



## IN VITRO ANTI-OXIDANT ACTIVITY OF SPICES WSR TO AHARAYOGI VARGA AND ITS IMPORTANCE IN DIABETES

S. A. ASHA<sup>1\*</sup> M.B. KAVITA<sup>2</sup> V. BASKARAN<sup>3</sup>

### ABSTRACT:

The food articles are classified into various groups in *Ayurveda* such as group of cereals , group of milk. *Ahara yogi varga* is one among such food groups that includes most of the articles called as spices. The general characters of *aharayogi varga* is *ahara samskarartha* (to change the quality of food), *rochana*(taste enhancer), *deepana* (increases digestive fire), *dourgandha nashana* (removes bad odor), *vata kapha hara* (reduces *vata* and *kapha*). *Prameha* (*madhumeha*/diabetes) is considered under *kaphaja roga* and *santarpana janya* where in *Agni* is impaired, and is due to improper digestion process. Irregular metabolism leads to disorders like diabetes, obesity, hormonal disorders. The aim in such health conditions is to assure proper metabolism. The drugs in *aharayogi* group are said to bring changes in food qualities for required benefits. Turmeric, pepper, ginger, cumin, carrom, rock salt, asafetida, sesame oil etc are included in *aharayogi varga*. Spices are the dried part of plants and are biologically active compounds, enhance flavor, improve their organoleptic properties. They are widely used as preservatives and medicine. Flavonoids, Phenolic compounds, Lignans, Sulfur-containing compounds, Tannins, Alkaloids, Vitamins, Essential oils have been found in spices. Due to hyperglycemia, free radicals are formed that causes oxidative stress. It damages the cells leading to fast progression in pathology of diabetes. An invitro study done to know the antioxidant activity of spices with regard to flavonoids, radical scavenging activity. The sample with spices showed presence of higher antioxidants compared to the one without the spice. Food that is customized as per literatures when added to routine helps to scavenge free radicals that are formed. Diabetic complications can be preventable when there are controlled sugar levels.

**Keywords:** *Aharayogi varga*, spices, Diabetes, Flavonoids, Radical scavenging activity

<sup>1\*</sup>Asst. Professor, Dept. of P.G. Studies in Swasthavritta, SJGAMC, Koppal

<sup>2</sup>Professor and Head, Dept. of P.G. Studies in Swasthavritta, SDMCAH, Hassan

<sup>3</sup>Rtd. Chief Scientist, Dept. of Biochemistry, CSIR-CFTRI, Mysore

Corresponding Email id: [asha57dsa@gmail.com](mailto:asha57dsa@gmail.com) Access this article online: [www.jahm.co.in](http://www.jahm.co.in)

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## 1. INTRODUCTION:

There is an elaborative description of food in *Ayurveda* literatures. Food articles are classified into various categories such as group of cereals, group of pulses, group of vegetables<sup>[1]</sup>. *Aharayogi varga* is one such group wherein the food articles are mostly spices. The general qualities are *rochana*(taste enhancer), *deepana*(increases digestive fire), *dourgandha nashana*(removes bad odor if in the food), reduces *vata* and *kapha*. The required quality in the food can be brought with the addition of any of *ahara yogi dravya* (*ahara samskara*)<sup>[2]</sup>. The description of *pathya* (indicated foods) in treatment of *prameha* has most of the drugs told in *aharayogi varga*. It is the *kaphaja vyadhi* (disorder due to disturbed kapha) and also a *Santarpanajanya vyadhi*(a disease due to over nutrition). Due to the causative factors, there will be *agnimandya* (sluggish digestive fire) and the metabolism in the body is impaired. Most of the drugs in *aharayogi varga* can also seen in the context of treatment of *prameha* and in the

description of *santarpana janya vyadhis*<sup>[3]</sup>. Few drugs were selected from *aharayogi varga* and from the drugs told as *pathya* (consumables) in *santarpana janya vyadhis*, and analyzed for flavonoids and radical scavenging activity. The objective of this study is to know the amount of presence of flavonoids and radical scavenging activity of the selected drugs and to recommend to incorporate in diabetic diet. Most of the beneficial health effects of flavonoids are attributed to their antioxidant and chelating abilities<sup>[4]</sup>. There is growing evidence that excess generation of highly reactive free radicals, largely due to hyperglycemia, causing oxidative stress, which further exacerbates the development and progression of diabetes and its complications. Overproduction and/or insufficient removal of these free radicals result in vascular dysfunction, damage to cellular proteins, membrane lipids and nucleic acids<sup>[5]</sup> activities

