

In-Vitro Antiproliferative Effect of Cancer Medicine Karumsurathi Thailam on Cultured MCF-7 Cell Line

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Abstract: The main objective of the present investigation is to evaluate the phytochemical constituents, cytotoxic and antiproliferative effect of Karumsurathi Thailam prescribed by the Traditional Siddha Practitioner of Kanyakumari District, India. The external form of Breast Cancer medicine prescribed above 18 years was prepared with 18 different plant ingredients. Phytochemical analysis of the Thailam, aqueous, silver nitrate and ethanol extract revealed the presence of alkaloid, flavanoid, saponin, terpenoid and steroid constituents. Karumsurathi Thailam was tested against human breast cancer cell lines (MCF-7) and antigrowth effect was assessed by the MTT assays. L929 Fibroblast cells treated with Karumsurathi Thailam showed a decrease in viability when compared with the control. A significant decrease in cell viability of 56.10% (1µg/ml), 50.10% (5µg/ml), 42.5% (10µg/ml) and 40.92% (20µg/ml) was observed. The cytotoxic activity on cultured L929 cells and antiproliferative effect on MCF-7 cultured cells revealed the effect of Karumsurathi Thailam as a great potential source to rid and relapse from Breast Cancer.

Keywords: Siddha, Kalanchi, MTT assay, Karumsurathi Thailam, MCF-7

1. Introduction

Cancer is a worldwide dilemma of grave nature and it is the second leading cause of death next to cardiac diseases throughout the globe. Siddha system is one of the pioneer systems of medicine among traditional medicinal practices in India. Scientific documentation of traditional system of medicine is increasing and need for preparing it for Siddha formulation has become a need of the hour, receives the attraction of Indian Health Ministry and Indian Medical Association. A conference was cosponsored by the United Nations Educational, Scientific and Cultural Organization produced a declaration recognizing that “Traditional and local knowledge systems, as dynamic expressions of perceiving and understanding the world proficient, historically encompass a valuable contribution to science and technology” [1]. The therapeutic value of medicinal plants depends upon the existence of one or more constituents possessing certain physiological and pharmacological activity [2]. Breast cancer develops from breast tissue signs of breast cancer may include a lump in the breast, a change in breast shape, dimpling of the skin and fluid coming from the nipple or a red scaly patch of skin [3].

2. Materials and Methods

Collection of Plant Materials and Formulation of Medicine

The plant materials were collected from unpolluted rural areas of India and other ingredients were procured from commercial Siddha raw drug store was authenticated and prepared by My Family Members (Siddha Traditional Practitioner). All the ingredients were shade dried, powdered and sieved was formulated into medicines and stored in porcelain pots for further use. The Siddha formulation were prepared as prescribed in the written scripts, books and palm

leaf parchments of My Grandpa and Forefathers - Traditional Vadiyars (Table -1).

Table 1: Composition of Karumsurathi Thailam/Oil

S.No	Siddha Name	Scientific Name	Quantity
1	Karunjurai	<i>Capparis sepiaria</i>	1 Kalanchi
2	Kottamalli	<i>Coriandrum sativum</i>	2 Kalanchi
3	Sadamanjil	<i>Nordostachys jatamansi</i>	1 Kalanchi
4	Kombarakku	<i>Cateria lacca</i>	1 Kalanchi
5	Venkungiliyam	<i>Shorea robusta</i>	2 Kalanchi
6	Karamjiragam	<i>Nigella sativa</i>	1 Kalanchi
7	Chukku	<i>Zingiber officinale</i>	1 Kalanchi
8	Milagu	<i>Piper nigrum</i>	1 Kalanchi
9	Thippili	<i>Piper longum</i>	1 Kalanchi
10	Elam	<i>Elleteria cardamom</i>	2 Kalanchi
11	Athimathuram	<i>Glycyrrhiza glabra</i>	1 Kalanchi
12	Chitarathai	<i>Alpinia calcarata</i>	1 Kalanchi
13	Veppampattai	<i>Azadirachta indica</i>	2 Kalanchi
14	Seenthil	<i>Tinospora cordifolia</i>	1 Kalanchi
15	Nallai Ennai	<i>Sesamum indicum</i>	1 Kalanchi
16	Thenkai Ennai	<i>Cococus nucifera</i>	1 Kalanchi
17	Pasum Pal	<i>Bos indicus</i>	1 Kalanchi
18	Vaalmilagu	<i>Piper cubeba</i>	2 Kalanchi

