Frontiers in Health Informatics
ISSN-Online: 2676-7104
www.healthinformaticsjournal.com
2024; Vol-13: Issue 8
Open Access

# Qualitative Analysis And Antioxidant Potential Of Nellikai Decoction

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Cite this paper as: Anila Janet Mary M and Dr. B Christudhas Williams (2024). Qualitative Analysis And Antioxidant Potential Of Nellikai Decoction. Frontiers in Health Informatics, Vol. 13, No.8, 7358-7363

## 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, Kalanchi, 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

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, Gopuramtangi, 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 earthern pot for further scientific assessment. The phytochemical of flavonoid, terpenoid, phenol, alkaloid, saponin, tanin, steroid, reducing sugar, aminoacid, 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 the standard procedure of Halliwell et al.,1987

**Result and Discussion**

**Table:1 Composition of Nellikai Decoction**

| Sl.No. | Botanical Name | Quantity |
|---|---|---|
| 1. | *Piper longum* | 1 Kalanchi |
| 2. | *Emblica officinalis* | 25 Kalanchi |
| 3. | *Terminalia chebulla* | 1 Kalanchi |
| 4. | *Lodociea maldivica* | 1 Kalanchi |
| 5. | *Amaranthus gangeticus* | 4 Kalanchi |
| 6. | *Nardostachys grandifolia* | 5 Kalanchi |
| 7. | *Azadirachta indica* | 2 Kalanchi |
| 8. | *Nigella sativa* | 1 Kalanchi |
| 9. | *Tinospora cordifolia* | 2 Kalanchi |
| 10. | *Coriandrum sativum* | 2 Kalanchi |
| 11. | *Carum copticum* | 1 Kalanchi |
| 12. | *Myristica fragrans* | 1 Kalanchi |
| 13. | *Cinnamom verum* | 1 Kalanchi |
| 14. | *Glycyrrhiza glabra* | 2 Kalanchi |

| | | |
|---|---|---|
| 15. | *Alpinia speciosa* | 3 Kalanchi |
| 16. | *Adathoda vasica* | 3 Kalanchi |
| 17. | *Tribulus terrestris* | 3 Kalanchi |
| 18. | *Protulaca quadrifida* | 2 Kalanchi |
| 19. | *Momordica dioica* | 3 Kalanchi |
| 20. | *Ludwigia octovalvis* | 2 Kalanchi |
| 21. | *Rhus succedanea* | 1 Kalanchi |
| 22. | *Veratri viridi* | 3 Kalanchi |
| 23. | *Cymbopogan citrates* | 2 Kalanchi |
| 24. | *Andrographis echioides* | 3 Kalanchi |
| 25. | *Cyperus rotundus* | 1 Kalanchi |
| 26. | *Anethum graveolens* | 3 Kalanchi |
| 27. | *Carum carvi* | 2 Kalanchi |
| 28. | *Cinnamom verum* | 1 Kalanchi |
| 29. | *Glycyrrhiza glabra* | 2 Kalanchi |
| 30. | *Alpinia speciosa* | 3 Kalanchi |
| 31. | *Adathoda vasica* | 3 Kalanchi |
| 32. | *Tribulus terrestris* | 3 Kalanchi |
| 33. | *Protulaca quadrifida* | 2 Kalanchi |
| 34. | *Momordica dioica* | 3 Kalanchi |

| | | |
|---|---|---|
| 35. | *Ludwigia octovalvis* | 2 Kalanchi |
| 36. | *Rhus succedanea* | 1 Kalanchi |
| 37. | *Veratri viridi* | 3 Kalanchi |
| 38. | *Cymbopogan citrates* | 2 Kalanchi |
| 39. | *Andrographis echioides* | 3 Kalanchi |
| 40. | *Cyperus rotundus* | 1 Kalanchi |
| 41. | *Anethum graveolens* | 3 Kalanchi |
| 42. | *Carum carvi* | 2 Kalanchi |

**Qualitative analysis of Nellikai decoction and solvent extracts**

| 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) |
|---|---|---|---|---|---|---|
| 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) to39.62± 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 sample**

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

The effect on HeLa with sample showed a concentration dependent effect of Nellikai decoction.The concentration increased from 6.25µg/ml to 100µg/ml and the percentage of inhibition increased from 6.25µg/ml. of 93.83%,12.5µg of 87.5%.25µg of 79.50%,50µg of 66.17%,100µg of 32.59%.At the concentration 100µg 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 73.19µg/ml.

Discussion and coclusion

Nayanah Borah(2022) stated that 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.

Po-Hsien stated that Nellikai decoction and extracts are rich in bioactive compounds with significant antioxidant,anti inflammatory and anti diabetic properties.

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

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