IJPPR
INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals
ISSN 2349-7203
HUMAN

Human Journals
Review Article
April 2019 Vol.:15, Issue:1

Science behind the Siddhar's with the Research Evidences of Kayakarpam (Antioxidant Property) in Siddha Formulations – A Current Status

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ISSN 2349-7203
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Submission: 23 March 2019
Accepted: 28 March 2019
Published: 30 April 2019

www.ijppr.humanjournals.com

Keywords: *Kayakarpam,* Antioxidant, *Siddha, Siddha* formulations, *Chooranam, Nei, Mathirai, Vadagam, Kudineer, Dravagam, Chendooram, Parpam, Karpam, Pathangam.*

ABSTRACT

Herbal plants play an important role in the field of health care of the people. Medicinal plants are the natural gifted by God because it contains innumerable bioactive substances which are responsible for treating various diseases. Thus the herbal medicines form a backbone of siddha system of medicine. Thus this system of medicine was founded by the great spiritual scientists called Siddhars, who believed the art of immortalizing the corporeal human body. The pharmacology of siddha system of medicine was enriched with the preparation of flora, fauna, and mineral sources. The main hallmark of this system is due to the presence of antioxidant *(kayakarpam)* in their medicinal preparation, which is attained through *Karpavizhtham* which means medicines and *Karpayogam* which means the regimens of life. *Kayakarpam* which is present in the medicinal preparation plays a major role against free radicals which is responsible for various diseases such as ageing process, cancer *etc*. Thus this review article will give more information about the siddha formulations with its antioxidant activity. Thus this review compile the research evidences of *Kayakarpam* (antioxidant) effect of *Chooranam, Nei, Mathirai, Vadagam, Kudineer, Dravagam, Chendooram, Parpam, Karpam, Pathangam.*

INTRODUCTION:

"Natural forces within us are the true healers of disease". -Hippocrates

Siddha system is one of the most effective medical system in the world with minimal side effects. Herbal plants play a major role in Siddha medicinal preparations[1].

It is the pioneer of all other medical system which was practiced in India. There were so many medicinal formulations were prescribed by the ancient Siddhars. Unique nature of the prescribing medicines by this system showed special attention throughout worldwide for deep research in drugs and also for the nature of reverse pharmacology. The pharmacology of siddha system of medicine was enriched with the preparation of flora, fauna, and mineral sources [2].

Plants have a long history in the field of medicine, food, and for daily requirements [3].

In human body, the oxidative stress was induced by generation of free radicals and cause cell damage as a result of it causes many diseases [4].

Cell damage may be caused by the production free radicals which is responsible for the major contributor in the aging process, then also involved in causing degenerative diseases such as cancer, stress, cardiovascular disease, cataract, liver diseases, rheumatoid arthritis, immune system declination, brain dysfunction, inflammation, diabetes mellitus [5].

Antioxidant *(Kayakarpam)* is a molecule which is capable to slow down the process of oxidation or preventing the process of oxidation of other molecules. Free radicals are formed during the oxidative stress that damages the cell, these free radicals are the types of reactive oxygen species (ROS), they are responsible for destroying the normal healthy cells in our body and finally, it affects the normal physiology of the human body [6].

Kayakarpam is an elixir science with its uniqueness. The role and effect of *Kayakarpam* were mentioned in various siddha literatures. The term *Kayam* means body *Karpam* means stone. In this current modern era there were innumerable new drugs were validated day by day in order to empower the health systems. Thus this review compile the research evidences of *Kayakarpam* (antioxidant) effect of *Chooranam, Nei, Mathirai, Vadagam, Kudineer, Dravagam, Chendooram, Parpam, Karpam, Pathangam.*

"Each and every plant, a magnificent creation of nature, has magnetical power of healing.

-Bible.

