# THERAPEUTIC PROPERTIES OF “*NEELAM SAMBA*” - A TAMILNADU TRADITIONAL RICE VARIETY

**KALAIVANI. R, BAKIYA LAKSHMI S. V, SUMITHRA D**

 Department of Biotechnology,

Bon Secours College for Women, Villar, Thanjavur, Tamilnadu, India.

Affiliated with Bharathidasan University, Tiruchirappalli

**E. mail:** bakiyalakshmi.sv@gmail.com, vanisri05bio@gmail.com, gksumin@gmail.com

# Abstract

Brown rice has rich nutrients important for a healthy food regimen even as parboiling rice is wealthy in nutrition and micronutrients. The knowledge about traditional rice varieties has not reached the public and also scientific interference about the traditional varieties. This is the time to highlight the significance of medicinal value and its properties in a scientific manner. To reveal the Bioactive compounds and the medicinal properties of traditional rice variety ***Neelam samba***, to restore our indigenous knowledge about rice, enhance the nutritional values, with a view the study is indented to analyze the Bioactive compounds and its Pharmacological activities of selected rice variety. The GCMS study revealed the Presence of antimicrobial, anti-inflammatory antioxidant, anticancer and Sex Pheromone compounds. The selected rice variety will be used for development of functional foods and various other value-added products for sustainable healthy life.

**Keywords:** *Neelam Samba***,** Traditional Rice, GCMS, Bioactive Compounds

# Introduction

# The maximum not unusual rice fed on with the aid of people is white rice, observed by means of brown rice; but rice genotypes with purple, red or black bran layer have been cultivated for a long term in Asia (Ahuja et al., 2008). colored rice possesses unique coloration and taste, therefore they are used as an aspect in lots of dishes. but, because of the problem in the time period of the difficult texture of cooked colored rice, they may be not popular for consumption even though it has been long known approximately the useful results of pigment in those corporations of rice. conventional varieties had unique dietary and medicinal features. these types are almost in the verge of extinction because the vintage landraces are considered uneconomical as compared to the brand-new, short-period types. Neelam Samba is a conventional range that is surprisingly appropriate for cultivation in regions that are vulnerable to water logging. The plant is immune to pests such as brown plant hopper and ear head trojan horse.

# Altogether, the value of cultivation could be very low. those facts are favorable and worthwhile to the rural farming network. The goal of this look at became to examine the phytochemical and its Pharmacological position of organic traditional rice range Neelam samba. this may facilitate further information of its inherent houses that will assist toward optimizing its usage and make it commercially feasible.

# Materials and Methods

The traditional rice variety **“*Neelam Samba*”** was collected from a Thanjavur District, Tamilnadu. The paddy samples obtained were stored under -20°C in deep freezer. This paddy was taken out kept in the atmospheric condition for equalization of moisture and after allowing for a week’s exposure the moisture was analyzed and the paddy was shelled in the “Satake” Laboratory model Rubber Role Sheller. After shelling it was pulverized in “Fritze” pulverizer and used for analysis.

# Analysis of Bioactive compounds by GC-MS

# 25g of Neelam Samba rice powder become soaked in 95% ethanol for 12 hours. The extracts have been then filtered through Whatmann filter paper No. 41 together with 2 g sodium sulphate to get rid of the sediments and lines of water inside the filtrate. The filtrate changed into then concentrated by way of effervescent nitrogen gasoline into the solution. The extract contained both polar and non-polar phytocomponents. 2µl of this pattern solution turned into hired for GC/MS analysis. GC-MS analysis turned into accomplished on a GC Clarus 500 Perkin Elmer device comprising a gasoline chromatograph interfaced to a mass spectrometer (GC-MS) device.

