

PHARMACOGNOSTICAL ANALYSIS OF *VACHADIVATI* – A POLYHERBAL FORMULATION IN THE MANAGEMENT OF OVERWEIGHT CHILDREN.

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ABSTRACT:

In India, we are still struggling with the burden of malnutrition but the issue of over-nutrition cannot be ignored. Childhood obesity is a burden in developed and developing countries. Overweight (*Sthaulya*) and obesity (*Atisthaulya*) are caused by numerous social and environmental factors that influence people's food habit and physical activity. *VachadiVati* is an Ayurvedicpolyherbal preparation comprising of *VACHA*(*Acoruscalamus*Linn.), *MUSTA*(*Cyperusrotundus*Linn.), *DEVADARU*(*Cedrusdeodara*Roxb.), *SHUNTHI*(*Zingiberofficinale*Roxb.), *ATIVISHA*(*Aconitum heterophyllum*Wall.), *HARITAKI*(*Terminalia chebula*Retz.). *VachadiVati*helps to reduce *Kapha*, which is the basis of fat accumulation, and it improves fat metabolism, hindering further fat deposition. These medicinal herbs can correct *Kapha* imbalance and help in weight loss. So for the treatment of overweight children, an Ayurvedic formulation of *VachadiVati* was selected. The standardization was carried out to the finished product *VachadiVati* to confirm its identity, quality, and purity. The pharmacognostic work reveals that presence of Starch grain of *Shunthi*, Stone cells of *Musta*, Pitted stone cells of *Vacha*, Group of fibres of *Musta*, Starch grain of *Ativisha*, Scleroid of *Haritaki*, Brown content of *Devadaru*, Prismatic crystal of *Devadaru*, Trichome of *Haritaki*, Scleroid of *Vacha*, etc. was observed microscopically. Organoleptic features of coarse powder made out of the crude drugs were within the standard range as mentioned in the classic.

Keywords-*VachadiVati*, *Sthaulya*, Overweight, Obesity

INTRODUCTION:

Obesity can be seen as the most prominent wave of the defined group of non-communicable diseases called "New World Syndrome", which is causing a huge social economic and public health liability in poor countries. The World Health Organization has described obesity as one of today's most neglected public health problems, affecting every region of the globe.^[1] The most important consequence of childhood obesity is its persistence into adulthood with all its health risks. The health risks include cardiovascular diseases, diabetes, osteoarthritis, gallbladder disease, and some sex hormone-sensitive cancers. It is more likely to persist when its onset is in late childhood or adolescence. Mortality risk increases with the increased weight of children. Globally, an estimated 10% of school-aged children, between 5 and 17 years of age, are overweight or obese. In India, many studies have shown that the prevalence of overweight among adolescents varies between 10% and 30%.^{[2][3][4][5][6]} According to the Centers for Disease Control and Prevention (2014), childhood obesity has doubled in children and has been quadruple in adolescence in the last 30 years. Poor dietary intake, physical inactivity, and lifestyle patterns are found to be the major reasons for obesity.^[7]

Vachadi Vati is an Ayurvedic polyherbal preparation comprising of comprising of *Vacha* (*Acorus calamus* Linn.), *Musta* (*Cyperus rotundus* Linn.), *Devadaru* (*Cedrus deodara* Roxb.), *Shunthi* (*Zingiber officinale* Roxb.), *Ativisha* (*Aconitum heterophyllum* Wall.), *Haritaki* (*Terminalia chebula* Retz.).^[8] As per the *Rasapanchaka* of the ingredients of the *Vachadi Vati* the drugs like *Vacha*, *Musta*, *Devadaru*, *Shunthi*, *Ativisha*, and *Haritaki* have *Tikta-Katu Rasa*, *Ruksha-Laghu Guna*, *Ushna Veerya*, *Katu/Madhur Vipaka* hence they together have *kapha-medhohara* properties along with *Lekhaniya* and *dipaneeya* action.^[9] They work by the principle of *Guru Cha Atarpana* (heavy and non-nourishing diet) which regulates the hunger and satiety center thereby regulating the energy intake of a person. This aids in the proper utilization of stored fat to fulfill the energy needs. As it is in *Vati* form its intake is very easy and does not create any difficulty for the subjects for its consumption.