TABLE NO 1: SIDDHA FORMULATIONS WITH ITS ACTIVITY

S. NO	SIDDHA FORMULATIONS	ACTIVITY
1.	PARUTHI CHOORANAM (*PC)*	ANTIOXIDANT ACTIVITY
2.	*SIRINGIPAERATHI CHOORANAM (SPC)*	ANTIOXIDANT ACTIVITY
3.	*NAGARASINGADHI CHOORANAM* (*NSC)*	ANTIOXIDANT ACTIVITY
4.	*SANDHANATHY CHOORANAM* (*SC)*	ANTIOXIDANT ACTIVITY
5.	*NILAPANAIKIZHANGU CHOORANAM(NPKC)*	ANTIOXIDANT ACTIVITY
6.	*TRIPHALA CHURNAM*	ANTIOXIDANT ACTIVITY
7.	*TRIKADUKU CHURNAM*	ANTIOXIDANT ACTIVITY
8.	*AMUKKARA CHOORNAM*	ANTIOXIDANT ACTIVITY
9.	*ELADI CHURNAM*	ANTIOXIDANT ACTIVITY
10.	*VENTHAMARAIYATHI CHOORANAM (VTC)*	ANTIOXIDANT ACTIVITY
11.	*ELATHY URUNDAI(EU)*	ANTIOXIDANT ACTIVITY
12.	*LINGAMATHIRAI (LM)*	ANTIOXIDANT ACTIVITY
13.	*SAMBIRANI POO KULIGAI(SPK)*	ANTIOXIDANT ACTIVITY
14.	*KADUKKAI VADAGAM (KV)*	ANTIOXIDANT ACTIVITY
15.	AAVARAI KUDINEER (*AK)*	ANTIOXIDANT ACTIVITY
16.	*VALLARAI NEI (VN)*	ANTIOXIDANT ACTIVITY
17.	*SANJEEVI THEENEER (ST)*	ANTIOXIDANT ACTIVITY
18.	*DHASALAVANA DHRAVAGAM (DLD)*	ANTIOXIDANT ACTIVITY
19.	*NAMACHIVAYA CHENDOORAM (NMC)*	ANTIOXIDANT ACTIVITY
20.	*GANDHAGA CHENDOORAM* (*GC)*	ANTIOXIDANT ACTIVITY
21.	*ASHTABAIRAVACHENDURAM (ABC):*	ANTIOXIDANT ACTIVITY
22.	RASA CHENDHURAM *(RCM):*	ANTIOXIDANT ACTIVITY
23.	*BHRAMASTHIRAM (BA)*	ANTIOXIDANT ACTIVITY
24.	*RASA PARPAM (RP)*	ANTIOXIDANT ACTIVITY
25.	*KARISALAI KARPAM (KK)*	ANTIOXIDANT ACTIVITY
26.	*IRUNELLI KARPAM (INK)*	ANTIOXIDANT ACTIVITY

PARUTHI CHOORANAM (*PC*):

PREPARATION OF *PARUTHI CHOORANAM*:

Paruthi chooranam (Gossypium herbaceum) dry leaves were finely powdered and triturated without adding water. Then it was collected and stored in an airtight container.

THE ANTIOXIDANT PROPERTY:

The study showed that the Siddha formulation *PC* showed the significant percentage of reduction about 81.23% on ABTS radicals scavenging activity, followed by 72.43% of metal chelating activity, 77.48 % of activity observed in LPO assay followed by percentage inhibition at the range of 73.49 % in superoxide radical scavenging assay, the NO radical scavenging activity of PC showed the ranges from 22.15 to 79.23%. Thus the *Paruthi chooranam PC* showed a better antioxidant property [7].

SIRINGIPAERATHI CHOORANAM (SPC):

PREPARATION OF *SIRINGIPAERATHI CHOORANAM:*

In order to obtain the purified form of ginger, the upper skin of ginger was peeled off and then sliced into small pieces. The sliced pieces were dried in sunshade for two days. After complete drying 560 grams of dried ginger was taken and fried well in ghee and then powered. 50.4 grams of Purified *Pepper,* 33.6 grams of *Thippili*, 16.8 grams of *Thipplimoolam*, 42 grams of *Kodiveli-ver*, 35 grams of *Moongil uppu*, *Lavangapathiri*, *Sandhana thool*, *Vilamichu-ver*, *Lavanga Pattai*, *Adhikari*, *Seeragam*, *Kirambu* were taken and powered separately then mixed together with processed ginger powder. Finally, the mixture was ground well which favors the homogenous preparation. Then the mixture powder was sieved through the thin clean white cloth. After that twice the weight of sugar was added to the mixture and again it was groundwell. Finally, the end product was obtained, which was kept in an airtight container and labeled as "*Siringipaerathi Chooranam*" *(SPC).*

THE ANTIOXIDANT ACTIVITY:

The study showed that the *SPC* was determined by using the 2,2-diphenyl 1-2 picrylhydrazyl (DPPH) free radical scavenging assay at the concentration of 1.25 µg/ml, 2.5 µg/ml,5 µg/ml,10 µg/ml and 20 µg/ml using ascorbic acid as standard. The DPPH assay of free radical

scavenging activity of *SPC* showed the highest percentage inhibition of about at 73.91% at 20µg/ml when compare to standard ascorbic acid with 89.62%. Thus the "*Siringipaerathi Chooranam" (SPC)* showed a better antioxidant property [8].