Phytochemical Screening, Cytotoxic and Antiproliferative Assay of Karumsurathi Thailam

Phytochemical analysis of the Karumsurathi Thailam, aqueous, silver nitrate and ethanol extract of medicine were carried out to analyse the presence of alkaloid, flavanoid, phenol, terpenoid, saponin, reducing sugar, tannin, steroid and glycoside constituents [4 & 5], cytotoxic and antiproliferative assay [6].

3. Result

Qualitative Analysis

Phytochemical analysis of Karumsurathi Thailam (oil) revealed the presence of alkaloid, flavanoid, saponin,

terpenoid and steroid constituents. On the other hand, aqueous extract of the *Karumsurathi Thailam* revealed the presence of alkaloid, flavanoid and saponin constituents. Meanwhile, ethanolic extract of the *Karumsurathi Thailam* revealed the presence of alkaloid, saponin and steroid constituents. However, silver nitrate assorted in *Karumsurathi Thailam* revealed the presence of alkaloid, phenol and steroid constituents (Table: 2).

Table 2: Qualitative Analysis of *Karumsurathi Thailam* and extracts

S.No	Phytochemicals	<i>Karumsurathi Thailam</i>	Aqueous	Ethanol	Silver nitrate
1	Alkaloid	+	+	+	+
2	Flavanoid	+	+	-	-
3	Saponin	+	+	+	-
4	Phenol	-	-	-	+
5	Terpenoid	+	-	-	-
6	Reducing Sugar	-	-	-	-
7	Tannin	-	-	-	-
8	Steroid	+	-	+	+
9	Glycoside	-	-	-	-

+ Presence - Absence

Cytotoxic Effect of *Karumsurathi Thailam* on Cultured 1929 Cells

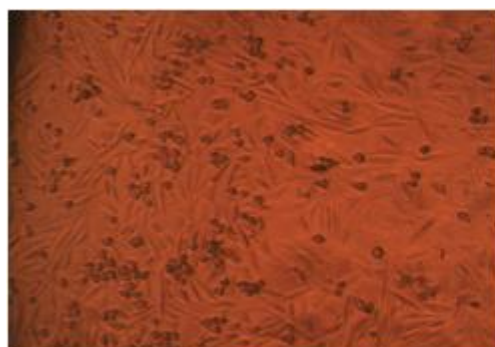
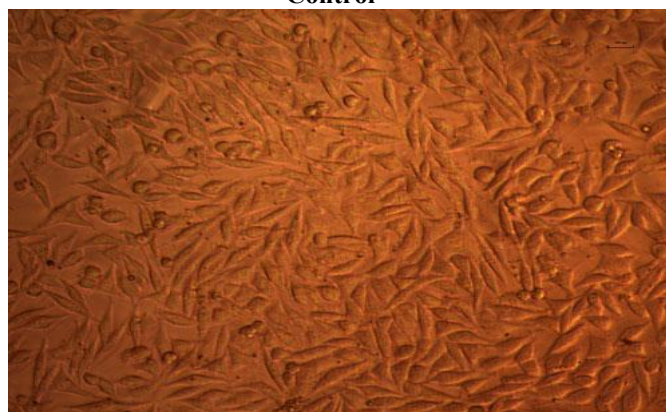
The observed results strongly profile that there was a concentration dependent cytotoxic effect of *Karumsurathi Thailam*. L929 Fibroblast cells treated with *Karumsurathi Thailam* showed a decrease in viability when compared with the control. On the otherhand, a significant decrease in cell

viability of 56.10% (1µg/ml), 50.10% (5µg/ml), 42.5% (10µg/ml) and 40.92% (20µg/ml) was observed (Table: 3). The total cell count of L929 Fibroblast cells was decreasing with increase in concentration of the *Karumsurathi Thailam* indicating an inhibitory effect on the cancer cell line (Plate-1).

