



International Journal of Traditional and Complementary Medicine
(ISSN: 2474-1361)



COMPUTATIONAL STUDIES OF DUSPARSAKADI KWATHA AN AYURVEDIC CLASSICAL MEDICINE FOR HEMORRHOIDS

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ABSTRACT

There are many methods to theoretically compute the efficacies of modern medicaments. These methodologies are not suitable for computing the efficacies of formulations used in Alternative Systems of Medicines especially to Ayurvedic formulations. In this paper a computational method developed earlier for computing the Drug Efficacy Indices of Ayurvedic formulations was applied to Dusparsakadi Kwatha a formulation for treating Hemorrhoids. The primary study objective of this research is to compute and compare the Drug Efficacy Indices of various possible combinations mentioned in the Classical Texts for treating Hemorrhoids and marketed by modern manufactures under the name Dusparsakadi Kwatha. The linguistic analysis of the corresponding verse of the classical formulation was done using the language interpretation methods based on Paninian concepts. The Drug Efficacy Indices were computed using the earlier reported formula. It is not a clinical study and purely theoretical methods based on the philosophical background of Ayurveda are applied. The computed Drug Efficacy Indices of some of the possible combinations were found more than the marketed formulation. These combinations were successfully practiced by many learned traditional practitioners by adhering to the meaning of the verses of classical texts. The studies successfully computed the efficacies of various combinations. It also showed that the research methodologies must be based on the philosophical background of Alternative Systems of Medicine alone can be successfully applied to their fields.

Key words: Efficacy, Drug Efficacy Index[Q(VPK)], Dusparsakadi Kwatha, Hemorrhoids, Arsoroga

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How to cite this article:

Abhilash Mullasseril. COMPUTATIONAL STUDIES OF DUSPARSAKADI KWATHA AN AYURVEDIC CLASSICAL MEDICINE FOR HEMORRHOIDS. International Journal of Traditional and Complementary Medicine 2016; 1(2): 0024-0032.

Published September 29 2016.

eSciencePublisher
eSciPub LLC, Houston, TX USA.
Website: <http://escipub.com/>

Table 1: The Drug Efficacy Indices [$Q_{(VPK)}$] of *Dusparsakadi Kwatha* and its individual constituents.

S I . No.	Content	Ratio	Qv	Qp	Qk	$Q_{(VPK)}$	Pharmacological Type and Properties
1	Dusparsakadi Kwatha (I,II,III,IV &V)	1:1:1:1:4	22.67	-17.39	-59.94	0.55	Pitta-Kaphaghni Rasa : Tikta (69%) Katu (25%) Veerya : Ushna (88%) Vipaka : Katu (88%)
2	Dusparsa(I)	1	42.42	-45.45	-12.12	0.15	Kapha-Pittaghni Rasa :Tikta (85%), Katu (10%) Veerya :Seeta (100%) Vipaka :Katu (100%)
3	Vilwa(II)	1	18.75	-20.83	-60.42	0.63	Pitta-Kaphaghni Rasa : Tikta (85%) Kashaya (10%) Veerya : Ushna (100%) Vipaka : Katu (100%)
4	Yavani(III)	1	20.00	20.00	-60.00	0.20	Kaphaghni Rasa : Katu (100%) Veerya : Ushna (100%) Vipaka : Katu (100%)
5	Nagara(IV)	1	-33.33	33.33	-33.33	0.33	Vata-Kaphaghni Rasa : Katu (100%) Veerya : Ushna (100%) Vipaka : Swadu (100%)
6	Patha(V)	1	19.15	-19.15	-61.70	0.62	Pitta-Kaphaghni Rasa :Tikta (95%) Veerya :Ushna (100%) Vipaka :Katu (100%)

