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Review

Gas Chromatography-Mass Spectroscopy Study of Essential Oil And Hydroalcoholic Extract Of Pandanus Amaryllifolius Roxb Leaves.

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	Abstract
Published on: 18 May 2024	<p>Pandanus amaryllifolius, an aromatic tropical plant belongs to the pandanaceae family, has gained much interest among researchers in the quest to develop further use of its essential oils beyond food flavoring, traditional medicines and limited food industries. The present investigation reports on the chemical composition of essential oil and hydroalcoholic extract. Phytochemical studies revealed of Pandanus amaryllifolius showed the presence of flavonoids and phenolic compounds. It exhibited antiviral, antioxidant, antihyperglycemic, anticancer, antimicrobial activities. The essential oil and hydroalcoholic extract reported six and thirty bioactive molecules respectively.</p>
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	Keywords: GC-MS bioactive molecules, Pandanus amaryllifolius.

INTRODUCTION

Pandanus amaryllifolius Roxb.ex Lindl., belongs to the Pandanaceae, native to South-east Asian countries [1]. The characteristic aroma of pandan is caused by the aroma compound 2-acetyl-1-pyrroline, found in the lower epidermal papillae [2]. The leaves of *P. amaryllifolius* have mild aroma and are widely used in South East Asia for flavouring in culinary purpose [3]. Taiwanese traditional system of medicine used this plant and its preparations to treat fever, severe jaundice, smallpox, headaches, fever, arthritis, diuretics, for skin and dental problems. The essential oil obtained from the leaf is used as stimulant, antispasmodic and effective against headaches, rheumatism, epilepsy and as a cure for sore throats. [4,5]

Phytochemical studies revealed of *Pandanus amaryllifolius* showed the presence of flavonoids and phenolic compounds[6]. It exhibited antiviral [7], antioxidant[8], antihyperglycemic[9], anticancer[10], antimicrobial activities[11]. The present investigation was carried out to identify bioactive molecules present in

essential oil and hydroalcoholic extract of *Pandanus amaryllifolius* by Gas chromatography-Mass spectroscopy analysis.

MATERIALS AND METHODS

Authentication and Collection

The leaf was identified and authenticated by a botanist DR.Stephen, Professor, Department of Botany, The American College, Madurai-625002. The herbarium of this specimen was kept in the department for further reference. Leaves were collected from a local garden in Erasanayakkanpatty village, Viralimalai Taluk, Pudukottai Dist, Tamil Nadu in the month of Nov 2023.

Isolation of essential oil from *Pandanus amaryllifolius*

Methods

The method was followed as per I.P[12]. Fresh leaves were cut into size of 4mm soaked with water, transferred to a round bottom flask, and was subjected to hydrodistillation method using clevenger apparatus. The oil obtain was found to be 1.3% w/v.

Preparation of hydroalcoholic extract of *Pandanus amaryllifolius* (HAEPA)

The powder of *Pandanus amaryllifolius* were extracted successively with hydroalcoholic extract using maceration process. The extracts were combined, concentrated, evaporated to dryness and the solid mass was noted, stored in an air-tight container. The essential oil and hydro alcoholic extract of *Pandanus amaryllifolius* were analysed by GC MS.

Gas chromatography-Mass Spectroscopy analysis

Gas chromatography-mass spectroscopy (GC-MS) analysis was conducted using 7890A gas chromatography with 5975 Series mass spectrometer (Agilent, American). A fused silica capillary HP-5 ms column was used for separation. Electron ionization system with ionization energy of 70 eV was used and helium gas as the carrier gas at a constant flow rate of 1 mL/min. The injector and mass transfer line temperatures were set at 250 °C and 300 °C, respectively, while the oven temperatures were set up from 50 °C to 200 °C at 8 °C/min. Plant samples were kept at isothermal for 20 minutes and finally raised to 300 °C at 10 °C/min. Diluted samples (1/100 v/v, in ethanol) of 0.2 µL each was manually injected in split-less mode. Identification of compounds was based on GC retention times registered on the capillary column, with computer matching of mass spectra with those of standards.