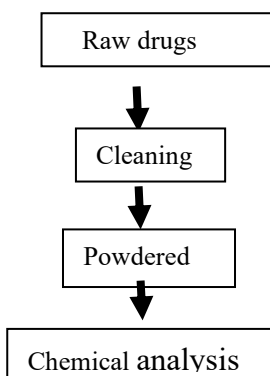
## 2. Materials and Methods

Work was conducted at Council of Scientific and Industrial Research- Central Food

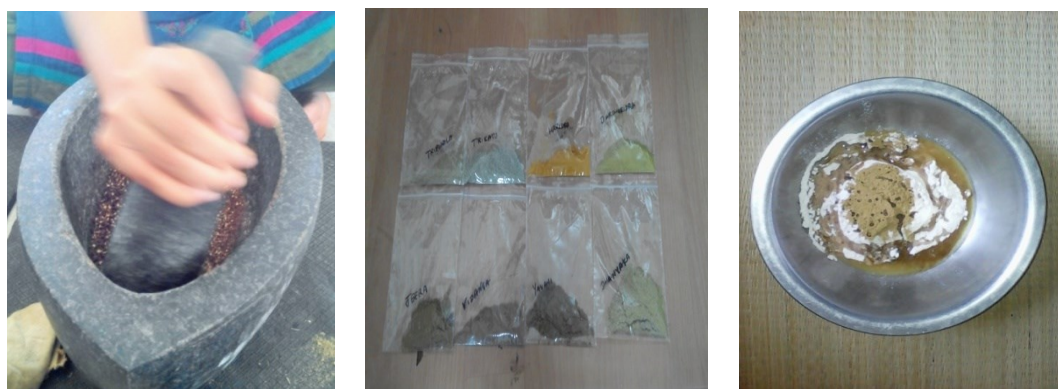
Technological Research Institute (CSIR- CFTRI), Mysore. All chemicals used were purchased from Sisco Laboratories, Mumbai, India.

The raw drugs such as barley as a base and *aharayogi dravya*/spices such as turmeric, pepper, ginger, cumin, carrom, rock salt, asafetida, sesameoil were collected, cleaned manually, powdered and extracts are prepared.

As per AOAC 2010 methods sample extracts were prepared. The sample has the base of barley flour. Sample A (n=3) is barley without *Aharayogi dravya*/spices and Sample B with *Aharayogi dravya*/ spices [Samples(n=3)] are subjected to in-vitro analysis for flavoinoids against standard Catechin was determined spectrophotometrically. Radical scavenging activity analysis for samples were done by DPPH method (Duh and Yen, 1997)



**Figure 1: Flow-chart showing the preparation of the samples with (B) or without aharayogidravaya/spices(A)**



**Figure 2: Pictures of sample preparation**

**3.Results:**

Diagram 1 shows total flavonoids is more in sample B (1.299mg/gm) than in sample

A(0.338mg/g).Diagram 2 shows radical scavenging activity is more in Sample B (95.72%) than in Sample A (28.64%)

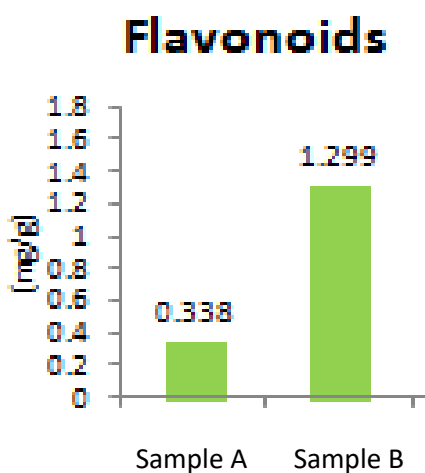


Diagram 1: Total flavonoids

**Radical scavenging activity**

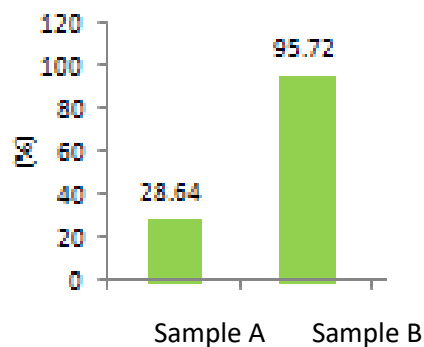


Diagram 2: Radical Scavenging activity

**4. DISCUSSION:**

**FLAVONOIDS:**

Flavonoids was high in Sample B (1.299mg/100g) than in sample A(0.338mg/100g). Addition of *aharayogi dravya* *aharayogi* or spices which were mainly of *tikta, kashaya rasa* contributed to the increased level of flavonoid content in sample B forms than in the samples without *aharayogi varga dravya*. Flavonoids are naturally occurring phenolic antioxidants that are present in the human diet, reported to possess

a variety of biological activities, including antiallergic, anti inflammatory, antiviral, anti proliferative, and anti carcinogenic activities<sup>[6]</sup>. *Santarpana janya vyadhi* like *prameha, atistoulya, kushta, kamala, shopha* can be intervened with addition of spices in the diet.

