakta pitta etc\textsuperscript{13}, Tikta rasa & Rukshaguna of Vasa aggravates Vata, to pacify it, ghee roasted Pippali is added in it. Pippali is also used to enhance the effect of Vasa. Ghrita is used to prepare its Avleha. Sugar & honey is used to make it tasty & for Avleha property.

\textbf{Kaanchnar guggulu}

Triphala (combination of Terminalia chebula Retz., Terminalia bellarica roxb., Emblica oficinalis Gaertn.), trijata (combination of Ellettaria cardamomum Maton, Cinnamomum zeylanicum Blume, Cinnamomum tamala Nees & Eberm), Trikatu (combination of Zingiber officinalis Roscoe, Piper longum Linn., Piper nigrum Linn.), Guggulu (Commiphora mukul Hook ex. Stocks) Holmes), stem bark of Varun (Crataevarvula Buch.-Ham.) & Kaanchnar (Bauhinia variegata Linn.) are ingredients, used for Gandmala, Apachi, Arbuda, Gulma etc\textsuperscript{14}. In this preparation, Kaanchnar is a major ingredient and Guggulu & Varun bark have synergistic effects. Triphala is added for pacifying Kapha pitta & Agnimandya & because of its Bhedankarma, it also enhances the effects of Kaanchnar. Similarly Trikatu also enhances its effects. Guggulu acts as a binding agent to prepare its Vati. Trijata is added to bring Kapha in its natural state. It also performs preventive & curative role for infectious conditions of Gandmala. Trijata specifically acts on upper part of body, Gandmala is an upper body disease. Therefore it is added to perform multiple actions. These factors also influence their pharmacological activity. Researchers are being done to prove this also.

\textbf{Influence of season and place of collection}

Branches & leaves should be collected in rainy & spring season, roots in summer or in late winter when the leaves have fallen down or are fully matured, bark, tubers, latex in autumn, heartwood in early winter & flowers & fruits according to their season\textsuperscript{15}.

Time of collection of plant material is clearly indicated, in that time period, they give significant results. In one of the studies it has been shown that season of collection of raw drugs can influence the expression of pharmacological activity\textsuperscript{16}.

Paaririjata (Nyctanthes arbor-tristis Linn) leaves collected in different seasons (six samples) were subjected to pharmacological evaluation. It was observed that samples collected during September produced better anti-inflammatory activity in comparison to samples collected during other seasons. The leaves collected during November and July was almost inactive. In a study carried out by\textsuperscript{17}, Silajatu (a rock exudate) samples obtained from five different places were evaluated for different types of pharmacological activities. Differences in the activity profile were observed. Anti-depressant activity evaluation employing behavioral ‘despair’ test showed that among the five samples studied only Nepal and Gopeshwar samples showed significant activity while in other samples the activity was not significant\textsuperscript{18}.

\textbf{Influence of formulation type}

In a study carried out by\textsuperscript{19}, Yashtimadhu (Glycyrrhiza glabra Linn) was administered in three formulation forms and subjected to comparative evaluation. Yashti churna, Yashtighrita and Yashti Sharkara each containing same quantity of the Yashti were evaluated for anti-ulcer activity against forced swimming induced stress ulcers. Significant decrease in ulcer index was observed in Yashtighrita administered group; in other two groups only moderate and statistically non-significant decrease was observed. This clearly indicates that for attenuating the stress ulcers test drug given in the form of Ghrita is good\textsuperscript{19}.

\textbf{Influence of drug processing during preparation}

A study carried out by\textsuperscript{20} on A-Pancatkitagghrita involved preparation of the formulation by three methods and subjecting them to comparative study. The samples were: A-Pancatkitagghrita (PG-A) prepared after Ghrita murchanaa and using Triphalakalka; PG-B prepared by using Ghrita subjected to Murchanaa without Kalka; PG-C prepared only with plain Ghrita without subjecting it to Murchanaa and without using Kalka. Samples B and C produced significant potentiation of anti-body formation against Sheep Red Blood Cells (SRBC) in rats, whereas Sample-A produced only a weak and non-significant effect\textsuperscript{20}. This indicates drug preparation and processing methods can influence expression of pharmacological activity.