INTRODUCTION

The contributions of the great ancient Indian *Rishis* or scientists to the field of Alternative Medicines are very precious and even found effective for managing various diseases in the modern era of medical sciences. In various ancient texts or *Samhitas* our forefathers explained their findings poetically in the scientific language Sanskrit very wisely for the benefit of the entire world. The modern scientists, researchers and even *Ayurveda* practitioners wonder how they arrived to these findings in those ancient days of primitive knowledge (?) with limited research facilities (?). The more I read and interrogate the subject matter the more I wonder and believe in their divine capabilities that lead to their findings¹. We can even find the most advanced concepts comparable with modern concepts that are helpful in the research fields such as drug designing and drug discovery². We wonder on the well claimed pharmacological activities attributed to those *yogas* or formulations and some of us believe and others don't on those claims merely because of the lack of well studied clinical evidences. Some of the modern researchers are working on those claims by merely applying modern methodologies suited for modern medicine research. But when we read through their reported clinical findings we can observe the limitations of those modern methodologies when applied as such to the field of *Ayurveda* research. The modern scientists believe that the active ingredients or active principles present in the drug used for the *yogas* or formulations are the root cause for their shown clinical activities. They also believe that the synthetic chemical equivalents of those active ingredients could be the best substituent for those herbs. But remember in *Samhitas* the ancient *Rishis* (Scientists) had mentioned different *Pratinidhi dravyas* for different situations instead of the main herb that may be entirely different in their active chemical ingredients. Even there might be numerous unrevealed chemical constituents present in these herbs that are yet to be clinically studied. It is worthwhile to recall a part of sloka attributed to Krishna the supreme lord to Arjuna viz. "*Swalpamapyasya Dharmasya Trayate Mahato Bhayat*" in *Bhagavat Gita*³. Similarly those unrevealed chemical constituents or revealed but not considered as the main constituents due to small quantities might be

the real attributers for the clinical activities. The methodologies accepted for the modern clinical researches for calculating the efficacies of drugs cannot be adopted for *Ayurveda* researches for many reasons. The prime reason is that those methodologies were developed based on modern scientific knowledge only for the modern drug research. The branches of alternative medicines like *Ayurveda* has a unique philosophy and the methodologies developed based on the very same alone has to be adopted for research applications. Here in this research paper a unique computational method developed based on the classical principles of *Ayurveda* alone is to be used to calculate theoretically the efficacies of various combinations explained in ancient texts.

Hemorrhoids- Ayurvedic concept: It is a varicose condition of the *hemorrhoidal* veins causing painful swellings at the anal canal. In ancient literature the *Hemorrhoids* or *Arsaoroga* are explained in various *Samhitas*. According to *Madhavakara* there are six types of hemorrhoids viz. due to the vitiation of single *doshas* (3types), due to the combined vitiation of all the *doshas* (1type), due to the vitiation of *Rakta dhatu* (1type) and *Sahaja* (1type)⁴. There are possibilities for the types due to the vitiation of two *doshas* and one another type due to the vitiation of all the three *doshas*. According to *Caraka* hemorrhoids or *arsas* is the *vikara* of *mamsadhatu* and its deficiency in the *hemorrhoidal* veins lead to *sirasaithilya* resulting aneurysms of *hemorrhoidal* veins. The piles or hemorrhoids may be internal or external based on their origin. The modern medical science classify piles those arise in the upper anal canal and lower rectum from the internal venous *hemorrhoidal* plexus to internal piles and those arise in the skin lined lower anal canal due to the enlargement of external *hemorrhoidal pluxes* to external piles. In addition they also classify the piles to non-bleeding and bleeding piles. Similarly *Caraka* clinically classify piles or *arsas* in to two varieties viz. *Ardra* and *Suska*. The piles that bleeds or 'make wet' which is a common sign of internal piles is known as *Ardra arsas* and the piles that 'seem to dry' which is a common sign of external piles as *Suska arsas*. According to *Susruta* the *arsas* is due to the combined vitiation of two *doshas* and surgery is preferred for curing. Based on the *tridosha* concept the internal hemorrhoids or

Table 2: The Drug Efficacy Indices [$Q_{(VPK)}$] of combinations in which individual constituent was mixed in a ratio (1:2) with *patha*.