# Results and Discussion

The results relating GC - MS evaluation brought about the identification of variety of compounds from the GC fractions of the ethanolic extract of decided on sample Neelan Samba. The compound prediction is based on Dr.Duke's Phytochemical and ethnobotanical Databases. The results found out that the presence of one,3-Propanediol, 2-ethyl-2-(hydroxymethyl)- (11.31%), 1,6-Anhydro-á-D-glucopyranose (levoglucosan) (17.25), 1,2-Benzenedicarboxylic acid, butyl octyl ester (0.9%), Hexadecanoic acid, ethyl ester (Palmitic acid, ethyl ester) (10.92%), 9,12- Octadecadienoic acid, methyl ester, (E,E)- (Linolelaidic acid, methyl ester) (10.92%), Oleic Acid (10.26%), Pentadecanoic acid, 2,6,10,14-tetramethyl- (0.81%), methyl ester, 3- Hexadecyloxycarbonyl-5-(2-hydroxyethyl)-four-methylimidazolium ion (0.80%), Didodecyl phthalate (8.69%), 1,2-15,16-Diepoxyhexadecane (0.98%), 6,11-Dimethyl-2,6,10-dodecatrien-1- ol (1.42%), 4-Isopropenyl-4,7-dimethyl-1-oxaspiro[2.5]octane (2.89%), 1b,5,five,6a-Tetramethyl- octahydro-1-oxa-cyclopropa[a]inden-6-one (3.10%), 7,11-Hexadecadienal (3.85%), Spiro[androst-5-ene-17,1'-cyclobutan]-2'-one3-hydroxy-, (3á,17á)- (8.58%),, cis-Z-à-Bisabolene epoxide (1.23%) and 2H-Pyran, 2-(7-heptadecynyloxy)tetrahydro-(6.08%). 9,12 -Octadecadienoic acid, methyl ester, (E,E)-to be a polyenoic fatty acid compound and it may be acts as an antihistaminic, hepatoprotective, hypocholesterolemic and antieczemic. Benzenedicarboxylic acid, diisooctyl ester to be a plasticizer compound, it could be acts as an antimicrobial and antifouling. 2H -Pyran, 2-(7-heptadecynyloxy) tetrahydro-to be a flavonoid fraction and it could be acts as an antimicrobial, 07b031025f5f96dfa8443f843db463b6 and antioxidant. Cis -Z-á- Bisabolene epoxide is a pheromone compound, it is able to be acts as to growth sex hormone activity. The organic sports of phytocomponents recognized in Neelan samba become tabulated in desk 2. The presence of diverse bioactive compounds confirms the application of selected pattern Neelan samba for numerous ailments through conventional practitioners. however, isolation of individual phytochemical materials may also continue to find a novel drug.

**Table 1 Components identified in the *Neelam samba*** [GC MS study]

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No.** | **RT** | **Name of the compound** | **Molecular Formula** | **MW** | **Peak Area %** |
| 1. | 8.25 | 1,3-Propanediol, 2-ethyl-2-(hydroxymethyl)- | C6H14O3 | 134 | 11.31 |
| 2. | 9.80 | 1,6-Anhydro-á-D-glucopyranose (levoglucosan) | C6H10O5 | 162 | 17.25 |
| 3. | 12.53 | 1,2-Benzenedicarboxylic acid, butyl octyl ester | C20H30O4 | 334 | 0.91 |
| 4. | 12.80 | Hexadecanoic acid, ethyl ester (Palmitic acid, ethyl ester) | C18H36O2 | 284 | 10.92 |
| 5. | 14.86 | 9,12-Octadecadienoic acid, methyl ester, (E,E)- (Linolelaidic acid, methyl ester) | C19H34O2 | 294 | 10.92 |
| 6. | 14.93 | Oleic Acid | C18H34O2 | 282 | 10.26 |
| 7. | 15.27 | Pentadecanoic acid, 2,6,10,14-tetramethyl-,methyl ester | C20H40O2 | 312 | 0.81 |
| 8. | 18.00 | 3-Hexadecyloxycarbonyl-5-(2-hydroxyethyl)-4- methylimidazolium ion | C24H45N2O3 | 409 | 0.80 |
| 9. | 19.96 | Didodecyl phthalate | C32H54O4 | 502 | 8.69 |
| 10. | 22.14 | 1,2-15,16-Diepoxyhexadecane | C16H30O2 | 254 | 0.98 |
| 11. | 23.66 | 6,11-Dimethyl-2,6,10-dodecatrien-1-ol | C14H24O | 208 | 1.42 |
| 12. | 28.50 | 4-Isopropenyl-4,7-dimethyl-1-oxaspiro[2.5]octane | C12H20O | 180 | 2.89 |
| 13. | 29.27 | 1b,5,5,6a-Tetramethyl-octahydro-1-oxa-cyclopropa[a]inden-6-one | C13H20O2 | 208 | 3.10 |
| 14. | 29.69 | 7,11-Hexadecadienal | C16H28O | 236 | 3.85 |
| 15. | 30.79 | Spiro[androst-5-ene-17,1'-cyclobutan]-2'-one, 3- hydroxy-, (3á,17á)- | C22H32O2 | 328 | 8.58 |
| 16. | 32.30 | cis-Z-à-Bisabolene epoxide | C15H24O | 220 | 1.23 |
| 17. | 33.55 | 2H-Pyran, 2-(7-heptadecynyloxy)tetrahydro- | C22H40O2 | 336 | 6.08 |