\textbf{Influence of adjuvant on the pharmacological activity}

A study was carried out\textsuperscript{21} by noting the effect of the test preparations on cyclophosphamide induced immuno and myelosuppression. The test drug Vacaadhaatraayadi Avaleha (VDAV) containing Vachaa (Acorus calamus Linn.), Dhatri (Emblica oficinalis Gaertn), Musta (Cyperus rotundus Linn), Pushkaramoola (Imula racemosa Hookf.), Jeeraka (Cuminum cyminum Linn.), Sankhapushpi (Convolvulus pluricaulis Chois.), Pippali (Piper longum Linn.), Sita (sugar), Kshaudra (honey), Sarpi (ghee) and Trikatu was evaluated for immunopotentiation effect at the dose of 900 mg/kg. As one of the control group Avaleha prepared with ghee, honey and Sharkara (1:2:4) (ADJ) - 900 mg/kg was used. The observed effect was compared against a water control group. Administration of cyclophosphamide caused significant suppression in anti-body formation. This immunosuppressant activity was reversed by both VDAV and ADJ. However, only the effect observed with VDAV was found to be statistically significant. The myelosuppression produced by the toxicant was also reversed by both ADJ groups and VDAV\textsuperscript{21}. The results obtained indicate in many cases adjuvant used may not be inert but per se may produce significant pharmacological activities. The above illustrations are just few examples of a vast array of factors that may influence expression of pharmacological activity. Use of cultivated raw material or naturally collected material, processing methods like Murchanaa, Sodhana, Avartana, number of Putas (method of heating) while preparing a Bhasma all have influence over expression of pharmacological activity.

\textbf{Basis of nomenclature of a formulation}

- **First user:** e.g. Chyawanprash
- **Major ingredient:** Dhatriavleha, Dadiadaighrita, Ashwagandhaavleha, Kumariasav, Maharasnaadiwkath.
• **Creator**: Ardhnarishwaras created by lord Shiva, Vishnu tail created by lord Vishnu, Dhanvantarghrita - by lord Dhanvantri.
• **Creator & Major ingredient**: Agastya haritki, Sayambhuvguggulu - guggulu is major ingredient & Sayambhu is name of lord Brahma.
• **Time of its preparation**: Pushyanugchurna prepared in Pushyanagnokshtra.
• **Specific effects**: Phalaghritha- Santanotpatti result, Mritisanjivanagad.
• **Upma**: Sudarshanchurna - relieves the diseases just like lord Krishna's Sudarshan chakra, Narayan churna - as lord Vishnu takes all the sins of persons just like that Narayan churna relieves group of diseases, Mahanarayan tail - prepared by lord Narayana for treating bone fractures during war between lords & devils.
• **Based on morphology**: Rasa parpati
• **Based on dosage**: Shatpalghrit, Ksheershatpalshrita, shad Bindu tail.
• **Based on number of contents**: Tryodashangguggulu, Dashanglepa, Dadimastakchurna, Hingvashakchurna, Navayaslash, Panchgavyaghritha.
• **Based on their effect on that diseases**: Shotharilauh, Amlapittantaklauh, Ajirnakanaktras, Krimignikutika, Aamvatataris, Smritisagaras.
• **Based on processing**: Shatdhaughtgrita, Shatputi abhralk bhasma, Putpakva vishajmarwantonklauh.

**Chronological level of research in drug formulation**

From Samhita period, researches were done according to the concept of disease & their treatments. Drugs were added or deleted from the formulation without taking caution of its taste, storage, shelf life etc. now time has changed. Many drugs are added or removed keeping in mind of their taste, palatability, storage, shelf life etc. Drugs are replaced depending on their availability in that area or with their substitutes. Sometimes drugs are also altered if they are controversial drugs. A few examples are:

• **Chyanwanprash**: Acharya charak used only five drugs of Ashvargha while preparing it21. But at later times, in Sharangdhar Samhita, Sharangdhar started using seven drugs of ashtavarga22. It may be due to with time, immunity of people might have gone down, so to provide them better immunity two more drugs were added in it. Otherwise all ingredients might be same till now. But in place of Ashvargha, their substitutes are being used today because of their unavailability in the market. Amount of sugar, honey & ghee are also different today to make it more palatable & tastier. Presently mango flavours, orange flavours are also available in a tastier form.

• **Rajpravartiniviti**: According to Bhaishyaratnavali, it is prepared with Kasis, tankan, Hingu & Ghritakumari (Aloe vera) Tourn.ex Linn. 23. But now, all ingredients are altered with seeds of soya, carrot, Ulakambal, bamboo root along with previous drugs to get better results & to avoid any complication.

