



Evaluation of Antioxidant Potential and Total Phenol Content Of Amruth Jeevan Rasayan: A Herbomineral Ayurvedic Formulation

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ABSTRACT

Amruth Jeevan Rasayan is comprising of the purely herbal 'avaleha' / herbal jam named Amruth Jeevan Rasayan Avaleha along with the mineral-rich Amruth Jeevan Rasayan Tablets, formulated following the principles of treating aging and age-associated diseases. Being an anti aging drug, Amruth Jeevan Rasayan must have antioxidants and free radical scavenging activity to minimize free radical-induced damage, which is a key cause of aging. The methanolic extract of Amruth Jeevan Rasayan was evaluated in vitro for total phenolic and free radical scavenging activity. The total phenolic content was measured using Folin-ciocalteu reagent against gallic acid. Free radical scavenging activity was measured by 2,2-diphenyl-1-picryl hydroxyl (DPPH) and 2,2'-Azinobis(3-ethylbenzothiazoline-6-sulfonic acid) di ammonium salt (ABTS) assay. The studies showed that Amruth Jeevan Rasayan possesses antioxidant activity. The results of this study suggest that the antioxidant and free radical scavenging activity of Amruth Jeevan Rasayan may explain its Rasayan effect and justify its use as a medicine for age associated diseases.

Keywords: Antioxidant, Phytochemicals, Amruth Jeevan Rasayan, DPPH, and ABTS

1. INTRODUCTION

In living systems, free radicals are generated as part of the body's normal metabolic process, and the free radical chain reactions are usually produced in the mitochondrial respiratory chain, liver mixed function oxidizes, through xanthine oxidize activity, atmospheric pollutants and from transitional metal catalysts, drugs and xenobiotics.^[1] Reactive oxygen species (ROS), besides of their useful role in signal transductions, are also involved in the dispersion of several degenerative diseases like malignant tumors, rheumatic joint inflammation, cataracts, Parkinson's and Alzheimer's disease, hypertension, diabetes, oxidative stress, tissue damages and atherosclerosis.^[2] Oxidative damage to cellular bimolecular such as lipids, proteins and DNA is thought to play a crucial role in the incidence of several chronic diseases.^[3-7]

In addition to antioxidant enzymatic system, there are non-enzymatic bimolecular and proteins in living organisms, which act as antioxidant and free radical scavengers to protect the body from such effects. Food supplementation containing ascorbate, carotenoids, tocopherols, flavonoids and phenols play a significant role in this matter.^[8,9] Flavonoids are a group of polyphenolic compounds found abundantly in the plant kingdom. Interest in the possible health benefits of flavonoids and other polyphenolic compounds has increased in recent years owing to their potent antioxidant and free-radical scavenging activities.^[10-16]

These bioactive natural compounds scavenge the reactive oxygen species and prevent free radicals to cause deterioration. They have the aptitude to scavenge oxygen-nitrogen derived free radicals by donating hydrogen atom or an electron, chelating metal catalysts, activating antioxidant enzymes and inhibiting oxidizes.^[17-19] Based on such a type of incredible results, interest in exploration of bioactive compounds extracted from medicinal plants was increased in recent years to replace the use of synthetic drugs, which were restricted due to side effects. On the other hand, polyphenol, used as natural antioxidants, are gaining importance, due to their health benefits for humans, decreasing the risk of cardiovascular and degenerative diseases by reduction of oxidative stress and counteraction of macromolecular oxidation.^[20,21]

Ayurveda arguably is the oldest medical system in the world, providing innumerable leads to find active and therapeutically useful compounds from plants. The health promoting, disease preventing and rejuvenating approach available in the Indian systems of medicine like 'Ayurveda' is gaining greater attention and popularity in many regions of the world. Medicinal plants constitute the main source of new pharmaceuticals and healthcare products, including medications for ethno veterinary medicine. Rasayan tantra is a unique branch of Ayurveda and the drugs mentioned in this chapter have been described to both cure disease and also promote health.^[22] Rasayan medicines improve the quality of 'Rasa' (plasma) and thus strengthen or promote the health of all tissues of the body.^[23]