MATERIALS AND METHODS

Drug Material

Raw drug materials were collected from the pharmacy store of Gujarat Ayurved University. The ingredients and the part used are given in the table.

Table no. 1 Ingredients of *VACHADIVATI*^[8]

SR. NO.	Ingredient	Botanical Name ^[8, 10]	Parts Used ^[8, 10]	Ratio
1.	<i>VACHA</i>	<i>Acorus calamus</i> Linn.	Dried Rhizome	1 parts
2.	<i>MUSTA</i>	<i>Cyperus rotundus</i> Linn.	Dried Rhizome	1 parts
3.	<i>DEVADARU</i>	<i>Cedrus deodara</i> Roxb.	Dried Heart wood	1 parts
4.	<i>SHUNTHI</i>	<i>Zingiber officinale</i> Roxb.	Dried Rhizome	1 parts
5.	<i>ATIVISHA</i>	<i>Aconitum</i>	Dried Root	1 parts

		<i>heterophyllum</i> Wall.		
6.	<i>HARITAKI</i>	<i>Terminalia chebula</i> Retz.	Dried fruit	1 parts

Method of Preparation of the Vachadi Vati:

Vacha, Musta, Devadaru, Shunthi, Ativisha, Haritaki were taken in given proportion and made into fine powder and sieved in mesh no. 80. The powders were mixed well in mass mixing machine until a homogenous mixture was obtained. Out of total amount of drugs, 10% of the crude drugs were used for the preparation of decoction. Thereafter, the above-mentioned powders were mixed with decoction and *Vati* of 500 mg each was prepared.

Pharmacognostical study

The Pharmacognostical study comprises of organoleptic study and microscopic study of the finished product.

Organoleptic study

The organoleptic characters of *Ayurvedic* drugs are very important and give the general idea regarding the genuinity of the sample. Organoleptic parameters like taste, color, odour, and touch were scientifically studied in pharmacognosy laboratory, I.P.G.T & R.A. Gujarat Ayurved University, Jamnagar under expert guidance.^[11]

Microscopic Study

Vachadi Vati was powdered and dissolved with water and microscopy of the sample was done without stain and after staining with Phloroglucinol + HCL. Microphotographs of *Vachadi Vati* were also taken under a Corl-ziesstrinocular microscope.^[12]

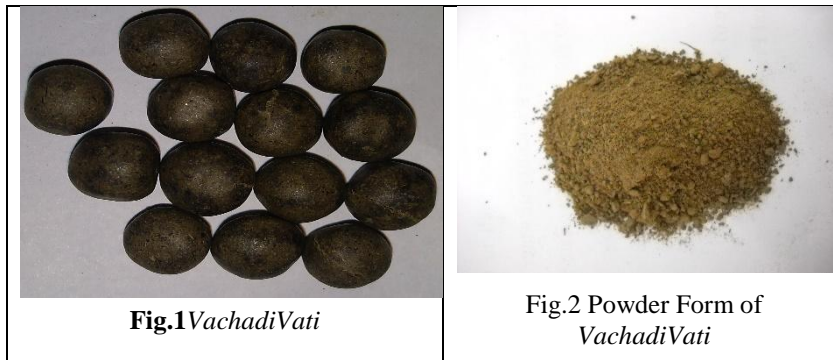
RESULTS AND DISCUSSION VACHADIVATI:

Fig.1 Vachadi Vati

Fig.2 Powder Form of Vachadi Vati

Morphology/ Appearance

1. Shape- Round

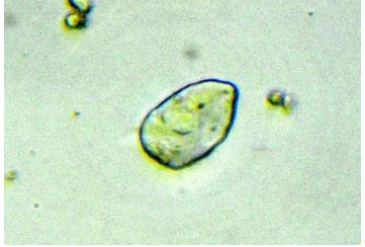


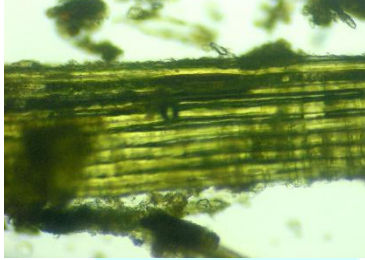
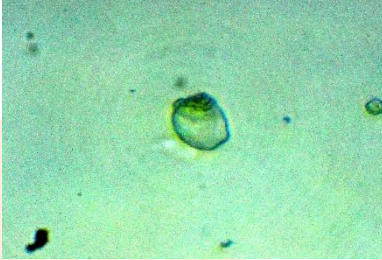
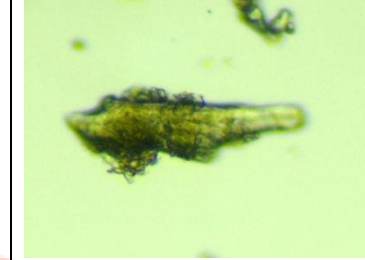


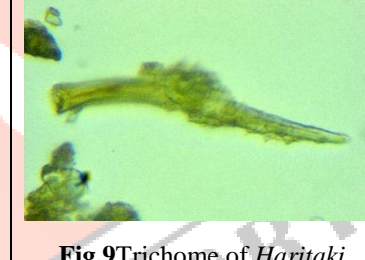

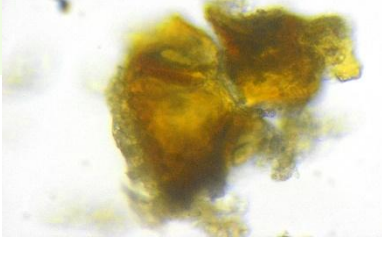
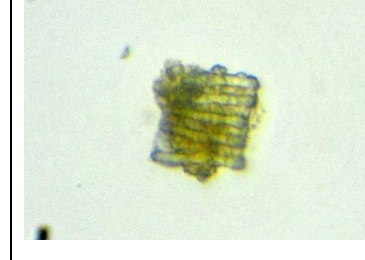
Organoleptic characters