• **Chandraprabhavati**: In this formulation, Chandraprabha is a controversial drug. Different writers take it a different drug according to their open-mindedness & availability in their area. Aadhalm in his Deepika commentary on Sharangdhar Samhita takes Kapur & Shati (Hydichium spicatun Buch. Ham) in the name of Chandraprabha. In Gudharthdeepika, it is a Kapur variety. In Vaidyakshabda Sindhu, it is Bakuchi (Psorala corylifolia Linn.) or Kachur. In Rasendrasar sarangah, it is shat24. In the present era, it is taken as shati. Writer of Ayurveda sarasangrah takes it Kapur kachhari25. Rastanrasar & Siddha prayogsangrah take Kapur in the name of Chandraprabha26. In Bhaishyaratnavali, three types of Chandraprabhavati are mentioned, one for Arsh & two for Premeha rog. For Premeha, Kapur is used in the name of Chandraprabha along with coriander, sugar & Trivrtita. For getting the anticipated effect in Arsh, Kachuris used in the name of chandraprabha27.

• **Prasrini tail**: It is used to pacify vatic disorders. Prasrini is also a controversial drug. In south, this oil is prepared with Merremia tridentata (L) Hellier f. In Rajasthan type xerophytic area, Khinip (Leptadenia pyrotechnica W. & A.) is taken in the name of Prasrini. Khinip is used to prepare this formulation. Both Merremia tridentata (L) Hellier f. & Khinip have same action i.e. Vata pacifying property. By way of both drugs, this oil gives results.

• **Chandan prash**: 26. In this formulation, Chandran is a controversial drug. Many writers take it a different drug according to their open-mindedness & availability in their area. Aadhalm in his Deepika commentary on Sharangdhar Samhita takes Kapur & Shati (Hydichium spicatun Buch. Ham) in the name of Chandraprabha. In Gudharthdeepika, it is a Kapur variety. In Vaidyakshabda Sindhu, it is Bakuchi (Psorala corylifolia Linn.) or Kachur. In Rasendrasar sarangah, it is shat24. In the present era, it is taken as shati. Writer of Ayurveda sarasangrah takes it Kapur kachhari25. Rastanrasar & Siddha prayogsangrah take Kapur in the name of Chandraprabha26. In Bhaishyaratnavali, three types of Chandraprabhavati are mentioned, one for Arsh & two for Premeha rog. For Premeha, Kapur is used in the name of Chandraprabha along with coriander, sugar & Trivrtita. For getting the anticipated effect in Arsh, Kachuris used in the name of chandraprabha27.

For modifying ingredient of a formulation to make it more suitable for the purpose of therapeutic uses, factor should be considered for the desired & better pharmacological action. There is no harm in modifying the classical formulations according to taste, palatability & stability.

**Status of drug formulations in current era**

In the present era, many formulations are available in the market, which are not as per classical texts but are physician’s personal experience based or prepared on logic of combinations. But irony is that all preparations don’t give satisfactory results. Main problem is non-availability of exact classical drugs in the market. Adulterants are sold in the name of original drugs. Some drugs are rare, in place of them, some other materials are being provided in the market. Some costly drugs are not added in the formulation but their name is indicated on the labels. One of the commonest preparations which don’t
give proper result is Sitopladichurna. Vanshlochan is added in this preparation. But in the market, in place of original Vanshlochan which is collected from bamboo, chemically prepared Vanshlochan is being provided which does not have said properties. Chemically prepared Vanshlochan is added in the preparation which doesn’t give results. Same happened with Avipattikar churna, it is used for Sukhvirechan karma (purgation). Avipattikar churna available in the market does not give satisfactory results. Reason is Trivittra (Oerculina turpenthum Linn. Muell.-Arg.), which is major ingredient of this formulation is now a threatened plant. In place of it, Murva (Marsdenia tenacissima W. & A.) is being sold in the name of Trivittra in the market which is used in formulations & doesn’t give results. Same happens with Shilaj itu (Asphaltum pujabinum) & Rasanj (prepared from decoctions of Berberis aristata DC.) preparations. Second problem arises with the preparation of classical formulations. If exact classical methods & proper procedures are not followed, those formulations do not give proper results. According to Sharandhar Samhita, while doing Ksheerpak, drugs, milk, water should be mixed in 1:8:32 ratio\(^2\), when it is disturbed their results also get disturbed.

But there are some patent drug formulations & standard pharmacies, which are using authentic drugs with proper purifying procedures & with classical methods, they give good results also.

**Principles & factors used in contemporary Yoga Vigyan**

Initially five dosage forms Swaras, Kalka, Kwath, Hima, Phanta were formulated. They were of short shelf life. To increase shelf life of the drug, the preparations with more stability like Vati, Taila, Ghrita were introduced. Some preparations with food articles fortified with medicines like Lehya were also made to have the acceptability of sensitive patients having aversion to medicines. Other commonly used forms Arechurna, Arka, Kshar, Aasav-Arishta, Parpati. The details of dietetic preparations such as various types of gruels, soup are also available. Ointment, creams, liniment, syrup, granules, capsules, candy etc formulations are also available in market. In preparing these formulations, some additives are also added which are:

**Excipients:** these are inert substances which don’t have any therapeutic efficacy but are used in preparing a formulation.