|  |  |  |
| --- | --- | --- |
| **No.** | **Name of the compound** | **Biological Activity** |
| 1. | 1,2-Benzenedicarboxylic acid, butyl octyl ester | Anti-inflammatory (Li et al., 2004) and antibacterial interest (Modupe et al.,2010). |
| 2. | Hexadecanoic acid, ethyl ester (Palmitic acid, ethyl ester) | Antioxidant, Hypocholesterolemic Nematicide, Pesticide,Lubricant, Antiandrogenic, flavor, Hemolytic five- Alpha reductase inhibitor (Rajeswari *et al., 2012*) |
| 3. | 9,12-Octadecadienoic acid, methyl ester, (E,E)- (Linolelaidic acid, methyl ester) | Antiinflammatory, Hypocholesterolemic, cancer preventive, Hepatoprotective, Nematicide Insectifuge, Antihistaminic, Antieczemic, Antiacne, five-Alpha reductase inhibitor Antiandrogenic,Antiarthritic, Anticoronary, Insectifuge (Rehana Banu and Nagarajan 2013 ) |
| 4. | Oleic Acid | Antitumor effect (Carrillo *et al., 2012* ) |
| 5. | Didodecyl phthalate | Antimicrobial activity (Ushadevi, 2008; Philip *et al.,* 2011; Senthilkumar et al., 2011; Shafaghat et al., 2012)Vasodilator, Angiotensin AT2 receptor antagonist, Uric acid excretion stimulant and Diuretic (Mallikadevi *et al., 2012*) |
| 6. | 1,2-15,16-Diepoxyhexadecane | Cytotoxicity (Murugesan Amudha andShanmugam Rani 2014) |
| 7. | 6,11-Dimethyl-2,6,10-dodecatrien-1-ol | Antimicrobial Activity (Mohan Das *et**al., 2013*) |
| 8. | cis-Z-à-Bisabolene epoxide | To boom intercourse hormone interest (Amutha Iswarya Devi and Kottai Muthu2014)  |
| 9. | 2H-Pyran, 2-(7-heptadecynyloxy)tetrahydro- | Antimicrobial , Antiinflammatory andAntioxidant (Anand and Gokulakrishnan 2012) |

****

**GCMS Chromatogram**

# Conclusion

Traditional rice has many extensive implications at the human health now not simplest in terms of food but additionally as a medication. Its function especially in stopping most cancers and Tumour is very essential inside the context of the current state of affairs. know-how of various types of its use as meals and in easy Nutraceutical formulations can serve as a tool in self-medicine and in curing many illnesses and disease situations among the populace.

This observation explores the goodness of the pattern Neelan samba which has a commendable feel of reason and may be cautioned as a plant of phytopharmaceutical significance. there's a want to now promote local meals as meals and medicine. The finer factors of these meals could similarly be used in designing practical meals.