Amruth Jeevan Rasayan is a herbomineral product, which composed of the purely herbal jam named Avaleha, along with the mineral-rich Tablets. Amruth Jeevan Rasayan Avaleha contains an ideal group of 26 unique herbs, in a base of Ghee, Honey and Sugar, whereas Amruth Jeevan Rasayan Tablets contain 6 rich herbs and 6 nutritious minerals. Both Avaleha & Tablets belong to the wonderful group of herbal formulations called 'Rasayana'. This combination capable of re-inventing, rejuvenating and strengthening the human body, resisting ailments, preserving comprehensive health, supporting convalescence (regaining of complete health after getting cured from disease) and promoting long-life by countering the debilitating effects of ageing. On this ground, because of being a combination of herbomineral known to have health promoting effects, this study was designed to provide scientific basis to the efficacy of Amruth Jeevan Rasayan mentioned in the texts. The objective of this study was to screen the phytochemicals of its ingredients and to evaluate the total phenol content and antioxidant potential / free radical scavenging activity of methanol extract of Amruth Jeevan Rasayan.

2. MATERIAL AND METHODS

2.1 Plant materials

All ingredients in Amruth Jeevan Rasayan were collected from Thodupuzha, Kerala, India in the month of May and June. The specimens were identified and voucher specimens of plants were deposited in the Herbarium in the Department of Pharmacognosy, Nagarjuna Herbal Concentrates Ltd, Kerala, and India. The different plant materials (Table 1) were cut into small pieces, dried at 40-50°C shade for one week and powdered.

2.2 Preparation of extract

Extraction was performed by 10g of each plant powder/ Amruth Jeevan Rasayan Avaleha was soaked with methanol for 24 hours at room temperature. After filtration the residue was extracted twice in the same conditions. The methanol was completely evaporated at 40°C using a rotary vacuum evaporator. The yield of extract was given in the Table 1.

2.3 Preparation of bhasma/ Amruth Jeevan Rasayan tablet for the test

Bhasma (Calcined form of metals)/ Amruth Jeevan Rasayan tablet were collected and used for the study. Very fine powder of Bhasma were taken and suspended in methanol for the analysis.

2.4 Preliminary Phytochemical Analysis

The various extracts of Amruth Jeevan Rasayan and its ingredients were tested for different phytoconstituents like alkaloids, Flavonoids, Saponins, carbohydrates, Protein, Steroids, Glycosides and Tannins using standard procedures.^[24]

2.5 Determination of Total Polyphenols

The amount of total phenolic contents in extracts was determined by using Folin-Ciocalteu procedure. In this method, the samples (100µg/ml) were introduced into test tubes; 1ml of Folin-Ciocalteu reagent, 2 ml of sodium carbonate (35%) and 2ml of de-ionized water were added. The tubes were mixed and allowed to stand for 30 min. Absorbance at 765 nm was measured using Chemito 2600 UV/visible Spectrophotometer (Nasik, India). The total phenolic content was expressed as gallic acid equivalents (GAE) in milligrams per gram of dry weight (DW). The values were obtained from three different experiments performed in duplication.

2.6 In-vitro Anti-oxidant activity

2.6.1 DPPH radical scavenging activity

The ability of the plant extract to scavenge 1,1-diphenyl-2-picrylhydrazyl (DPPH) free radicals was assessed by the standard method.^[25] The stock solution of extracts were prepared in methanol to achieve the concentration of 1 mg/ml. Dilutions were made to obtain concentrations of 20, 40, 60, 80 and 100µg/ml. Diluted solutions (1ml each) were mixed with 3ml of methanolic solution of DPPH (DPPH, 0.004%). After 30 min of incubation at room temperature, the reduction of the DPPH free radical was measured by reading the absorbance at 517nm using UV-Visible Spectrophotometer. Initially, absorption of blank sample containing the same amount of methanol and DPPH solution was prepared and measured as control. Ascorbic acid was used as standard. The experiment was carried out in triplicate. Percentage inhibition was calculated using equation (1), whilst IC₅₀ values were estimated from the % inhibition versus concentration plot, using a non-linear regression algorithm. The data were presented as mean values ± standard deviation (n = 3).