NAGARASINGADHI CHOORANAM (*NSC*)**:**

PREPARATION OF "*NAGARASINGADHI CHOORANAM*" (*NSC*):

The purified ingredients were grounded separately as powder. The powder was sieved through a white cloth and all the powders were mixed well. Purification of Chooranam is done by Milk Steaming Process. It was kept in an airtight container and was labeled as "*Nagarasingadhi Chooranam"* (*NSC).*

ANTIOXIDANT PROPERTY:

This study showed that the *NSC* antioxidant property against DPPH assay as ascorbic acid as standard drug. The study showed the efficacy at the lowest concentration of about 1.25 (µg/ml) showed the test drug 28.11% with standard 40.89 % and highest concentration of antioxidant property showed at the range of about 20 (µg/ml) in test drug 81.71% with standard 89.62%. Thus the "*Nagarasingadhi Chooranam"* (*NSC)* showed a better antioxidant property [9].

***SANDHANATHY CHOORANAM* (*SC*):**

ANTIOXIDANT ACTIVITY:

This study showed that the *SC* antioxidant property against DPPH assay as ascorbic acid as standard drug. The study showed the efficacy at the lowest concentration of about 1.25 (µg/ml) showed the test drug 27.62% with standard 40.89 % and highest concentration of antioxidant property showed at the range of about 20 (µg/ml) in test drug 82.36% with standard 89.62%. Thus the "*Sandhanathy Chooranam"* (*SC)* showed a better antioxidant property [10].

NILAPANAI KIZHANGU CHOORANAM (NPKC):

THE PREPARATION OF *NILAPANAI KIZHANGU CHOORANAM:*

The ingredients were *Nilapanai kizhangu* (*Curculigo orchioides*), *Nerunjil* (*Tribulus terrestris*), *Nelli vatral* (*Phyllanthus emblica*), *Poonaikaali vidhai* (*Mucuna pruriens*), *Seendhil sarkarai* (*Tinospora cordifolia*), *Mul Ilavam pisin* (*Bombax malabaricum*), *Karkandu* (*Saccharum officinarum*). The drug was purchased from authorized country Raw Drug Store in Chennai. The collected raw materials and plants were identified and authenticated by Botanist and faculties of *Gunapadam* department, Government Siddha Medical College Chennai, Tamilnadu. The Siddha Drug "*Nilapanai Kizhangu Choornam"* was prepared as per the siddha text "*Kannusamy parambaraivaithiyam"*

THE ANTIOXIDANT PROPERTY:

The *NPKC* showed a better antioxidant activity in DPPH, it showed lowest level of efficacy at the range of 1.25(µg/ml) 30.26% with the standard of 40.89% followed by showed the highest efficacy of antioxidant property at the range of 20(µg/ml) 78.66% with the standard 89.62%.. Thus the *NPKC* showed a better antioxidant property [11].

***TRIPHALA CHURNAM, TRIKADUKU CHURNAM, AMUKKARA CHURNAM* AND *ELADI CHURNAM*.**

THE ANTIOXIDANT ACTIVITY:

The DPPH radical scavenging activity of *Triphala churnam***,** *Trikaduku churnam, Amukkara churnam* and *Eladi churnam* showed a better results with the maximum absorption at 515 nm. The Polyherbal formulations showed a dose-dependent antioxidant activity and the IC-50 in the ranges with value of 156, 1171, 2286 and 5067 µg / ml were recorded by *Triphala churnam***,** *Trikaduku churnam, Amukkara churnam* and *Eladi churnam*. Thus the Polyherbal formulations such as *Triphala churnam***,** *Trikaduku churnam, Amukkara churnam* and *Eladi churnam* showed a better antioxidant property [12].

VENTHAMARAIYATHI CHOORANAM (VTC):

PREPARATION OF VENTHAMARAIYATHI CHOORANAM *(VTC):*

All the above-mentioned ingredients were purified and dried in the shade until complete evaporation of the moisture content. It was roasted and powdered and filtered individually (fine process). Then all are thoroughly mixed to make *Venthamaraiyathi Chooranam* and kept in an airtight container. It was labelled as "*Venthamaraiyathi Chooranam" (VTC).*

ANTIOXIDANT ACTIVITY:

This study showed that the *VTC* antioxidant property against DPPH assay as ascorbic acid as standard drug. The study showed the efficacy at the lowest concentration of about 1.25 (µg/ml) showed the test drug 27.62% with standard 40.89% and highest concentration of antioxidant property showed at the range of about 20 (µg/ml) in test drug 82.36 % with standard 89.62%. Thus the "*Venthamaraiyathi Chooranam" (VTC)* showed a better antioxidant property [13].

ELATHY URUNDAI (EU):

PREPARATION OF *ELATHY URUNDAI (EU):*

Elettaria cardamomum, Syzygium aromaticum, Cinnamomum tamala, Cassia auriculata, Tinospora cordifolia, Asparagus racemosus, Nelumbo nucifera, Buttermilk. Purification of ingredients, ingredients were pound into powder, ground with buttermilk, and made into tablets.