Application of the Essential oil and HAEPA

The sample was injected into the injected port of the GC device. The GC instrument vaporizes the sample and then separates and analyses the various components. Each component produces a specific spectral peak it may be recorded on a paper chart electron tube. The time elapsed between elution and injection is called the “retention time”. Differentiate between some compounds was identified using the retention time. The peak is measured from the base to the tip of the peak.[13,14]

Column

The GC-MS analysis of various organic crude extracts isolated from leaves of *Pandanus amaryllifolius* was performed using a Perkin Elmer GC-MS (Model Perkin Elmer Clarus 500, USA) equipped with a VF-5 MS fused silica capillary column 30m× 0.25 mm i.d., film thickness of 0.25 µm) operating in an electron impact mode at 70eV ; helium (99.999%) was used as a carrier gas at a constant flow of 1.5ml/minute.

Condition

Injection volume-1µL through auto sampler split ratio-10:1, injection temperature 2400°C, ion source temperature 2000°C, oven temperature was programmed from 700°C (isothermal for 2 minutes), with an increase of 100°C/minutes to 3000°C/minutes, ending with a 9 minutes isothermal at 3000°C. Mass spectra were taken at 70eV ; with a scan range of 40- 1000 m/z .solvent cut time was 5 minutes ; MS start time was 5 minutes; MS end time was 35 minutes; Ion source temperature was set to 2000°C and the interface temperature was 2400°C [15].

Identification of bioactive compounds

Bioactive molecules from the essential oil and hydroalcoholic extract of *pandanus amaryllifolius* plant were identified based on retention time . The interpretation of the mass spectrum of GC- MS was done using the database of the National Institute of standards and technology (NIST 2017) .The compound name, retention time, percentage area,molecular formula, molecular weight, were ascertained. The peak showed by Gas chromatography-Mass spectroscopy of hydroalcoholic leaf extract and isolated oil of *Pandanus amaryllifolius*

represents the presence of the secondary phytochemical compounds such as alkaloids, glycoside, terpene, fatty acids and it's esters.

RESULTS AND DISCUSSION

Gas chromatography-Mass spectroscopy is one of the best technique to identify the bioactive molecules of long- chain hydrocarbons, alcohols, acids,esters, alkaloids, steroids, amino and nitro compounds. Hence, Gas chromatography (GC) and Mass spectroscopy (MS) associated with particular detection techniques have become sophisticated means for analysis of various compounds.

Gas chromatography-Mass spectroscopy chromatogram of the essential oil and hydroalcoholic extract of *Pandanus amaryllifolius* showed peaks six and thirty respectively. Its chromatogram was displayed in fig 1&2 and its molecule name, retention time, percentage area, molecular formula and molecular weight and its bioactivity was depicted in table1,2 &3,4 respectively.

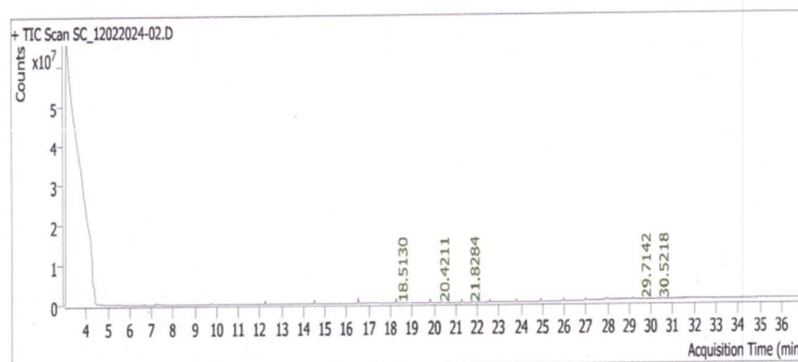


Fig 1: Gas chromatography- Mass Spectroscopy of *pandanus amaryllifolius* leaf essential oil

Table 1: Phytoconstituents present in the essential oil of *Pandanus amaryllifolius*