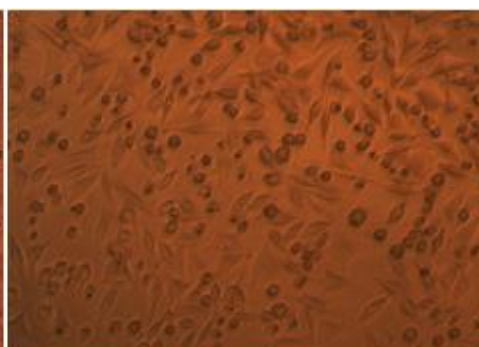
Table 3: Cytotoxic effect of *Karumsurathi Thailam*

Samples Volume (µl)	OD Values (540nm)	Percentage Viability
Control	0.3501	100
1	0.2536	56.10619
5	0.2301	50.90708
10	0.1921	42.5
20	0.185	40.9292

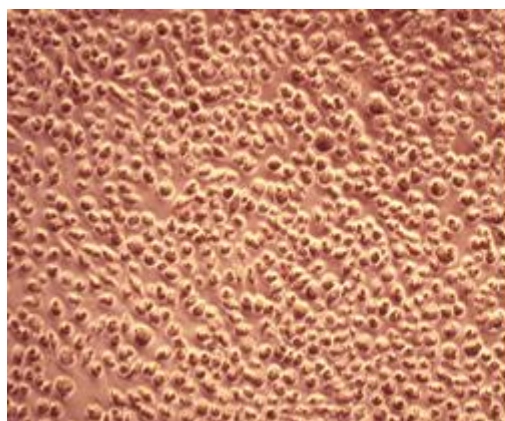
Plate-1 Cytotoxic effect of *Karumsurathi Thailam* Control



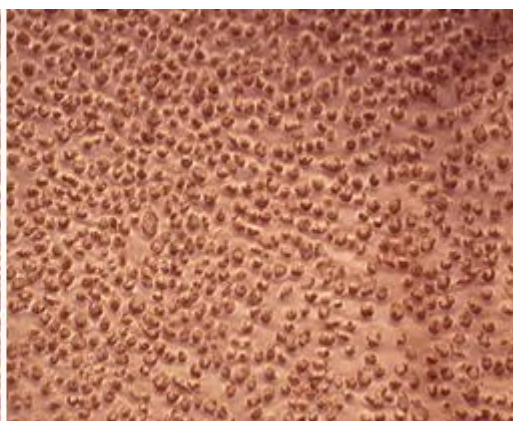
1µg/ml



5µg/ml



10µg/ml



20µg/ml

Determination of in-vitro antiproliferative effect of *Karumsurathi Thailam* on cultured MCF-7 cell line

The observed results strongly profile that there was a concentration dependent antiproliferative effect of *Karumsurathi Thailam*. MCF-7 cells treated with *Karumsurathi Thailam* showed a decrease in viability when compared with the control. On the otherhand, a significant decrease in cell viability of 89.48% (1µg/ml), 79.60% (5µg/ml), 71.37% (10µg/ml) and 51.84% (20µg/ml) was observed (Table: 4). The total cell count of MCF-7 cells was decreasing with increase in concentration of the *Karumsurathi Thailam* indicating an inhibitory effect on the cancer cell line (Plate-2).