$$I (\%) = [(A \text{ blank} - A \text{ sample}) / A \text{ blank}] \times 100$$

Where A blank is the absorbance of the control reaction (containing all reagents except the test compound), and A sample is the absorbance of the test compound. The extract concentration providing 50% inhibition (IC₅₀) was calculated from the plot of inhibition (%) against extract concentration. Test was performed in three different experiments with duplication. Ascorbic acid standard was used for comparison.

2.6.2 Determination of Antioxidant Potential (ABTS assay)

The total radical scavenging capacity based on the ability of a compound to scavenge the stable 2,2'-azinobis-(3-ethyl-benzothiazoline-6-sulfonic acid) (ABTS) radical in 6 min. For the total antioxidant assay, ABTS was dissolved in de-ionized water to a 7 M concentration. The ABTS radical cation (ABTS⁺) was produced by reacting ABTS stock solution with a 2.45mM potassium persulfate (final concentration) and incubating the solution in the dark at room temperature for 12–16 h before use. The radical stock solution

was diluted with a 5mM solution of phosphate-buffered saline (PBS; pH 7.4) to obtain a spectrophotometric absorbance value at 734nm.

Ascorbic acid standard was prepared in de-ionised water over the range 2-10µg/ml. Extracts were prepared in different concentrations (20-100µg/ml) in methanol. To 40µl of extract/standard solution, 1.96 ml of ABTS+ solution was added and the tubes were kept in dark for 6 min and read at 734 nm using Chemito 2600 UV/visible Spectrophotometer (Nasik, India). This was compared to a control where 40µl of the solvent was added to 1.96 ml of ABTS+ solution. The assay was performed in three different experiments with duplication. Antioxidant activity was expressed as the % of ABTS radical reduction. Radical scavenging activity was expressed as the inhibition percentage and was calculated as % radical scavenging activity = [(control OD - sample OD)/control OD] × 100. Extract concentration providing 50% inhibition (IC50) was calculated from the plot of inhibition (%) against extract concentration.

3.RESULT AND DISCUSSION

3.1 Photochemical screening of ingredients of Amruth Jeevan Rasayan

Thousands of diverse natural products are synthesized by plants and many of these are involved in plant defense. The phytochemical diversity of antioxidant compounds include terpenoids, saponins, phenolics and phenyl propanoids, alkaloids, glucosinolates and also elemental sulphur, the sole inorganic compound [26]. The curative properties of medicinal plants are perhaps due to the presence of various secondary metabolites such as alkaloids, flavonoids, glycosides, phenols, saponins, sterols etc. The non-nutrient plant chemical compounds or bioactive components are often referred to as phytochemicals ('phyto-' from Greek - *phyto* meaning 'plant') or phytoconstituents. [27, 28]

This study has revealed the presence of phytochemicals considered as active medicinal chemical constituents. Many of phytochemicals such as alkaloids, saponins, carbohydrates, glycosides etc were present in *Withania somnifera*, *Zingiber officinalis*, *Terminalia chebula*, *Terminalia bellerica* and *Eclipta alba*. Almost all plants contain alkaloids. Important medicinal phytochemicals such as alkaloids, carbohydrates, flavonoids, Tannins, Glycosides, Protein, Saponins and Steroids were present in many samples. The result of the phytochemical analysis shows that the medicinal plants were rich in at least one of alkaloids, flavonoids, terpenoids, and sugars. Phytochemicals have been isolated and characterized from fruits such as grapes and apples, vegetables such as broccoli and onion, spices such as turmeric, beverages such as green tea and red wine, as well as many other sources. [29] The results of preliminary phytochemical analysis are shown in Table III.