ANTIOXIDANT ACTIVITY:

The extract of *EU* showed the highest DPPH scavenging activity (76.57%) at 20µg/ml and the lowest percentage of inhibition (26.21%) at 1.25µg/ml. Ascorbic acid (Standard) showed highest percentage of inhibition (89.62%) at 20µg/ml and the lowest percentage of inhibition (40.89%) at 1.25µg/ml. Thus the "Elathy Urundai*" (Eu)* showed a better antioxidant property [14].

LINGAMATHIRAI (LM):

PREPARATION OF *LINGAMATHIRAI (LM):*

Cinnabar, *Indigofera aspalathoides*, *Aconitum ferox*, all the ingredients were ground and Sealed with silk cloth, then Fried with gingilly oil and then seal is opened subjected to grinding process. Then it is rolled into pills of *Linga mathirai* and obtained final form of *Mathirai.*

ANTIOXIDANT ACTIVITY:

This study showed that the *LM* antioxidant property against DPPH assay as ascorbic acid as standard drug. The study showed the efficacy at the lowest concentration of about 1.25 (µg/ml) showed the test drug 26.21% with standard 40.89% and highest concentration of antioxidant property showed at the range of about 20 (µg/ml) in test drug 76.57% with standard 89.62%. Thus the "*Lingamathirai (LM)"* showed a better antioxidant property[15].

SAMBIRANI POO KULIGAI (SPK):

PREPARATION OF *SAMBIRANI POO KULIGAI (SPK)*

The purified form of *Styrax benzoin* was powdered well and was kept in the small pot. Then a paper was pasted on inner surface of a big mud pot. The big mud pot was kept over the small mud pot and their mouths oppose each other. The gap between their mouths were sieved by a seven layered mud smeared wet cloth and then allowed to dry. Then it was subjected to sublimation process for 12 hours (*4 samam*). After completing the sublimation process let the pot undisturbed to give away heat. Followed by this the seal were opened and the sublimed product was scrapped and collected. *Syzygium aromaticum* and *Felbovinum* are powdered well and sieved through a white cloth. Finely powdered *Syzygium aromaticum* powder and *Felbovinum* powder are added along with the sublimate. Then all these substances are grounded well with *Piper betle* leaf juice for 48 minutes [2 *Nazhigai*]. The paste was made into pills in the size of seeds of *Abrus precatorius [Kundri size]* which was equivalent to 130 mg, dried in the shade and bottled up.

THE ANTIOXIDANT PROPERTY:

The study showed that the antioxidant activity of test drug sample *SPK* using the 2,2-diphenyl 1-2 picrylhydrazyl (DPPH) free radical scavenging assay in the ranges of about 1.25 µg/ml, 2.5 µg/ml,5 µg/ml,10 µg/ml and 20 µg/ml using ascorbic acid as standard. *SPK* showed the highest percentage inhibition at the range of 82.52% at 20µg/ml when compare to the standard ascorbic acid with 89.62. Thus the *SPK* showed a better antioxidant property [16].

KADUKKAI VADAGAM (KV):

PREPARATION OF *KADUKKAI VADAGAM (KV):*

Kadukkai (Terminalia chebula), Kalluppu (Sodium chloride), Korai kizhangu (Cyperus rotandus), Kurochani omam (Hyoscyamus niger), Chukku (Zingiber officinale), Kodiveli ver (Plumbago indica), Thippili (Piper longum), Sevviyam (Piper nigrum), Thippili moolam (Piper longum), Milagu (Piper nigrum), Induppu (Sodium chloride impura), Omam (Carum copticum). After purification, all the processed raw material was taken and altogether to obtain fine powder form. Ginger juice was added to the obtained powder and ground well. This process was repeated with lemon juice and buttermilk respectively and made into pills.

ANTIOXIDANT ACTIVITY:

The extract of *KV* showed the highest DPPH scavenging activity (79.43%) at 20µg/ml and the lowest percentage of inhibition (11.70%) at 1.25µg/ml. Ascorbic acid (Standard) showed highest percentage of inhibition (93.51%) at 20µg/ml and the lowest percentage of inhibition (21.60%) at 1.25µg/ml. Thus the "*Kadukkai Vadagam" (KV)* showed a better antioxidant property [17].

