

QUALITATIVE ANALYSIS AND ANTIOXIDANT POTENTIAL OF NELLIKAI DECOCTION

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Abstract

Cancer is a major health problem in the world wide. The symptoms and root cause were different in each person. In the present situation the life style modification and climatic changes play key root of the disease. During ancient days the patients were treated with internal and external medicines to eliminate toxins from the body. Nellikai decoction showed the presence of different types of phyto constituents and antioxidant have the effect on cancer and acts as good source in the initial stage of treatment.

Key words: cancer, Nellikai decoction, Kalanchoe, Phyto constituent

Introduction

Cancer is a serious metabolic disease, causing uncontrolled division and survival of transformed cells. A host of molecules, factors and condition have been designated as underlying causes for the inception and progression of the disease (Arun Upadhyay, 2020). Cancer occurs by a series of successive mutations in genes so that these mutation change cell functions. Chemical compounds have an obvious role of forming gene mutations and cancer cells. Cancer is the second leading cause of mortality world wide, the prevalence of cancer has actually increased. In addition, smoking involves several carcinogenic chemical compounds that leads to cancer.(Aizawa et.al.,2016).The mortality rate as per 2021 is 60.44 per 10,000 population in India.(Jena et.al.,2024).Nellikai decoction and extracts are rich in bioactive compounds with significant antioxidant, anti inflammatory and anti-diabetic properties. (Po-Hsien Li 2022).Natural products have proven to be promising anti-cancer agents due to their diverse chemical structures and bioactivity. Medicinal plants contain bioactive compounds, such as flavonoids, alkaloids, terpenoids and polyphenols which exhibit various anticancer properties. There are still challenges in the development and use of natural products as anticancer drugs, such as the need for further research in to their mechanisms of action, possible drug interactions and optimal dosage (Andrej jenca et al.,2024).

Materials and Methods

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The Nellikai decoction is the formulated by using 1 to 25 Kalanchi (1 Kalanchi=5gm.) of medicinal plant part of thippili, Nellikai, Kadukai, Kadukkai, Kadartengay, Kiraththandu, Jadamanjil, Veppampattai Karamjiragam, Seenthil, Kottamalli, Omam, Jathipathiri, Illavangam, Athimathuram, Chitarathi, Adathoda, Nerunjil, Mukkulikkirai, Kattuppakkal, Kattukirambu, Karkadashingi, Katukurohini, Karpurappul, Gopuramtang, Korai, Chathakuppai and Kekkuvitai. were collected from the western Ghats. The collected medicinal plant parts were sun dried for one week and then powdered by using mortar and pestle. The collected ingredients dried and crushed medicines mixed with water and allow to boil until it reduces to 750 ml. and was sieved by using a sieved by cotton cloth and stored in earthen pot for further scientific assessment. The phytochemical of flavonoid, terpenoid, phenol, alkaloid, saponin, tanin, steroid, reducing sugar, amino acid, saponin, tanin, steroid, reducing sugar, amino acid, glycosides in the solvent extracts of control, aqueous, ethanol, chloroform, methanol and acetone were analysed by using standard procedure (Harborne, 1973). Hydroxyl radical scavenging activity was measured by the standard procedure of Halliwell et al., 1987.

Result and Discussion

Nellikai decoction is an internal cancer medicine. Twenty seven medicinal plants were used in different combination of kalanchi for decoction preparation. Piper longum, Terminalia chebulla, Lodoclea maldivica, Nigella sativa, Carum copticum, Myristica fragrans, Cinnamomum verum, Rhus succedanea, Cyperus rotundus 1 kalanchi, Azadirachta indica, Tinospora cordifolia, Coriandrum sativum, Glycyrrhiza glabra, Protulaca quadrifida, Ludwigia octovalvis, Cymbopogon citratus, Carum carvi 2 kalanchi, Alpinia speciosa, Adathoda vasica, Tribulus terrestris, Momordica dioica, Veratei viridii Andrographis echinodes, Anthemum graveolens 3 kalanchi, Amaranthus gangeticus 4 kalanchi, Nardostachys grandifolia 5 kalanchi and Emblica officinalis 25 kalanchi are the ingredients used for preparation of Nellikai decoction.

Table:1 Composition of Nellikai Decoction

Sl.No.	Botanical Name	Quantity
1.	<i>Piper longum</i>	1 Kalanchi
2.	<i>Emblica officinalis</i>	25 Kalanchi
3.	<i>Terminalia chebulla</i>	1 Kalanchi
4.	<i>Lodoclea maldivica</i>	1 Kalanchi
5.	<i>Amaranthus gangeticus</i>	4 Kalanchi
6.	<i>Nardostachys grandifolia</i>	5 Kalanchi
7.	<i>Azadirachta indica</i>	2 Kalanchi
8.	<i>Nigella sativa</i>	1 Kalanchi
9.	<i>Tinospora cordifolia</i>	2 Kalanchi
10.	<i>Coriandrum sativum</i>	2 Kalanchi
11.	<i>Carum copticum</i>	1 Kalanchi
12.	<i>Myristica fragrans</i>	1 Kalanchi
13.	<i>Cinnamom verum</i>	1 Kalanchi
14.	<i>Glycyrrhiza glabra</i>	2 Kalanchi
15.	<i>Alpinia speciosa</i>	3 Kalanchi
16.	<i>Adathoda vasica</i>	3 Kalanchi
17.	<i>Tribulus terrestris</i>	3 Kalanchi
18.	<i>Protulaca quadrifida</i>	2 Kalanchi
19.	<i>Momordica dioica</i>	3 Kalanchi
20.	<i>Ludwigia octovalvis</i>	2 Kalanchi
21.	<i>Rhus succedanea</i>	1 Kalanchi
22.	<i>Veratri viridi</i>	3 Kalanchi
23.	<i>Cymbopogan citrates</i>	2 Kalanchi