3.2 Total phenol content of Amruth Jeevan Rasayan and its ingredients

The total phenolic contents of the extracts using the Folin-Ciocalteu's reagent is expressed in terms of gallic acid equivalent (the standard curve equation: $y = 7.026x - 0.0191$, $r^2 = 0.999$). The values obtained for the concentration of total phenols are expressed as mg of GA/g of extract (Table IV). The amount of total polyphenolics varied widely in medicinal plant materials and ranged from 84.77 to 695.4mg GAE per gram of dry weight (Table IV). A very high amount of total polyphenolic contents (695.4 mg GAE/g extract) was found in *Terminalia chebula* fruit pulp. The fruit pulp extract of *Terminalia bellerica* and *Emblia officinalis* had next highest amount of polyphenolic contents (677.01 and 592.81 mg GAE/g extract). *Holostemma adakodien*, *Piper nigrum*, *Withania somnifera*, *Curculigo orchoides*, *Glycyrrhiza glabra*, *Mucuna pruriens* contain more than 200 mg GAE/g extract. Earlier, a wide variation was observed on total phenolic content in different aromatic and medicinal plants were 6.80-32.10 mg gallic acid equivalents per g dry weight basis [30]. The other medicinal plants had the polyphenolic contents below 100 mg GAE/g extract. The *Vitis vinifera* fruit found with the least amount of polyphenolic contents (84.77 mg GAE/g extract). Amruth Jeevan Rasayan Avaleha and Amruth Jeevan Rasayan Tablets contain the total phenol 93.10, 31.35 mg

GAE/g extract respectively. They also serve in plant defense mechanisms to counteract reactive oxygen species (ROS) in order to survive and prevent molecular damage and damage by microorganisms, insects, and herbivores.^[31]

3.3 Antioxidant property

The 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical is a stable radical with a maximum absorption at 517 nm that can readily undergo reduction by an antioxidant. Because of the ease and convenience of this reaction it now has widespread use in the free radical-scavenging activity assessment^[32]. The methanolic extracts of Amruth Jeevan Rasayan and its ingredients were found to possess concentration dependent scavenging activity on DPPH and ABTS radicals and the results were given in table IV. The mean IC₅₀ values for DPPH can show that fruit pulp of *Terminalia chebula*, *Terminalia bellirica* and *Emblca officinalis* have good scavenging activity than vitamin C ie 3.82, 3.69 and 4.26 µg/ml instead of this the ascorbic acid have 8.69µg/ml. *Zingiber officinale* also shows a good free radical scavenging activity of 19.41µg/ml. *Curculigo orchioides*, *Mucuna pruriens*, *Withania somnifera*, *Piper nigrum* and *Glycyrrhiza glabra* were shows more than 100 µg/ml. *Asparagus racemosus* (rhizome) having very low free radical scavenging activity as indicated by 579.29µg/ml of IC 50 value in DPPH assay. AJRA and AJRT also showed 43.46±2.54 and 42.46±2.54 µg/ml. Calcined forms of bhasmam also showed a very good radical scavenging activity, ie Sankhu bhasmam, Swarna bhasmam, Abhra bhasmam, Annabhedhi sindhooram and Kanmada bhasmam showed 44.61±0.12, 44.76±0.12, 45.89±1.331, 48.49±0.85 and 45.84±0.48 µg/ml respectively. These results by ABTS assay evidence that *Terminalia chebula*, *Terminalia bellirica* and *Emblca officinalis* were also found to have a very good scavenging activity.

All bhasmams also shows very good IC₅₀ values i.e below 50µg/ml for DPPH and below 100µg/ml in ATS. Other ingredients like ghee, sugar and honey were also showed god IC 50 values. Amruth Jeevan Rasayan Tablets and Amruth Jeevan Rasayan Avaleha also had the IC 50 values of 40.03 and 38.85µg/ml.