Sl. No.	Con - tent	Ratio	Qv	Qp	Qk	$Q_{(VPK)}$	Pharmacological Type and Properties
7	I & V	1:2	28.75	-30.00	-41.25	0.43	Pitta-Kaphaghni Rasa :Tikta (92%) Veerya :Ushna (67%) Vipaka :Katu (100%)
8	II&V	1:2	19.01	-19.72	-61.27	0.62	Pitta-Kaphaghni Rasa:Tikta (92%) Veerya:Ushna (100%) Vipaka:Katu (100%)
9	III&V	1:2	22.58	-6.45	-70.97	0.55	Pitta-Kaphaghni Rasa:Tikta (63%) Katu (33%) Veerya:Ushna (100%) Vipaka:Katu (100%)
10	IV&V	1:2	9.52	-9.52	-80.95	0.81	Pitta-Kaphaghni Rasa:Tikta (63%) Katu (33%) Veerya:Ushna (100%) Vipaka:Katu (67%)

bleeding piles or *Ardra arsas* can be classified to *Rakta-Pitta* or *Pitta-Kapha* in nature and the external hemorrhoids or non-bleeding piles or *Suska arsas* can be classified to *Vata-Kapha Arsas* in nature⁵.

Hemorrhoids treatment- Ayurvedic concept:

In a nutshell for *Ardra arsas sodhanam*, *samanam*, *rakta stambhanam*, *rakta arsas cikitsa* and *adhogata rakta pitta cikitsa* can be adopted. Similarly for *Suska arsas vata-kapha hara*, *usna*, *srotosodhanam* and *vatanulomanam* can be advised. The sitz bath (hip bath) a form of hydrotherapy using hot and cold water, steam and ice to restore and maintain health is also advisable. The detailed descriptions are available in the classical literatures and are not the subject matters of this paper.

MATERIALS AND METHOD

In the *Arsacikitsita* chapter of *Astanga Hrudaya* a famous classical formulation marketed by various manufacturers under the name of *Dusparsakadi Kwatha* is mentioned for treating the pain of hemorrhoids⁶. The traditional practitioners were prescribing the formulation by suitably altering the ingredients after keenly observing the conditions of *Cikitsapurusha* the patient under treatment and the degree of ailments. They even avoided the *Dusparsaka* that contribute to the name of the *Kwatha/Kashaya* as per modern manufacturers from the formulation while practicing by strictly adhering to the Texts. In most cases they prepare the *Kwatha* without *Nagara* while treating the bleeding piles⁷. This yoga or formulation is also found as such in *Caraka samhita* in respective chapter dealing with *Arsa roga*⁸. The yoga or formulation is better known as *Pathadi yoga* by giving importance to the main ingredient. The individual components may vary as we observe the preparations and practices of Northern and Southern India. The *Fagonia arabica* is taken as *Dusparsaka*(I) in North and *Tragia involucrate* in Kerala while the *Vilva*(II) is *Aegle marmelos* all over India. The *Apium graveolens*(*Ayamodakam-North*) or *Trachyspermum ammi* (*Ayamodakam*) or *Cuminum cyminum*(*Jeerakam*) may be taken as *Yavani*(III) while *Zingiber officinalis* is *Nagara*(IV) all over India. The *Cissampelos pareira* is considered as *Patha*(V) in North India while *Cyclea peltata* is taken in Kerala. In this context the formulation mentioned in the classical

texts was critically analyzed and computed their efficacies theoretically. The computed Drug Efficacy Indices [$Q_{(VPK)}$] were tabulated and their numerical value along with other properties were found helpful to explain therapeutic values.

EXPERIMENTAL

The *kwatha yoga* or formulation marketed in the name of *Dusparsakadi Kwatha* citing the *Astanga Hrudaya* was critically analyzed to extract the real meaning by applying the *Anusaraka* concept⁹. For the same various available literatures on the formulation were collected and critically studied without any prejudice. The *rasa-guna-veerya-vipaka* of individual constituents were inputted scientifically and the Drug Efficacy Indices [$Q_{(VPK)}$] for various possible combinations were computed using the earlier reported formula¹⁰. The various combinations were also classified theoretically to respective classes according to their computed pharmacological effects (Table 1). The ingredient ratio to be maintained was not observed in any classical verses of this yoga or formulation. The method of preparation in common parlance was found those individual four ingredients in equal quantities and the prime ingredient *Patha* to be equal to four times of the individual ingredient constituting the half of the entire formulation. Hence the ratio maintained for this formulation was concluded to be (1:1:1:1:4) when all the five ingredients were taken for preparing this yoga. This was also scientific by following the modern equal a priority principle for the rest of the ingredients when the main ingredient is fixed as the half of the entire formulation. This is also the same method adopting in the *yagas* while distributing the *purodasa* in ancient times. This was also observed so in the most ancient epic Ramayana while distributing the *payasa* obtained as a result of the *Putrakamesti yaga* by the king *Dasaratha* to his wives. It is well known that the philosophical bases of *Ayurveda* are rooted to Vedas and hence we might get answers or hints to solve many unanswered problems if we keenly observe. The drug efficacy indices of the marketed formulation with five constituents in a fixed ratio (1:1:1:1:4) and the five individual constituents were computed. Based on the computational results the formulations were also classified according to their respective pharmacological types (Table 1).