# References

* Ahujal U, Ahujal S C, Thakrar R & Singh R K, Rice-A Nutraceutical, Asian Agri- History,12(2)(2008) 93-108.
* Amutha Iswarya Devi J and Kottai Muthu A 2014. Gas chromatography-mass spectrometry analysis of bioactive constituents in the ethanolic extract of

*Saccharum spontaneum* linn. Int J Pharm Pharm Sci, Vol 6, Suppl 2, 755-759.

* Anand T and Gokulakrishnan K 2012. Phytochemical Analysis of *Hybanthus enneaspermus* using UV, FTIR and GC- MS. IOSR Journal of Pharmacy Vol. 2, Issue 3, PP.520-524.
* Carrillo, del M. Cavia and Alonso-Torre S. R 2012. Antitumor effect of oleic acid; mechanisms of action. A review. Nutr Hosp. 27(5):1860-1865.
* Li EW Leach DN, Myers P, Leach GJ, Lin GD, Brushett DJ, Waterman PG (2004). Anti-inflammatory activity, cytotoxicity and active compounds of TinosporasmilacinaBenth. Phytother. Res. 18:78-83.
* Mallikadevi, T., Paulsamy S. Jamuna S and Karthika K (2012). Analysis for phytoceuticals and bioinformatics approach for the evaluation of therapetic properties of whole plant methanolic extract of *Mukia maderaspatana* (l.) M.roem. (cucurbitaceae) – a traditional medicinal plant in western districts of tamil nadu, india. Asian Journal of Pharmaceutical and Clinical Research. Vol 5, Issue 4, 163-168.
* Modupe O, Wesley O, Morufu A, Elizabeth AO (2010). Analysis of essential oil from the stem of Chansmanthera dependens. J. Nat. Prod. 3:47-53.
* Mohan Das N, Sivakama Sundari S, Karuppusamy S, Mohan VR, Parthipan B 2014. GC - MS analysis of leaf and stem bark of *Cleidion nitidum* (muell. – arg.) thw. ex kurz. (euphorbiaceae). Asian J Pharm Clin Res, Vol 7, Issue2, 2014, 41 - 47.
* Murugesan Amudha and Shanmugam Rani 2014. Assessing the bioactive constituents of *Cadaba fruticosa* (l.) Druce through GC-MS. Int J Pharm Pharm Sci, Vol 6, Issue 2, 383-385.
* Peter Werle, Marcus Morawietz, Stefan Lundmark, Kent Sörensen, Esko Karvinen, Juha Lehtonen “Alcohols, Polyhydric” in Ullmann’s Encyclopedia of Industrial Chemistry, Wiley-VCH, Weinheim, 2008.
* Philip D, Kaleena PK, VAlivittan K (2011). Gc-ms analysis and antibacterial activity of chromatographically separated pure fractions of leaves of *Sansevieria roxburghiana*. Asian J. Pharm. Clin. Res. 4:130-133.
* Rajeswari G, Murugan M and Mohan VR 2012. GC-MS analysis of bioactive

components of *Hugonia mystax* L. (Linaceae). Research Journal of Pharmaceutical, Biological and Chemical Sciences. Volume 3 Issue 4 Page 301- 308.

* Rehana Banu H and Nagarajan N 2013. GC-MS determination of bioactive components of *Wedelia chinensis* (Osbeck) Merrill. Journal of Chemical and Pharmaceutical Research, 2013, 5(4):279-285.
* Senthilkumar G, Madhanraj P, Panneerselvam A (2011). Studies on the Compounds and Its Antifungal Potentiality of Fungi Isolated From Paddy Field Soils of Jenbagapuram Village, Thanjavur District, and South India. Asian J. Pharm. Clin. Res. 1:19-21.
* Shafaghat A, Farshid S, Vahid mani-Hooshyar A (2012). Phytochemical and antimicrobial activities of *Lavandula officinalis* leave and stems against some pathogenic microorganisms. J. Med. Plants Res. 6:455-460.
* Ushadevi T (2008). Studies on the microfungal in the muthupet mangroves with emphasis on antimicrobial activity. Ph.D. Thesis, Trichirappalli, India: Bharathidasan University.