Many synthetic drugs are said to protect against oxidative damage but they have adverse side effects. An alternative solution to the problem is to consume natural antioxidants from food supplements and traditional medicines. Recently, many natural antioxidants have been isolated from different plant materials. Amruth Jeevan Rasayan is a formulation developed by R&D of NHCL, which is said to have properties to work against age-related deterioration in the body. Amruth Jeevan Rasayan is a herbomineral preparation composed of *A. racemosus*,^[33] *B. diffusa*,^[34] *T. chebula*,^[35] *T. cordifolia*,^[36] *E. officinalis*,^[37] *W. somniferra*^[38] and Swarna bhasma,^[39] ie, are all well known to exert immunomodulator, antioxidant, and free radical scavenging activities, as individually identified plants. When all the ingredients are made into a single formulation, their pharmacodynamic actions may differ from their individual effects. The hypothesis of this study was that all the ingredients may act synergistically to have potent phytochemical combination by which more antioxidant activity could be shown than the individual ingredients had.

4. Conclusion

From the results obtained in this study, It can be concluded that methanol extract of Amruth Jeevan Rasayan and its ingredients, which composed of large amounts of phenol compounds, exhibits high antioxidant and free radical scavenging activities. *In vitro* assays indicate that both Amruth Jeevan Rasayan Avaleha & Tablets belong to the wonderful group of herbal formulations called 'Rasayana', which are capable of completely re-inventing, rejuvenating and strengthening the human body, resisting ailments, preserving comprehensive health, supporting convalescence (regaining of complete health after getting cured from disease) and promoting long-life by countering the debilitating effects of ageing. They help the body cells to shell out unnecessary chemicals accumulated as a byproduct of natural ageing and oxidation which might be helpful in preventing the progress of numerous oxidative stresses which trigger at various age related diseases and in retarding aging and preventing premature aging. However, the components responsible for the antioxidant activity are currently unclear.

Therefore, further investigation is needed to isolate and identify the antioxidant compounds present in the extract of Amruth Jeevan Rasayan.

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Table I:- Malayalam name botanical name, parts used and of yield of extract of ingredients of Amruth Jeevan Rasayan Avaleha

Malayalam Name	Botanical Name	Parts used	Yield of extract in %
Adapathiyan	<i>Holostemma adakodien</i>	Rhizhome	8.81
Amukkuram	<i>Withania somnifera</i>	Root	7.4
Chukku	<i>Zingiber officinala</i>	Rhizhome	10.47
Iarttimadhuram	<i>Glycyrrhiza glabra</i>	Root	17.23
Idavakam	<i>Microstylis muscifera</i>	Root tuber	5.22
Jeevakam	<i>Maxalis acuminata</i>	Root tuber	38.73
Kadukka	<i>Terminalia chebula</i>	Fruit pulp	57.06
Kakoli	<i>Lilium polyphyllum</i>	Root	5.32
Kattupayar	<i>Atylosia goinsis</i>	Whole plant	3.62
Kattuzhunnu	<i>Phaseolus trilobus</i>	Whole plant	4.7
Kayyunnyam	<i>Eclipta alba</i>	Whole plant	4.22
Koval	<i>Coccinia grandis</i>	Stem	2.07
Ksheerakakoli	<i>Fritillaria roylei</i>	Root	37.23
Kumkumapoovu	<i>Crocus sativus</i>	stamen	1.07
Kurumulaku	<i>Piper nigrum</i>	Seed	13.96
Mahaamedda	<i>Polygonatum verticillatum</i>	Root tuber	7.2
Meda	<i>Polygonatum cirrhifolium</i>	Root tuber	5.12
Munthiri	<i>Vitis vinifera</i>	Fruit	79.6
Naykurana	<i>Mucuna pruriens</i>	Seed	7.15
Nellikka	<i>Emblica officinalis</i>	Fruit pulp	32.73
Nliapanna	<i>Curculigo orchioides</i>	Rhizhome	5.32
Palmuthakku	<i>Lpomoea paniculata</i>	Rhizhome	5.12
Sathavary	<i>Asparagus racemosus</i>	Rhizhome	39.73
Thaannikka	<i>Terminalia bellirica</i>	Fruit pulp	28.04
Thazhuthama	<i>Boerhavia diffusa</i>	Root	3.91
Thippali	<i>Piper longum</i>	Seed	26.06
Amruth jeevan rasayan	-	-	64.7