Similarly the drug efficacy indices [$Q_{(VPK)}$] of the combination of each one of the constituents

Table 3: The Drug Efficacy Indices [$Q_{(VPK)}$] of combination in which two constituents are mixed in a ratio (1:1:2) with *patha*.

Sl. No.	Content	Ratio	Qv	Qp	Qk	$Q_{(VPK)}$	Pharmacological Type and Properties
11	I,II&V	1:1:2	26.44	-27.88	-45.67	0.47	Pitta-Kaphaghni Rasa :Tikta (90%) Veerya:Ushna (75%) Vipaka:Katu (100%)
12	II,III&V	1:1:2	21.51	-10.47	-68.02	0.57	Pitta-Kaphaghni Rasa:Tikta (69%) Katu (25%) Veerya:Ushna (100%) Vipaka:Katu (100%)
13	II,IV&V	1:1:2	12.88	-13.64	-73.48	0.74	Pitta-Kaphaghni Rasa:Tikta (69%) Katu (25%) Veerya:Ushna (100%) Vipaka:Katu (75%)
14	III,IV&V	1:1:2	15.25	1.69	-83.05	0.66	Kaphaghni Rasa:Tikta (48%) Katu (50%) Veerya:Ushna (100%) Vipaka:Katu (75%)
15	I,III&V	1:1:2	29.47	-20.00	-50.53	0.41	Pitta-Kaphaghni Rasa:Tikta (69%) Katu (25%) Veerya:Ushna (75%) Vipaka:Katu (100%)
16	I,IV&V	1:1:2	24.00	-25.33	-50.67	0.52	Pitta-Kaphaghni Rasa:Tikta (69%) Katu (25%) Veerya:Ushna (75%) Vipaka:Katu (75%),Swadu(25%)

with *Patha* in a fixed ratio (1:2) were computed and based on the computational results these formulations were also classified to respective pharmacological classes (Table 2).

The drug efficacy indices [$Q_{(VPK)}$] of a combination of two constituents with *Patha* in a fixed ratio (1:1:2) were computed and the combinations were classified (Table 3).

The drug efficacy indices [$Q_{(VPK)}$] of a combination of three constituents with *Patha* in a fixed ratio (1:1:1:3) were computed and those combinations were classified (Table 4).

The results of these combinations were discussed in detail in the concerned sections.

RESULTS AND DISCUSSION

The computed Drug Efficacy Indices of individual constituents were compared and the pharmacological activities on *Doshas* were found comparable with the allotted properties as per the classical texts. The *Dusparsaka* belongs to *Doorvadigana* according to *Vagbhata* and is *Pittasamana* in nature¹¹. The computational studies showed it have a predominant *pitta* pacifying capacity. The *Vilva* or *Bilva* belongs to *Varanadigana* and has *Kaphamedohara* property in addition to the capability to lead to *Mandagnitva*^{12,13}. It is well known that *Pitta* is *Agni* and anything that leads to *mandagnitva* might be due to decreasing *Pitta*. The computational studies showed that it have *Kapha* and *Pitta* pacifying capacity and classified to *Pitta-Kaphaghni* with more capacity to pacify *Kapha*. The *Yavani* belongs to *Pippalyadigana* and has a property to pacify *Kapha* and *sulaghni* in nature¹⁴. This was same observed from the computational studies. The *Nagara* also belongs to *Pippalyadigana* and has *Vatahara* property in addition to *Kaphahara* property¹⁵. The computational studies classified the *Nagara* to *Vata-Kaphagni* class. The *Patha* belongs to *Mustadigana* and *Aragvadadigana* according to *Susruta* and *Vagbhata* classifies it to *Aragvadadigana* and *Patoladigana*. For *Susruta* it is *Sleshmavishapaha*, *Sleshmanishudana* and *Kandughna*. According to *Vagbhata* it is *Kaphahara* and *Dushtavranavishodhana* and in addition it is also *Kapha-Pittahara*¹⁶. The concepts of *Susruta* and *Vagbhata* were found to be complementary and supportive to each other when we correlate further. The *Visha* belongs to *Pitta* nature more than *Vata* or *Kapha*. Hence