AAVARAI KUDINEER (*AK):*

Aavarai Kudineer was mentioned in the classical siddha literature for the indication of diabetes. This kudineer powder gave better results for Dm patients while observing OPD cases**.**

ANTI-OXIDANT ACTIVITY:

This study showed the antioxidant efficacy in the method of DPPH. The Aqueous extract of *AK* reduced the purple color of DPPH to yellow colored picryl hydrazine at different

concentrations in the serial dilution 500, 250, 125, 62.5, 31.25µg/ml showed the significant ($P<0.05$) antioxidant activity. Thus the Aqueous extract of *AK* showed a better antioxidant property [18].

VALLARAI NEI (VN):

THE ANTIOXIDANT PROPERTY:

The study showed the antioxidant activity of *Vallarai nei* DPPH, Nitric oxide scavenging activity, Superoxide free radicals scavenging activity. Thus the *Vallarai nei* showed a better antioxidant property [19].

SANJEEVI THEENEER (ST):

PREPARATION OF *SANJEEVI THEENEER:*

Ingredient	**Botanical Name**	**Part Used**	**Quantity**
Chukku	*Zingiber officinale*	Dry Rhizome (Outer skin removed)	-60 g
Milagu	*Piper nigrum*	Dry fruit	-60 g
Thippili	*Piper longum*	Dry Berry	-10g
Kadukkai	*Terminalia chebula*	Dry fruit (seed were removed)	-25g
Nellikkai	*Phyllanthus emblica*	Dry fruit (seed were removed)	-50g
Tantrikkai	*Terminalia belerica*	Dry fruit (seed were removed)	-25g
Omam	*Trachyspermum ammi*	Dry fruit	-25g
Vaividangam	*Embelia ribes*	Dry fruit	-25g
Chithramoolam	*Plumbago zeylanica*	Dry Root Bark	-30g
Korai kizhangu	*Cyperus rotundus*	Dry Tuber	-25g
Panam karkandu	*Borassus flabellifer*	Palm Candy	-20g
Irumbu Podi	*Purified Ferrum powder*	--	-60 g
Water			-6 Litres

All the raw drugs were purchased were purified and then the ingredients were pounded nicely in a stone mortar and soaked in water for 7 days. On the 8th day all the ingredients were undergone distillation process as per the standard procedures.

ANTI-OXIDANT ACTIVITY:

The present study showed that the antioxidant activity of *Sanjeevi theeneer (ST)* against the DPPH (2, 2-diphenyl 1-2 picrylhydrazyl) free radical. 2.5 ml of sample solution was added to the 1 ml of 0.3 mm DPPH methanol solution in different concentrations and kept in at the room temperature. Absorbance was read by using double-beam U.V Spectrophotometer at 517 nm. The antioxidant property of test sample ST required to scavenge DPPH radical in 50% of inhibition (IC50 value) obtained at 90.19 ± 8.57 µg /ml as compared with standard Ascorbic acid showing 50% of inhibition (IC50 value) (46.91± 9.93 µg /ml) showing its anti-oxidant activity[20].

DHASALAVANA DHRAVAGAM (DLD):

The ingredients were purified. 1. Salt petre *(Suththitha Vediyuppu)*- 120gm, 2. Purified Alum *(Suththitha Padigaram)*- 120gm, 3. Purified Rock salt *(Suththitha Kalluppu)*- 40gm, 4. Purified Halite *(Suththitha Indhuppu)*- 40gm, 5. Purified Sal ammoniac *(Suththitha Navacharam)*-20gm, 6. Purified Common salt *(Suththitha Kariyuppu)*-20gm, 7.Purified Borax *(Suththitha Vengaram)*- 15gm, 8. Purified Green vitriol *(Suththitha Annabedi)* -50gm, 9. Purified Fullers earth *(Suththitha Pooneeru)* -5gm and 10. Purified Blue vitriol *(Suththitha Thurusu)*-5gm mixed and ground together in the stone mortar. Finally, all the mixture was transferred to the *Valaiyanthiram* (Distillation apparatus) and subjected to distillation. The end product *Dhasalavana dhravagam* was collected in the vessel and stored in an airtight container.

THE ANTIOXIDANT PROPERTY:

The study showed that the *Antioxidant potential of DLD was validated by using DPPH radical scavenging assay. DLD possess a potent antioxidant activity at (91.3%) relatively near to the standard drug.* Thus the *DLD* showed a better antioxidant property [21].

NAMACHIVAYA CHENDOORAM (NMC):

PREPARATION OF *NAMACHIVAYA CHENDOORAM (NMC):*

Purified Mercury- 35gm, Purified Cinnabar- 35gm, Purified Perchloride of Mercury- 35gm, Purified Calomel- 35gm, Purified Yellow Arsenic- 35gm, Purified Magnetic oxide of Iron- 8.75 gm, *Aloe vera* juice- 450 ml, *Datura discolor* juice- 250ml. All the ingredients were triturated and made into pellets and ignited then final chendhooram was obtained.

