

SEM CHARACTERIZATION AND ANTIPROLIFERATIVE EFFECT OF NOVEL SIDDHA NANO FORMULATION NAGARASA PARPAM ON HEP2 CELL LINE

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ABSTRACT

Cancer is the leading disease causing mortality worldwide. Nowadays our medical world facing highest challenges regarding the treatment of cancer cases. Though chemotherapy, brachytherapies are available to treat cancer still our current trends are focussing to develop a wonderful drug to treat cancer. Since time immemorial there are some formulations were indicated in siddha literatures to treat cancer. *Nagarasa parpam* is one of the novel siddha formulation was investigated for its anticancerous effect on Hep2 cell lines using MTT assay. SEM characterization was also carried out for the drug. The MTT assay findings reveals that the drug *Nagarasa parpam* has antiproliferative effect on Hep2 cell lines. SEM characterization indicates the nano sized nature of the drug *Nagarasa parpam*. So, we can conclude that the nano formulated siddha drug *Nagarasa parpam* has promising anticancerous potentials.

KEYWORDS: Cervical cancer, Naga rasa parpam, SEM, Siddha, Nano medicine, mineral drug.

INTRODUCTION

Cancer is a dreadful disease which threatens the world nowadays. The number of people living beyond a cancer diagnosis reached nearly 14.5 million in 2014 and is expected to rise to almost 19 million by 2024¹. In siddha medicines there are many formulations were indicated to treat cancer. In siddha literatures the cancerous growth were indicated as the term "Puttru". *Nagarasa parpam* is one of the drug indicated to treat cancer in siddha literature. Even though there are lot of medications are available to treat cancer still the prevalence of all types of cancer is very high. we need an effective drug to treat cancer without any adverse effects. Characterization is essential to identify the nature of the drug. Here the novel siddha formulation *Nagarasa parpam* was investigated for its anti cancerous potential and characterized by using Scanning electron microscope.

MATERIALS AND METHODS

Trial drug

Nagarasa parpam was prepared as per the siddha literature *Yaakoebu sunna kaandam* 700. The ingredients of *Nagarasa parpam* is *Naagam, Rasam, Vediuppu*.

Cytotoxicity assay

In Vitro cytotoxic activity of siddha formulation *Nagarasa parpam* was studied on Hep2 cells. The assay is carried out using (3-(4, 5-dimethyl thiazol-2-yl)-2, 5-diphenyl tetrazolium bromide (MTT)). MTT is cleaved by mitochondrial Succinate dehydrogenase and reductase of viable cells, yielding a measurable purple product formazan. This formazan production is directly proportional to the viable cell number and inversely proportional to the degree of cytotoxicity.

The study was conducted in the Department of Animal biotechnology, Madras veterinary college, Chennai.

The % cell viability and % cell death were calculated with the following formulae:

Cell viability % = Mean OD of wells receiving each plant extract dilution / Mean OD of control wells x 100

Cell death % = 1 - (OD of sample/OD of control) x 100

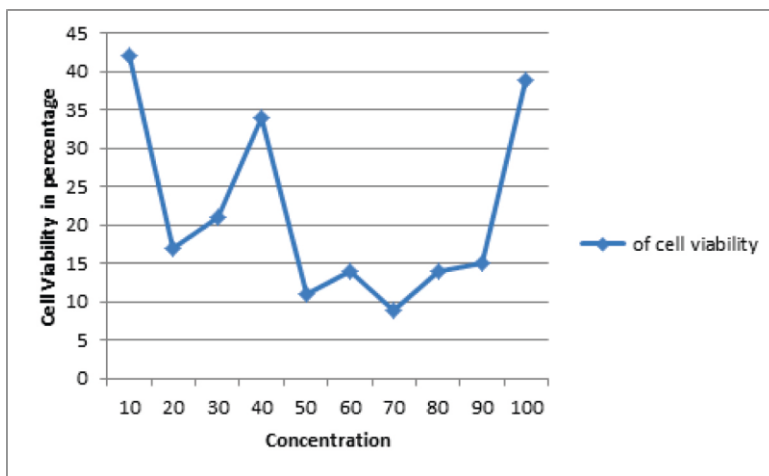
SEM analysis

Characterization of drug was carried out using scanning electron microscope to identify its size of the drug. SEM analysis of this drug was carried out in IIT madras.