the *Sleshmavishapaha* might be considered as *Kapha-pittapaha*. The computational studies also showed that *Patha* is *Pitta-Kaphaghni* in nature with predominant capacity to pacify *Kapha*. The *Dusparsakadi Kwatha* belongs to *Pitta-Kaphaghni* category can be effectively used to treat the related pains of *Arsas* or piles of *Pitta-Kapha Doshik* nature. The *Ardra-Arsa* or bleeding piles or the internal hemorrhoids is considered to be *Pitta-Kapha-Arsa* in nature as evident from its clinical diagnosis and as well as from various ancient texts. So this classical formulation namely *Dusparsakadi Kwatha* belonging to *Pitta-Kaphaghni* is observed to be useful for treating bleeding piles. Among the individual combinations with a fixed ratio (1:2) the combination 10 (*Nagara* and *Patha*) showed a very high Drug Efficacy Index [$Q_{(VPK)}$] of 0.81 numerical value. Similarly among the various possible combinations of two constituents with *Patha* in a fixed ratio (1:1:2) the combination 13 (*Vilva*, *Nagara* and *Patha*) showed a very high Drug Efficacy Index [$Q_{(VPK)}$] value of 0.74. Of the various possible combinations of the three components with *Patha* in a fixed ratio (1:1:1:3) the combination 19 (*Vilva*, *Yavani*, *Nagara* and *Patha*) showed highest Drug Efficacy Index [$Q_{(VPK)}$] value of 0.66. It was observed that all these superior combinations contain *Nagara* as a component. Traditional practitioners many times avoid *Nagara* containing drugs while treating bleeding piles in a maximum possible manner¹⁷. The other combinations like 8, 9 & 12 without *Nagara* also showed higher Drug Efficacy Index [$Q_{(VPK)}$] values than the marketed *Dusparsakadi Kwatha* and those combinations could be selected for handling such cases effectively.

CONCLUSION

The present study showed the application of computational studies to theoretically predict the efficacies of various combinations of *Pathadi yoga* or *Dusparsakadi Kwatha yoga* explained in the classical texts. The Drug Efficacy Index [$Q_{(VPK)}$] values of individual components and various combinations of them were calculated and compared with the properties as mentioned in classical texts. The usual ratio of combination taken by the traditional practitioners can also be found scientifically explained with the present studies. The further computational studies are going on to explain scientifically how the

Table 4: The Drug Efficacy Indices [$Q_{(VPK)}$] of formulations with a combination in which three constituents are mixed in a ratio (1:1:1:3) with *patha*.

Sl. No.	Content	Ratio	Qv	Qp	Qk	$Q_{(VPK)}$	Pharmacological Type and Properties
17	I,II,III&V	1:1:1:3	25.96	-20.00	-54.04	0.48	Pitta-Kaphaghi Rasa :Tikta (76%), Katu(17%) Veerya:Ushna (83%) Vipaka:Katu (100%)
18	I,II,IV&V	1:1:1:3	22.04	-23.27	-54.69	0.56	Pitta-Kaphaghi Rasa:Tikta (76%) Katu (17%) Veerya:Ushna (83%) Vipaka:Katu (83%)
19	II,III,IV&V	1:1:1:3	17.22	-8.13	-74.64	0.66	Pitta-Kaphaghi Rasa:Tikta (62%), Katu (33%) Veerya:Ushna (100%) Vipaka:Swadu (83%)
20	I,III,IV&V	1:1:1:3	24.23	-16.30	-59.47	0.52	Pitta-Kaphaghi Rasa:Tikta (62%), Katu (33%) Veerya:Ushna (83%) Vipaka:Swadu (83%)

ratios found in common parlance were fixed by the ancient scientists for preparing various formulations in addition to introduce a new software for predicting the efficacies of various combinations.

AUTHOR DISCLOSURE STATEMENT

There is no conflict of interest.

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