ANTIOXIDANT ACTIVITY:

This study showed that the *NMC* antioxidant property against DPPH assay as ascorbic acid as standard drug. The study showed the efficacy at the lowest concentration of about 1.25 (µg/ml) showed the test drug 27.62% with standard 19.17% and highest concentration of antioxidant property showed at the range of about 20 (µg/ml) in test drug 62.21 % with standard 89.62%. Thus the "*Namachivaya Chendooram"* (*NMC)* showed a better antioxidant property [22].

***GANDHAGA CHENDOORAM* (*GC*):**

PREPARATION OF *GANDHAGA CHENDOORAM*

Purified Gandhagam and purified lingam were powdered in stone mortar. The *Calotropis* flower juice was extracted and the remaining substance was kept a side. Then the powder was grounded with *Calotropis* flower juice for 9 hours and made into pellet and dried in the sunshade. The pellet was placed between the remaining substances inside the earthenware. It was sealed with clay smeared ribbon cloth. A small pit was made on the earth and it was filled with 4 inches of sand and the earthenware was placed over the sand and it's covered by 350 grams of cow dung cakes and then incinerated. Similarly, the process was repeated with 1.75 kgs of cow dung cakes under capsule heating process (*manal maraivu pudam*). 3rd time it was incinerated with 2.1 kgs of cow dung cakes and the finished product *Gandhaga chendooram* was obtained.

ANTIOXIDANT ACTIVITY:

This study showed that the *GC* antioxidant property against DPPH assay as ascorbic acid as standard drug. The study showed the efficacy at the lowest concentration of about 1.25

(µg/ml) showed the test drug 4.66% with standard 21.90% and highest concentration of antioxidant property showed at the range of about 20 (µg/ml) in test drug 53.61 % with standard 96.15%. Thus the "*Gandhaga Chendooram"* (*GC)* showed a better antioxidant property [23].

ASHTABAIRAVACHENDURAM (ABC):

PREPARATION OF *ASHTABAIRAVACHENDOORAM:*

1. Purified Realgar - 35gm

2. Purified Orpiment - 35gm

3. Purified Magnetic Oxide of Iron - 35gm

4. Purified Calomel - 35gm

5. Purified Cinnabar - 35gm

6. Purified Mercury - 35gm

7. Purified Sulphur - 35gm

8. Purified White Arsenic - 35gm

Juice of the following herbals,

1. Acalyphaindica - 60 ml

2. Piper betle - 60 ml

3. Gossypium herbaceum- - 60 ml

4. Enicostemma axillare- - 60 ml

5. Ocimum sanctum - 60ml

Procedure:

All the above mentioned metal and mineral ingredients were taken, powdered separately and ground well in a *kalvam* (stone mortar). *Kuppaimeni* juice was added to it ground for 3 hours.

Then it was ground by adding *Vetrilai, Paruthi, Velarugu, Thulasi* respectively for 3 hours each. The mixture was made into pellets and allowed to dry. The pellets were kept in a mud pot covered by betel leaf paste. This is covered by another pot and their mouths are sealed with seven layers of mud sealed cloth. Then it was ignited for 12 hours using *deepakkini* (small flame). Finally, the clay smeared cloth was removed and the pots were separated. The *Chenduram* was found sticking to the upper pot. This was collected by a clean spoon and labeled as *Ashta Bairava Chenduram (ABC).*

ANTIOXIDANT PROPERTY:

The study showed that the ABC has a potent antioxidant property in DPPH assay. Maximum of 62.12% and 89.62% anti-radical effects are exercised by *Ashta Bairava Chenduram* and standard drug ascorbic acid at concentrations of 20 µg/ml respectively. Minimum percentage of inhibition 20.78% and 40.89% % anti-radical effects are manifested by *Ashta Bairava Chenduram* and standard drug ascorbic acid at concentrations at 1.25µg/ml. Thus the**"***Ashta Bairava Chenduram (ABC)"*showed a better antioxidant property[24].

RASA CHENDHURAM *(RCM):*

PREPARATION OF THE DRUG:

The flower juice of the yellow variety of Mirabilis jalapa was ground well with all the raw drugs in the stone mortar for 6 hours(2 saamam) till the juice and the drugs gets spread well in the mortar on all sides. On the next the collected medicine was placed in a mud jar and it was closed with a proper lid and sealed up tightly with 7 layers of mud smeared cloth, then the mud jar was placed in the vaalugaendiram. Then it is to be ignited with kamalakini for 6 hours (2 saamam) then for kaadakini for next 6 hours. Then it is to be left aside for the whole night to allow it to cool. Then the obtained chendhuram was collected, ground, weighed and placed in an airtight container.