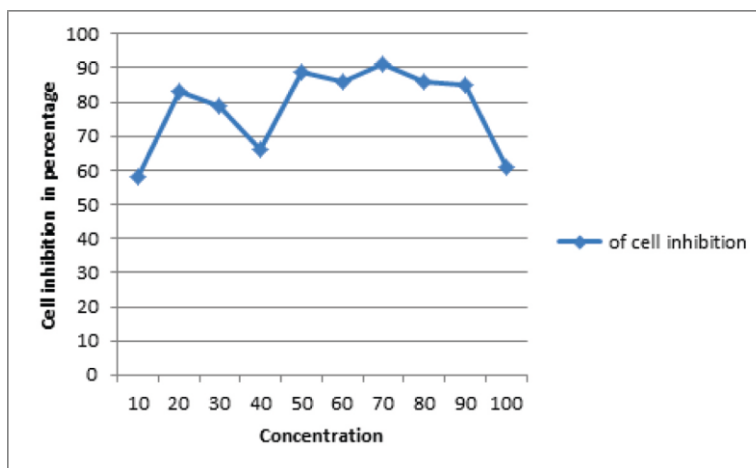
RESULTS AND DISCUSSION

Table 1: Cytotoxicity on Hep2cells by siddha drug *Nagarasa parpam* (MTT Assay).

Sl. no	concentration	Drug treated group	Control group	% of cell viability	% of cell inhibition
1	10 µg/ml	0.358	0.851	42%	58%
2	20 µg /ml	0.204	1.141	17%	83%
3	30 µg / ml	0.154	0.720	21%	79%
4	40 µg /ml	0.158	0.455	34%	66%
5	50 µg /ml	0.156	1.323	11%	89%
6	60 µg /ml	0.162	1.142	14%	86%
7	70 µg /ml	0.173	1.792	9%	91%
8	80 µg /ml	0.205	1.378	14%	86%
9	90 µg /ml	0.195	1.299	15%	85%
10	100 µg /ml	0.246	0.621	39%	61%



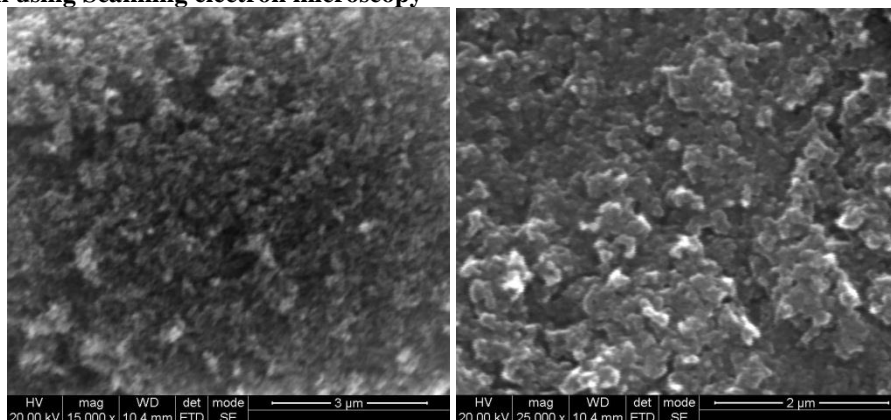
Graph 1: Cell viability in percentage.



Graph 2: Cell inhibition in percentage.

From the above findings we can confirmed that the siddha drug *Nagarasa parpam* has potent anti-cancerous effects.

Characterization using Scanning electron microscopy



SEM images of *Naga parpam*

We can observe that the particles of *Nagarasa parpam* are in nano sizes. So, the bioavailability of drug will be good.

CONCLUSION

The study confirms that the novel siddha formulation *Nagarasa parpam* has promising effect of anti cancer activity. SEM images confirmed that the particles of the trial drug *Nagarasa parpam* are found in nano and near nano range. It is concluded that the nano formulated siddha drug *Nagarasa parpam* exhibits potent anti cancer effect on hep2 cell lines. Further researches have to be carried out to understand the mechanism of anti cancerous potential of *Nagarasa parpam*. This research work found as a base for the use of siddha drug *Nagarasa parpam* to treat cancer.

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