Qualitative of Nellikai and solvent	24.	<i>Andrographis echinoides</i>	3 Kalanchi	analysis decoction extracts
	25.	<i>Cyperus rotundus</i>	1 Kalanchi	
	26.	<i>Anethum graveolens</i>	3 Kalanchi	
	27.	<i>Carum carvi</i>	2 Kalanchi	

Phyto constituents	Solvent Extracts					
	control	Aqueous	Ethanol	Chloroform	Methanol	Acetone
Flavanoid	+	+	+	+	+	+
Terpenoid	+	-	+	+	-	-
Phenol	+	+	-	-	+	+
Alkaloid	+	-	-	-	+	-
Saponin	+	+	+	+	+	-
Tannin	+	-	-	-	-	+
Reducing sugar	+	-	-	+	+	-
Aminoacid	+	+	-	-	-	+
Glycosides	-	-	-	+	-	-

In Nellikai decoction of qualitative analysis shows the presence of flavonoid, terpenoid, alkaloid, phenol, tannin, saponin, reducing sugar, amino acid in all solvent extracts except glycosides in control. The aqueous extract was present in flavonoid, phenol, saponin, steroid, amino acid. The ethanol extract was present in flavonoid, terpenoid and saponin. The chloroform extract is present in flavonoid, terpenoid, saponin, reducing sugar and glycosides. The presence of methanol extract was in flavonoid, phenol, alkaloid, saponin and reducing sugar. The acetone extract was present in flavonoid, phenol, tannin and amino acid. In general qualitative analysis of Nellikai decoction showed flavonoid is present in all the tested solvent extracts in control. Glycoside was absent in all solvent extract, except chloroform.

Antioxidant Activity

Hydroxyl radical- scavenging activity

Conc. Of extracts	Control	Aqueous	Ethanol	Chloroform	Acetone	Vitamin- c(standard)
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25µl	62.87 ± 0.00	16.44 ± 0.00	21.02 ± 0.01	8.95± 0.01	16.24 ± 0.03	68.98± 0.00
50µl	67.64± 0.00	18.59 ± 0.01	23.83 ± 0.00	9.24± 0.01	18.13± 0.04	75.19 ± 0.02
75µl	75.91 ± 0.01	24.38± 0.04	25.36 ± 0.02	11.68 ± 0.03	19.48 ± 0.03	79.56± 0.01
100µl	83.83 ± 0.00	27.16± 0.00	27.00± 0.00	13.42 ± 0.00	22.72± 0.00	85.98± 0.00

Hydroxyl radical scavenging activity shows minimum scavenging to maximum scavenging activity. The concentration of extracts were 25µl, 50 µl, 75 µl and 100 µl. In control the minimum scavenging activity were 54.76 ± µl 0.00(25 µl) to the maximum 69.01±

0.01%(100 µl). The aqueous extract shows variation 31.11± 0.00(25 µl) to 39.62± 0.00%(100 µl). The ethanol extract varied from 26.23 ± 0.01%(25 µl) to the maximum 35.14± 0.00%(100 µl). The chloroform extract varied from 16.35± 0.01%(25 µl) to the maximum 27.54 ± 0.00%(100 µl). The acetone extract varied from 5.35± 0.01%(25 µl) to the maximum 9.58± 0.00%.(100 µl). The standard vitamin-c extract varied from 61.13 ± 0.00%(25 µl) to the maximum 74.79± 0.01%(100 µl). In general acetone shows the minimum activity 5.35± 0.01%(25µl) and maximum in standard vitamin -c 74.79±0.01%(100µl) of hydroxyl radical scavenging activity.

Effect on HeLa with Nellikai decoction

MTT assay-Nellikai decoction with HeLa		
Culture condition	% Cell viability	IC50 conc($\mu\text{g/ml}$)
Untreated	100	73.19
Std.control	49.15	
6.25 μg	93.83	
12.5 μg	87.51	
25 μg	79.50	
50 μg	66.17	
100 μg	32.59	

The effect on HeLa with sample showed a concentration dependent effect of Nellikai decoction. The concentration increased from 6.25 $\mu\text{g/ml}$ to 100 $\mu\text{g/ml}$ and the percentage of inhibition increased from 6.25 $\mu\text{g/ml}$ of 93.83%, 12.5 μg of 87.5%, 25 μg of 79.50%, 50 μg of 66.17%, 100 μg of 32.59%. At the concentration 100 μg there was a decrease in cell viability of 32.59% (Table & Plate). In general, the total cell count of HeLa cells decreasing in the concentration of Nellikai decoction indicating an inhibitory effect on the cancer cell lines. The IC50 concentration of Nellikai decoction is 73.19 $\mu\text{g/ml}$.

Discussion and conclusion

A single Indian gooseberry contains approximately 600-800% of the daily value (DV) for this Vitamin-C can optimize immune health in several ways. It is an antioxidant. So it works to decrease cellular damage and inflammation. (Nayan Borah, 2022).

Nellikai decoction and extracts are rich in bioactive compounds with significant antioxidant, anti-inflammatory and anti-diabetic properties. (Po-Hsien et al., 2022)

Conclusion

In this study all the extracts evaluated under phytochemical analysis. Flavanoid, Saponin were phytochemical compounds, that found major in analysis. The antioxidant were present in Nellikai decoction.

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