THE ANTIOXIDANT PROPERTY:

The study showed that the *Rasa chendhuram (RCM)* which was a herbomineral formulation in Siddha system of medicine was showed a better antioxidant activity in (DPPH Assay). IC50 value of *Rasa Chendhuram* was found at 215.82µg/ml (calculated using ED50 plus

V1.0 Software) possessed antioxidant activity in compared to the standard ascorbic acid. Thus the *Rasa chendhuram (RCM)* showed a better antioxidant property [25].

BHRAMASTHIRAM (BA):

PREPARATION OF *BHRAMASTHIRAM (BA):*

Minerals materials:

1. *Veeram* (Hydragyrum Perchloride) - 70gm

2. *Kariyuppu* (Sodium chloride) - Sufficient quantity (3.kg)

Plant materials:

3. Vellai Saranai (*Trianthema decandra*) - Sufficient quantity (25 kg)

4. Puliyarai (*Oxalis coriculata*) - Sufficient quantity (1 kg)

5. Aagayathamarai (*Pistia stratiotes*) - Sufficient quantity (6 kg)

PROCEDURE:

A mud pot was taken, into which *Vellai saradai* (T*rianthema decandra*) leaves are spread into a thin layer. Then 1/8 part of the salt was spread over the leaves, by layers. This process was repeated alternatively with the same quantity of leaves and salt. The mud pot was filled with three layers of leaves and 3/8 part of salt. Similarly, the rest of the leaves and salts were spread one over the other so as to be arranged in eight such layers. The top most layer should be the leaves. The mud pot was covered with a lid and then sealed with the seven layers of mud pasted cloth and let dried. It was subjected to calcination using cow dung cakes which is about 8-10 times the weight of the *kavasam.* It is then cooled and the product (salt) was collected carefully. The process of ignition was repeated for about ten times, fresh leaves of *Vellai saradai* is to be used each time. Then the product of ignition was divided into 10 equal parts. The first part was placed in the *kalvam* and rubbed with the juice of *puliyarai* leaves and made into a paste. The above paste used as *kavasam* for sealing the *savveram* mass and dried in the hot sun. The above process was repeated with the remaining 9 parts and dried for 10 days. Then, the *veera kavasam* was placed in an *Erippu chutty* (earthenware) and is covered with a suitable lid and then subjected to *pudam* (calcination). It was ignited with low

flame *Deepakini & Kamalakini* each for about 1 *Saamam* (3 hours). Then it was followed by iginition with high flame (*kadaagini*) for about 6 hours. It was then allowed to cool. After that the pot was unsealed and *pathangam* was collected carefully. Finally, the mixture was collected, weighed and kept in an airtight container and was labeled as *BA*.

ANTIOXIDANT PROPERTY:

The extract of *BA* showed the highest DPPH scavenging activity (65.50%) at 20µg/ml and the lowest percentage of inhibition (20.35%) at 1.25µg/ml. Ascorbic acid (Standard) showed highest percentage of inhibition (96.15%) at 20µg/ml and the lowest percentage of inhibition (21.90%) at 1.25µg/ml. Thus *BA* showed a better antioxidant property [26].

RASA PARPAM (RP):

Ingredients

Vaalai Rasam (Purified Elemental Mercury) 35gms, *Gandhagam* (Sulphur) 35gms, *Kattuulli* – Indian squill (*Urginea indica*) 35gms.

Procedure:

Indian squaill and Sulphur – each 35gms were taken and placed in a stone mortar and ground well to get a paste. This is made as a pellet. The pellet was kept in an earthen pot and medicated oil was obtained by calcination method using the equipment – *Kuzhi puda Karuvi.* This oil got by *Pudam* (*Kuzhi puda thylam*) was added to *Vaala Rasam* and kept exposed to sun light for one day. And the substance was dried. This was ground with the above oil and made as a pellet. Bricks were taken and crushed into pieces to the size of betel nut. Half of the brick pieces were spread in a round bottom earthen pot. 1 *padi* (1.3lit) of salt was layered above the brick pieces and the pellet was kept over the salt. The pot was covered with earthen dish and sealed with 8 layers of mud pasted cloth and heated using fire woods through high flame (*Kaadakkini*). After that the covering dish was removed. The sublimate was obtained in the upper earthen dish. Finally, *Parpam* was collected in a ground well. The *Rasa parpam* was collected and kept in an airtight container. The *Rasaparpam* was labeled as RP. *Panavedai alavu* (488 mg) Adjuvant: Palm jaggery. Indications: Tumor, Cervical cancer, Inguinal bubo, Abscess.