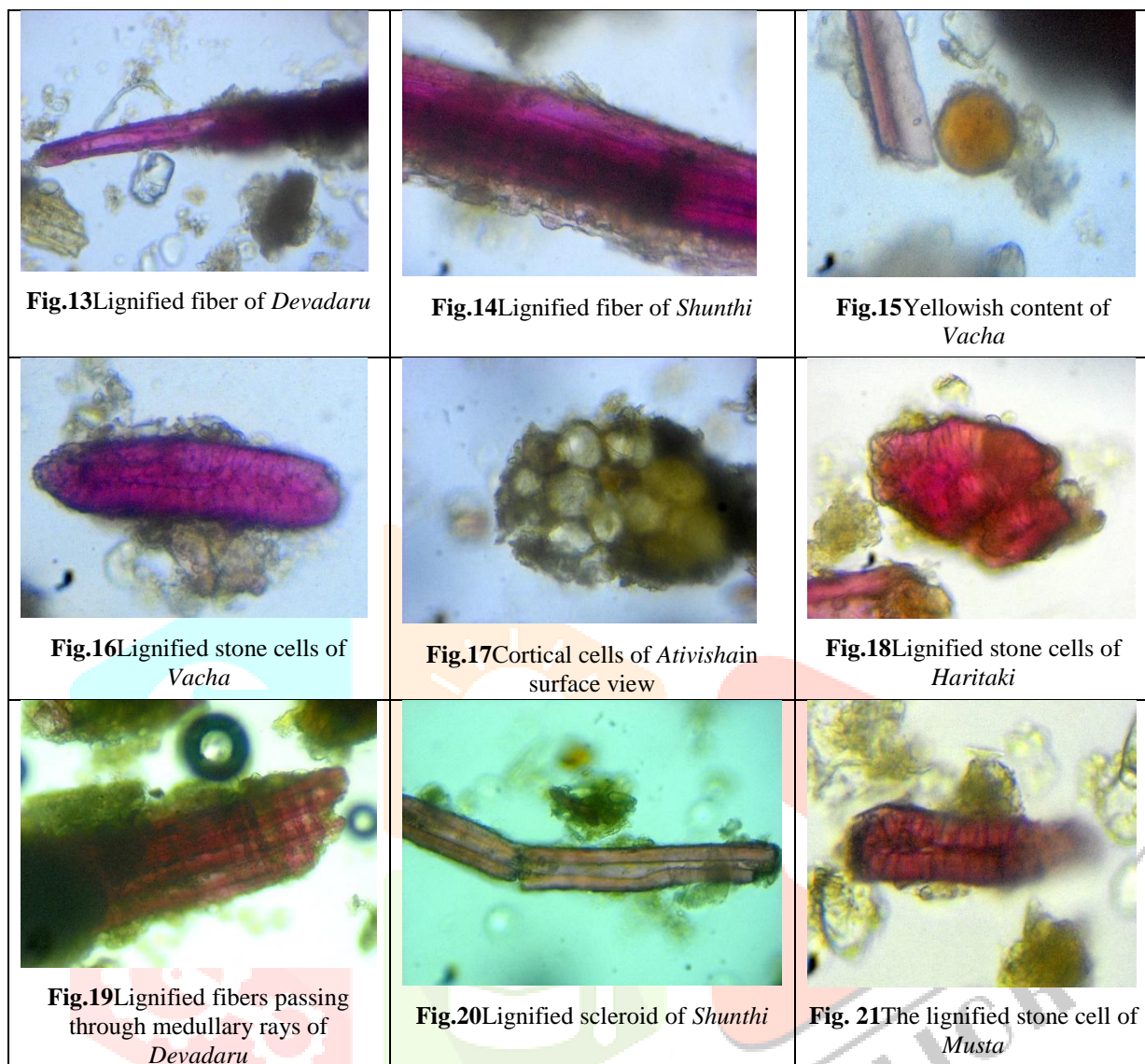
1. Color- Brownish
2. Odor- Aromatic
3. Taste- Bitter astringent
4. Touch- Smooth

Microscopic characters

1. Starch grain of *Shunthi*.
2. Stone cells of *Musta*.
3. Pitted stone cells of *Vacha*.
4. Group of fibers of *Musta*.
5. Starch grain of *Ativisha*.
6. Scleroid of *Haritaki*.
7. The brown content of *Devadaru*.
8. Prismatic crystal of *Devadaru*.
9. Trichome of *Haritaki*.
10. Scleroid of *Vacha*.
11. The oleoresin content of *Shunthi*.
12. Fragment of an annular vessel of *Ativisha*.
13. The lignified fiber of *Devadaru*.
14. The lignified fiber of *Shunthi*.
15. The yellowish content of *Vacha*.
16. Lignified stone cells of *Vacha*.
17. Cortical cells of *Ativisha* in surface view.
18. Lignified stone cells of *Haritaki*.
19. Lignified fibers passing through medullary rays of *Devadaru*.
20. Lignified scleroid of *Shunthi*.
21. The lignified stone cell of *Musta*.