**Uses of excipients:** to increase stability, for preservation & storage, maintain bioavailability, for compounding & dispensing.

Granules are the first stage of tablet formulation formed with additives & water.

**In Tablets:** additives- magnesium stearate, talcum powder, binding agent like Guggulu, guar gum, acacia gum. Use of additives in tablet:-

- Escalates the flow property which brings uniformity in tablet.
- For dissolution & maintaining the disintegration time tablet will get disintegrated & dissolve in a specific time. E.g. disintegration time of Guggulu is very high, it passes from the GI tact as such without producing any effect. Additives controls this time according to need of body.
- Friability & hardness- to save tablets from breaking like while transportation. Additives provide definite hardness to tablets which protects them bad handling even.
- Coating agents- To make formulations more palatable, tasty & to protect them from oxidation. E.g. sugar coating & film coating is used.

**In Syrup:** Following ingredients are supplementary along with drugs.

- Coloring agent- food grade colours are used.
- pH regulator- to maintain acidic pH, citric acid is used for this purpose.
- Diluant- sugar solution, glucose solution.
- Preservative- neprazine, nepasole, sodium benzoate.
- Flavouring agent- rose, fennel.

**In capsule:** no additives only capsule shells are used made up of soft or hard gelatin or veggie cap to hold powder material & saves from oxidation.

**In ointment/cream:** additives- stearic acid, cetyl alcohol, bees wax, soft, hard, liquid paraffin, water, coconut oil, triethyllomine, colorant, flavouring agent like Karpura & preservatives.

**In Avalaha:** flavouring agents & preservatives.

**Modern view about Ayurveda drug formulation**

The form of drugs which ultimately comes into use by the patient is termed as a drug delivery system or drug dosage form. Safety, Efficacy, Stability and Palatability are the four basic requirements of a good drug dosage form. The pharmaceutical procedures for any drug involve various steps starting from identification & collection of authentic raw material, application of standardized processing, techniques & production of quality drug, to packaging & storage of finished drug. Drug formulation in Ayurveda is based on two principles: Use as a single drug and use of more than one drug, in which the latter is known as Poly Herbal Formulation. This key Ayurveda therapeutic herbal strategy exploits the combining of several medicinal herbs to achieve extra therapeutic effectiveness, usually known as polypharmacy or polyherbalism.

Even though the active phytochemical constituents of individual plants have been well established, they usually present in minute amount and always, they are insufficient to achieve the desirable therapeutic effects. For this, scientific studies have revealed that these plants of varying potency when combined may theoretically produce a greater result, as compared to individual use of the plant and also the sum of their individual effect. This phenomenon of positive herb-herb interaction is known as synergism. Certain pharmacological actions of active constituents of herbas are significant only when potentiated by that of other plants, but not evident when used alone.

Based on the nature of the interaction, there are two mechanisms on how synergism acts (i.e., pharmacodynamics and pharmacokinetic)\(^3\). In terms of
pharmacokinetic synergism, the ability of herb to facilitate the absorption, distribution, metabolism and elimination of the other herbs is focussed. Pharmacodynamic synergism on the other hand, studies the synergistic effect when active constituents with similar therapeutic activity are targeted to a similar receptor or physiological system. Other than that, it is believed that multiplicity of factors and complications cause diseases in most of the cases, leading to both visible and invisible symptoms. Here, combination of herals may act on multiple targets at the same time to provide a thorough relief\(^3\)

**CONCLUSION**

After proper reviewing of classical texts, it can be concluded that in an Ayurveda formulation, there can be a single drug or more drugs in a formulation. While drug development, one or two drugs are major drugs which performs main action for a particular disease. Some drugs are mixed to get synergistic effects. Some drugs are added to reduce adverse effects. Many drugs are added to get colour, flavour for better palatability & to get a specific dosage form. Sometimes drugs are also given with some adjuvants to surge effects & increasing bioavailability. According to modern pharmaceutics, some drugs are also added in Ayurveda formulations to increase bioequivalence for avoiding batch to batch variations, to reduce dose size & minimize quantity of excipients. This is generally done for increasing pharmacokinetic profile of a formulation to get faster onset of actions. To formulate a new compound, these all factors should be considered.

**REFERENCES**


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