**RADICAL SCAVENGING ACTIVITY:**

Radical scavenging activity was higher in the sample B(95.72%)than in sample A(28.64%). *Aharayogi dravya* added contributed to the highest percentage of Radical scavenging activity in sample B. Free radicals induce oxidative damage to biomolecules. This damage causes atherosclerosis, aging, cancer,

several other diseases. Dietary food contains wide variety of free radical-scavenging antioxidants such as flavonoids, ascorbic acid<sup>[7]</sup>. Most of the *aharayogi dravya* added were having *tikta, kashaya rasa, kapha-vata shamaka, agni deepana* property. Hence sample with spices or *aharayogi dravya* is advised in *santarpana janya vyadhi* like *prameha, aruchi, sthauilya, hridroga, kamala, kushta*.

*Prameha* ( Diabetes) is considered under *kaphaja roga* and *santarpana janya* where in agni has been hampered, and is due to impaired digestion process. Diabetes is due to improper metabolism. Antioxidants are substances that prevent oxidation of other compounds or neutralize free radicals they have the ability to scavenge free radicals and can form complexes with catalytic metal ions rendering them inactive showing significance in therapeutic benefits in T2DM. *Aharayogi varga* not only enhance the flavor, aroma, and color of food but they can also protect people from acute and chronic diseases, due to their high antioxidant activity. It was demonstrated that *dravyas* in *Aharayogi varga* are important sources of natural phenolic antioxidants even higher than that of all the vegetables and some fruits. Hyperglycemia promotes auto-oxidation of glucose to form free radicals. This causes disruption between the vasodilatation

and vasoconstriction leading to endothelial dysfunction and causes damage to the arterial wall vascular smooth muscle cells inflammation. Such metabolic disturbances of diabetes, like hyperlipidemia, hyperinsulinemia, and hyperglycemia, causes "oxidative stress". The drugs in the *Aharayogi varga* have shown potential antioxidant activity when subjected for antioxidant assays. Lifestyle disorders like Diabetes are increasing alarmingly. The major concern is high fat diet and high glycemic indexed food are being consumed more. There is a need for use of such spices in the food precisely.

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#### **5. REFERENCES:**

- 1.Yadavji Trikamji(editor). Charaka Samhita of Charaka, Sutrasthna, chapter 27, verse no.7,2<sup>nd</sup> edition, Varanasi;Chowkamba prakashana;2011:153
2. Yadavji Trikamji(editor). Charaka Samhita of Charaka, Sutrasthna, chapter 27, verse no.309,2<sup>nd</sup> edition, Varanasi;Chowkamba prakashana;2011:171
3. . Yadavji Trikamji(editor). Charaka Samhita of Charaka, Sutrasthna, chapter 23, verse no.21,2<sup>nd</sup> edition, Varanasi;Chowkamba prakashana;2011:121

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4. Hein K E, Tagliaferro A R. FLAVONOID ANTIOXIDANTS: CHEMISTRY, METABOLISM AND STRUCTURE-ACTIVITY RELATIONSHIPS. JNB[Internet].

2002April15[Cited2023April17]; Available from:<https://www.sciencedirect.com/science/article/pii/S0955286302002085>

5. Johansen J S, Harris K A. OXIDATIVE STRESS AND THE USE OFANTIOXIDANTS IN DIABETES: LINKING BASIC SCIENCE TO CLINICAL PRACTICE.

BMC[internet]2005April[Cited 2023April 29]; Available from

<https://cardiab.biomedcentral.com/articles/10.1186/1475-2840-4-5>

6.Yashin A, Xia X. ANTIOXIDANT ACTIVITY OF SPICES AND THEIR IMPACT ON HUMAN HEALTH: A REVIEW. NLM[Internet].2017 September6[Cited 2020September27];6(3). Available

from:<https://pubmed.ncbi.nlm.nih.gov/28914764>

7.Bajaj S, Khan A. (2012) ANTIOXIDANTS AND DIABETES, NLM[Internet]. 2012 December16[Cited2020September27. Available from: <https://pubmed.ncbi.nlm.nih.gov/23565396>

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