Plate-2 Antiproliferative effect of *Karumsurathi Thailam* Control

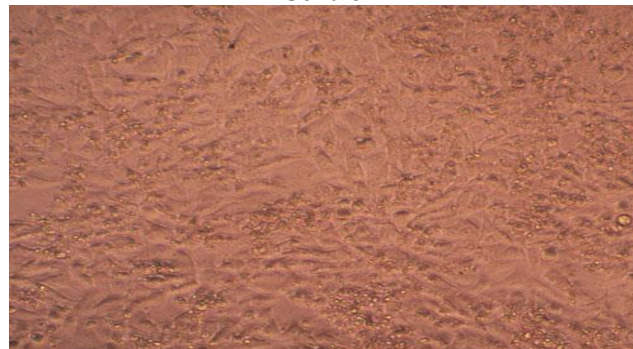
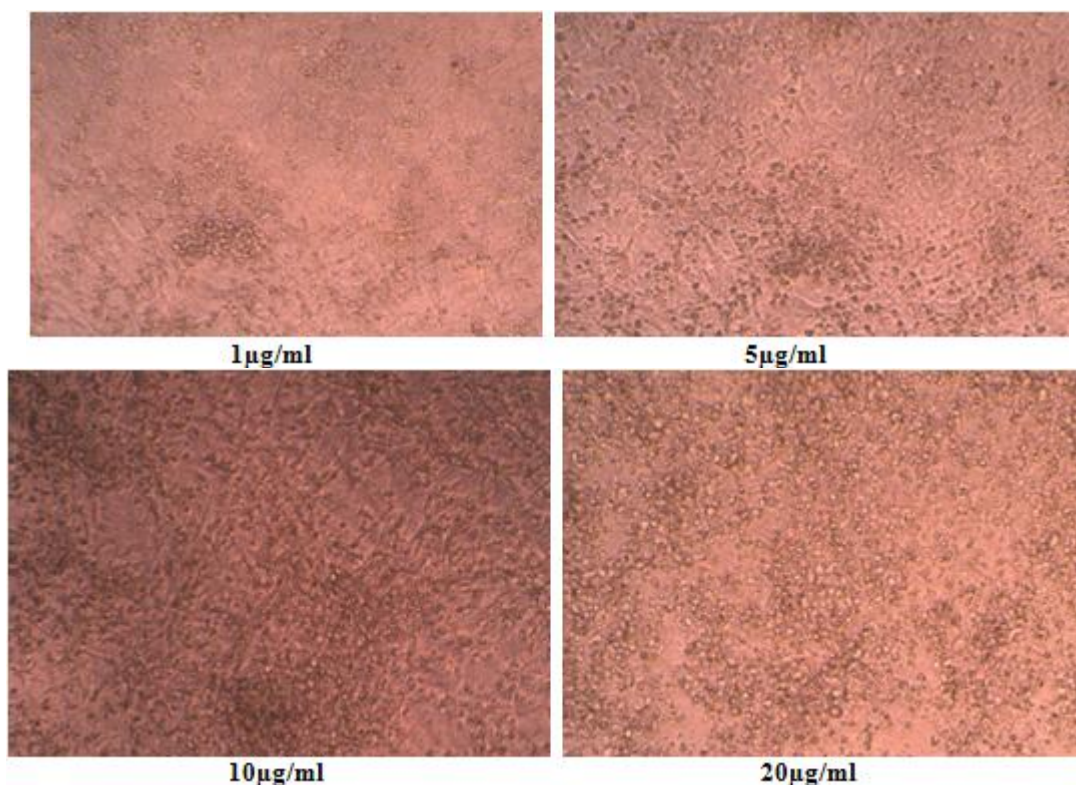


Table 4: Antiproliferative effect of *Karumsurathi Thailam*

Sample Volume (µl)	Average OD at 540nm	Percentage Viability
Control	0.3501	100
1	0.3133	89.48872
5	0.2787	79.60583
10	0.2499	71.37961
20	0.1815	51.84233



4. Conclusion

The presence of phytochemicals, cytotoxicity and antiproliferative activity of *Karumsurathi Thailam* clearly indicate that the prescribed herbal formulation act as a possible source to rid from Cancer.

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References

- [1] Thirunanasundari T, Traditional medical knowledge of tribals of Kodai hill (2014). National Conference on Indian Herbal Drugs. 1: 2-3.
- [2] Gandhiraja, N S. Sriram, V. Meenaa, J. Kavitha Srilakshmi, C. Sasikumar and R.Rajeswari 2009. Phytochemical Screening and Antibacterial Activity of the Plant Extracts of *Mimosa pudica* L. Against Selected Microbes, *Ethnobotanical Leaflets* 13:618-24.

- [3] "Breast Cancer Treatment (PDQ®)". *NCI*. 2014-05-23. Retrieved 29 June 2014.
- [4] Allen ST. *Chemical analysis of Ecological Material*. New York: Blackwell Scientific Publication; 1974. P. 313.
- [5] Harbone JR. *Phytochemical Methods. A Guide to Modern Techniques of Plant Analysis*, London: Charpan and Hall; 1976. P. 78.
- [6] Arung ET, Shimizu K, Kondo R. Inhibitory effect of isoprenoid-substituted flavonoids isolated from *Artocarpus heterophyllus* on melanin biosynthesis. *Planta Med*, 2006; 72: 847-850.