Table II:- Malayalam name botanical name, parts used and of yield of extract of ingredients of Amruth Jeevan Rasayan Tablets

Malayalam Name	Botanical Name/ Chemical name	Used as
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Amukkuram	<i>Withania somnifera</i>	Root
Kadukka	<i>Terminalia chebula</i>	Fruit pulp
Naykurana	<i>Mucuna pruriens</i>	Seed
Nellikka	<i>Emblica officinalis</i>	Fruit pulp
Thaannikka	<i>Terminalia bellirica</i>	Fruit pulp
Abhra bhasmam	Calcined Mica (ferrus silicate and aluminium)	Bhasmam
Annabhedi sindhooram	Calcined Ferri Sulphas (ferric oxide)	Bhasmam
Kanmada bhasmam	Calcined Asphaltum (potassium nitrate)	Bhasmam
Sankhu bhasmam	Calcined Conch (calcium carbonate calx)	Bhasmam
Swarna bhasmam	Calcined Aurum (gold)	Bhasmam

Table III:- Preliminary phytochemical screening of ingredients in Amruth Jeevan Rasayan medicinal plant species

Botanical Name	Alkaloids	Flavonoids	Saponins	carbohydrates	Protein	Steroids	Glycosides	Tannins
<i>Asparagus racemosus</i>	+	+	-	-	-	-	-	-
<i>Atylosia goinsis</i>	+	-	-	+	+	+	+	-
<i>Boerhavia diffusa</i>	+	+	-	-	-	+	-	-
<i>Coccinia grandis</i>	+	+	-	-	-	+	-	-
<i>Crocus sativus</i>	+	+	-	+	+	+	-	-
<i>Curculigo orchioides</i>	+	+	-	+	-	-	+	-
<i>Eclipta alba</i>	+	+	-	+	+	+	+	-
<i>Emblica officinalis</i>	+	-	+	+	-	-	+	+
<i>Fritillaria roylei</i>	+	+	-	-	-	-	-	-
<i>Glycyrrhiza glabra</i>	+	+	-	+	-	+	+	+
<i>Holostemma adakodien</i>	+	-	-	+	-	+	+	-
<i>Lilium polyphyllum</i>	+	-	-	-	-	-	-	-
<i>Lpomoea paniculata</i>	+	-	-	-	-	-	-	-
<i>Maxalis acuminata</i>	+	+	-	-	-	-	-	-
<i>Microstylis muscifera</i>	+	-	-	-	-	-	-	-
<i>Mucuna pruriens</i>	+	-	+	+	-	+	-	-
<i>Phaseolus trilobus</i>	+	-	-	+	+	+	+	+
<i>Piper longum</i>	+	+	-	+	+	-	-	-
<i>Polygonatum cirrhifolium</i>	+	+	-	+	-	-	+	-
<i>Polygonatum verticillatum</i>	+	-	+	+	+	+	+	-
<i>Terminalia bellirica</i>	+	-	+	+	-	+	+	+
<i>Terminalia chebula</i>	+	-	+	+	-	+	+	+
<i>Vitis vinifera</i>	+	-	-	+	-	+	-	-
<i>Withania somnifera</i>	+	-	+	+	+	+	+	-
<i>Zingiber officinala</i>	+	+	-	+	+	+	+	-