ANTIOXIDANT ACTIVITY:

The antioxidant effect of *RP* and standard drug shows 75.75% and 79.52 % anti-radical effects are exercised by *Rasaparpam* and standard drug ascorbic acid at concentrations of 20 µg/ml respectively. Minimum percentage of inhibition 10.23% and 28.14% anti-radical effects are manifested by *Rasaparpam* and standard drug ascorbic acid at concentrations at 1.25µg/ml. Thus *RP* showed a better antioxidant property [27].

KARISALAI KARPAM (KK):

Karisalai Karpam tablet was the product of SKM Siddha and Ayurveda Company (India) Limited, Erode, Tamil Nadu. It was obtained from the skm stores with the Batch No.: MHD 13002, Mfg date: April, 2013,and it was formulated by the following ingredients such as *Karisalankanni* (*Eclipta p r o s t r a t a* L. 15%), *Manjal karisalai* (*Wedelia calendulaceae* L. 15%), *Avuri* (*Indigofera tinctoria* L.15%), *Kottakkarandai* (*Sphaeranthus indicus* L. 15%), *Vallarai* (*Centella asiatica* L. 15%), *Kuppaimeni* (*Acalypha indica* L. 15%), *Siruseruppadai* (*Coldenia procumbens* L. 5%), juice of *E. prostrata* L. and *W. calendulaceae* L. (q.s.).

THE ANTIOXIDANT ACTIVITY:

The study showed that there was a marked decrease in GSH, SOD, CAT and GPx was observed in paracetamol treated animals. *Karisalai karpam with* at the doses of 100 and 200 mg/kg showed a significantly antioxidant activity by restoring the levels of liver GSH, blood GSH, SOD, CAT, GPx level. *Karisalai karpam* with at the dose of (200 mg/kg) was found to be more effective in increasing the liver and blood GSH, SOD and CAT. Thus the extract of *KK* showed a better antioxidant property [28].

IRUNELLI KARPAM (INK):

PREPARATION OF *IRUNELLI KARPAM:*

Indian gooseberry (*Nellikai*) and sulfur (*Nelikkai ghanthakam*) in equal quantity was taken and they were ground in the stone mortar to attain fine powder. This is one of the kayakarpam medicine which was used for psoriasis, eczema, and urticaria.

THE ANTIOXIDANT PROPERTY:

The study showed that the *Irunelli karpam* was more efficient in antioxidant property *in* DPPH radical scavenging activity, hydroxyl radical scavenging activity, superoxide radical scavenging activity, nitric oxide radical scavenging activity and total reducing power assay. It showed the IC 50 of the tested drug at 29.73±0.87 µg/ml for DPPH, 61.22±6.75 µg/ml for hydroxyl radical, 51.22 ± 4.75µg/ml for superoxide radical and 37.94±3.44 for nitric oxide radical. Thus the *Irunelli karpam* showed a better antioxidant property [29].

KIRAMBU KARPAM (KP):

The Purified clove was taken in a Bowl, mixed with the honey and kept in the shade for 4-5 days. After that, the clove was transferred into another dry and clean plate, allowed to dry on the direct sunlight for 2 days. Then it was ground, filtered with a pure white cloth, then it was weighed and stored it in an airtight container.

THE ANTIOXIDANT PROPERTY:

The study showed the antioxidant efficacy of '*Kirambu Karpam*' with the approximately triplet (9000µg equivalence of ascorbic acid) of inhibition against the Standard Ascorbic acid. The Hydroxyl radical scavenging, of '*Kirambu Karpam*' showed the efficacy of 75.93% with the standard Ascorbic acid standard 85.88% with the absorbance at 695 nm in the 200 µl sample concentration. 200 µl of Super Oxide Free Radical scavenging of the test drug showed the 93.33 % inhibition with the Ascorbic acid Standard was at the range of about 77.64% at 560nm. Thus the '*Kirambu Karpam*' *(KP)* showed a better antioxidant property [30].

CONCLUSION:

Oxidation is responsible for the formation of free radicals in our body. The increased levels of free radicals in the body may cause damage to the cellular components which is responsible for ageing. Siddhars are the spiritual scientists who gave the amazing solution for aging process in the name of *Kayakarpam. Kayakarpam* (antioxidant) possess a better antioxidant property due to the presence of anthocyanin and polyphenols in their medicinal preparations. Thus this system of medicine is a boon for reducing the aging process. This review compiles the detail information about the siddha formulations with its antioxidant activity.

ACKNOWLEDGEMENT:

First and foremost I would like to thank the Almighty for his showers, grace, strength and caliber for doing various research. In the name of *Siddhars* who has given me power and courage to accomplish this work, I bow my head on thanks and gratitude to *Siddhars* for their blessings. Finally, I would like to acknowledge the person who mean world to me, my mother Mrs. A. Pushpavalli Rajendran for her lovable support and encouragement towards my various research work.

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