Table No. 2 Main constituents seen in a microscopic study of *VachadiVati*:

 <p>Fig.1 Starch grain of <i>Shunthi</i></p>	 <p>Fig.2 Stone cells of <i>Musta</i></p>	 <p>Fig.3 Pitted stone cells of <i>Vacha</i></p>
 <p>Fig.4 Group of fibers of <i>Musta</i></p>	 <p>Fig.5 Starch grain of <i>Ativisha</i></p>	 <p>Fig.6 Scleroid of <i>Haritaki</i></p>
 <p>Fig.7 Brown content of <i>Devadaru</i></p>	 <p>Fig.8 Prismatic crystal of <i>Devadaru</i></p>	 <p>Fig.9 Trichome of <i>Haritaki</i></p>
 <p>Fig.10 Scleroid of <i>Vacha</i></p>	 <p>Fig.11 The olioeresin content of <i>Shunthi</i></p>	 <p>Fig.12 Fragment of an annular vessel of <i>Ativisha</i></p>



DISCUSSIONS AND CONCLUSION:

The constituents *VachadiVati* such as *Vacha*(*Acorus calamus*Linn.), *Musta*(*Cyperus rotundus*Linn.), *Devadaru*(*Cedrus deodara*Roxb.), *Shunthi*(*Zingiber officinale*Roxb.), *Ativisha*(*Aconitum heterophyllum*Wall.), *Haritaki*(*Terminalia chebula*Retz.) are endowed with various biological properties and hence the polyherbal preparation prepared from these ingredients will have combined goodness of all the individual herbs. These plants are highly used for fulfilling various disease alignment. This concept is highly recommended for those children who are suffering from overweight/Obesity. The pharmacognostic analysis of *VachadiVati* confirmed the purity and genuinely of the drug. Further study may be carried out on it on the basis of an observation made and results of experimental studies. As pharmacognostical profiles of *VachadiVati* are available and this may be beneficial for future researchers and can be used as a reference standard in the future quality control researchers.

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References:

- ¹Pednekar MS. Association of body mass index with all-cause and cause-specific mortality: Findings from a prospective cohort study in Mumbai (Bombay), India. *Int J Epidemiol* 2008;37:524-35.
- ²Kotian MS. Prevalence and determinants of overweight and obesity among adolescent school children of south Karnataka, India. *Indian J Community Med* 2010;35:176-8.
- ³Stigler MH. Weight-related concerns and weight-control behaviors among overweight adolescents in Delhi, India: A cross-sectional study. *Int J Behav Nutr Phys Act* 2011;8:9.
- ⁴Gupta DK, Shah P, Misra A, Bharadwaj S, Gulati S, Gupta N, *et al.* Secular trends in prevalence of overweight and obesity from 2006 to 2009 in urban Asian Indian adolescents aged 14-17 years. *PLoS One* 2011;6: e17221.
- ⁵Raj M. Dynamics of growth and weight transitions in a pediatric cohort from India. *Nutr J* 2009;8:55.
- ⁶Bharati DR. Correlates of overweight and obesity among school going children of Wardha city, Central India. *Indian J Med Res* 2008;127:539-43.
- ⁷Agarwal A (2015) Childhood Obesity. *J Nutr Disorders Ther* 5: e122. doi:10.4172/2161-0509.1000e122
- ⁸Vagbhata, AstangaHridaya, Arundatta and hemadri commentary, HarishastriParadkara Vaidya (ed.),ChaukhambhaOrientalia publications;2005, Sutrasthana, chapter15/35-36.
- ⁹Sharma PV. *DravyagunaVijyana* Vol. II, ChaukhambhaBharati Academy, Varanasi.
- ¹⁰Gyanendra Pandey. *DravyagunaVijnana* Part II, ChaukhambhaKrishnadas Academy, Varanasi:2004.
- ¹¹Trease and Evans, *Pharmacognosy*, 15th Ed., W.B. Saunders Company Ltd., 1996; 569-570.
- ¹²Wallis TE, *Text book of Pharmacognosy*, 5th Ed., New Delhi: CBS Publishers & Distributors, 2002; 123-132, 210-215.