Table IV:- Free radical scavenging activity (DPPH and ABTS) and total phenol cont of Amrujeevan rasayan and its ingredients

Botanical Name	DPPH radical scavenging assay (IC ₅₀)(µg/ml)	ABTS radical scavenging assay (IC ₅₀) (µg/ml)	Total phenol(mg of gallic acid equivalents/g of dry weight extract)
Ascorbic acid	8.69±1.318	8.85± 3.32	-
<i>Asparagus racemosus</i>	279.29±6.62	92.42±4.45	197.70 ± 2.68
<i>Atylosia goinsis</i>	207.26±2.29	79.11±3.52	189.94 ± 1.78
<i>Boerhavia diffusa</i>	239.74±2.20	43.21±3.32	128.73 ± 2.43
<i>Coccinia grandis</i>	229.17±3.69	46.90±2.38	109.77 ± 6.50
<i>Crocus sativus</i>	519.15±5.29	57.20±3.98	162.06 ± 1.38
<i>Curculigo orchioides</i>	43.40±2.15	61.27±3.41	271.55 ±3.98
<i>Eclipta alba</i>	148.64±2.12	49.45±3.98	190.51 ± 1.78
<i>Emblica officinalis</i>	4.26±1.06	5.20± 3.69	592.81 ±6.86
<i>Fritillaria roylei</i>	239.29±3.62	90.42±3.45	175.70 ± 3.68
<i>Glycyrrhiza glabra</i>	100.68±1.61	37.96±1.25	276.72 ± 10.15
<i>Holostemma adakodien</i>	173.98±1.91	121.95±4.95	216.37±2.31
<i>Lilium polyphyllum</i>	205.70±3.21	55.67±4.35	135.20± 4.68
<i>Lpomoea paniculata</i>	216.07±4.41	45.87±3.15	125.28± 5.68
<i>Maxalis acuminata</i>	179.29±6.62	91.42±4.45	187.70 ± 2.68
<i>Microstylis muscifera</i>	200.27±2.21	48.77±3.22	115.38± 4.78
<i>Mucuna pruriens</i>	45.1±2.15	40.65±2.15	414.94 ±3.87
<i>Phaseolus trilobus</i>	227.68±2.18	50.96±3.16	197.98 ± 2.23
<i>Piper longum</i>	229.32±6.52	78.24±3.91	110.05 ± 10.97
<i>Polygonatum cirrhifolium</i>	43.40±2.15	61.27±3.41	271.55 ±3.98
<i>Piper nigrum</i>	99.43±2.15	49.70±2.91	267.24 ± 3.98
<i>Polygonatum verticillatum</i>	70.20±3.59	17.50± 2.91	209.25 ±5.90
<i>Terminalia bellirica</i>	3.82±0.20	5.911±2.18	677.01 ±6.81

<i>Terminalia chebula</i>	3.69±0.43	4.591± 2.49	695.40 ± 5.93
<i>Vitis vinifera</i>	202.02 ±5.50	79.77±3.45	84.77 ± 2.39
<i>Withania somnifera</i>	78.20±4.59	7.53± 3.91	269.25 ±6.90
<i>Zingiber officinala</i>	19.41±7.42	5.85±2.75	123.56 ±2.438
Abhra bhasmam	45.89±1.331	193.05±2.29	-
Annabhedi sindhooram	48.49±0.85	69.73±4.51	-
Kanmada bhasmam	45.84±0.48	39.71±1.28	-
Sankhu bhasmam	44.61±0.12	189.39±2.29	-
Swarna bhasmam	44.76±0.12	39.68±1.24	-
Sugar	107.69±1.62	73.31±4.82	-
Ghee	201.95±2.65	72.25±4.23	-
Honey	254.58±2.74	41.32±3.81	-
<i>Amruth jeevan Tablet</i>	42.46±2.54	40.03±2.18	-
<i>Amruth jeevan rasayan</i>	43.46±2.54	38.85±1.34	31.35 ± 1.58