S.no	Name of the compound	RT	Area %	Molecular formula	Molecular weight
1.	1,8-Naphthyridine,1,2,3,4,4a,5,6,7-octahydro-2,2,4a,7,7-pentamethyl-,8-oxide	18.5130	0.402	C ₈ H ₆ N ₂	130.150
2.	Octasiloxane, 1,1,3,3,5,5,7,7,9,9,11,11,13,13,15,15-hexadecamethyl-	18.8874	0.352	O ₇ Si ₈	336.68
3.	Isogibberellin A3, 2TMS derivative	20.4211	0.298	C ₁₉ H ₂₂ O ₆	346.34
4.	Isogibberellin A3, 2TMS derivative	29.7142	0.351	C ₁₉ H ₂₂ O ₆	346.34
5.	2-Butenoic acid, 2-methyl-, 1,1a,1b,4,4a,5,7a,7b,8,9-decahydro-4a, 7b-dihydroxy-3-(hydroxymethyl)-1,1,6,8-tetramethyl-5-oxo-9aH-cyclopropa[3,4]benz[1,2-e]azulene-9-9a-diyl ester, [1aR-[1a.alpha., 1b.beta., 4a.beta.,7a.alpha.,7b.alpha.,8.alpha.,9.beta.(E)9a.alpha.(E)]]-	29.7142	0.060	C ₃₀ H ₄₀ O ₈	528.63
6.	Octasiloxane, 1,1,3,3,5,5,7,7,9,9,11,11,13,13,15,15-hexadecamethyl-	30.5218	0.832	O ₇ Si ₈	336.68

Table 2: Bioactivity compounds in essential oil of *Pandanus amaryllifolius*

S.no	Name of the compound	Nature of the compound	Activity
1.	1,8-Naphthyridine,1,2,3,4,4a,5,6,7-octahydro-2,2,4a,7,7-pentamethyl-,8-oxide	Napthalene derivative	Antimicrobial, HIV inhibitor, anticancer, anti-

			inflammatory analgesic activity, Alzheimer's disease, multiple sclerosis, and depression.[16]
2.	Octasiloxane, 1,1,3,3,5,5,7,7,9,9,11,11,13,13,15,15-hexadecamethyl-	Organosilicone	Organic solvent [17]
3.	Isogibberellin A3, 2TMS derivative	Tetracyclic diterpenoid acid	Plant growth hormone [18]
4.	Isogibberellin A3, 2TMS derivative	Tetracyclic diterpenoid acid	Plant growth hormone [18]
5.	2-Butenoic acid, 2-methyl-, 1,1a,1b,4,4a,5,7a,7b,8,9-decahydro-4a, 7b-dihydroxy-3-(hydroxymethyl)-1,1,6,8-tetramethyl-5-oxo-9aH-cyclopropa[3,4]benz[1,2-e]azulene-9-9a-diyl ester, [1aR-[1a.alpha., 1b.beta., 4a.beta.,7a.alpha.,7b.alpha.,8.alpha., 9.beta.(E)9a.alpha.(E)]]-	Saturated fatty acid derivative	Artificial flavouring agent, Disinfectant [19]
6.	Octasiloxane, 1,1,3,3,5,5,7,7,9,9,11,11,13,13,15,15-hexadecamethyl-	Organosilicone	Organic solvent [17]

The major bioactive compounds identified in *P. amaryllifolius* were 1,8-Naphthyridine, 1,2,3,4,4a,5,6,7-octahydro-2,2,4a,7,7-pentamethyl-,8-oxide(RT-18.5130;0.402%),Octasiloxane, 1,1,3,3,5,5,7,7,9,9,11,11,13,13,15,15-hexadecamethyl-(RT-18.8874;0.352%), Isogibberellin A3, 2TMS derivative (RT-20.4211;0.298%), Isogibberellin A3, 2TMS derivative (RT-29.7142;0.351%), 2-Butenoic acid, 2-methyl-, 1,1a,1b,4,4a,5,7a,7b,8,9-decahydro-4a, 7b-dihydroxy-3-(hydroxymethyl)-1,1,6,8-tetramethyl-5-oxo-9aH-cyclopropa[3,4]benz[1,2-e]azulene-9-9adiylester,[1aR[1a.alpha.,1b.beta.,4a.beta.,7a.alpha.,7b.alpha.,8.alpha.,9.beta.(E),9a.alpha.(E)]]-(RT-297142;0.060%),Octasiloxane,1,1,3,3,5,5,7,7,9,9,11,11,13,13,15,15-hexadecamethyl-(RT-30.5218;0.832%).

1,8-Naphthyridine,1,2,3,4,4a,5,6,7-octahydro-2,2,4a,7,7-pentamethyl-,8-oxide Naphthalene derivative, exhibits antimicrobial, anticancer, anti-inflammatory HIV inhibitor, alzheimer's disease, multiple sclerosis depression and analgesic activity[16]. Organosilicone derivative octasiloxane, 1,1,3,3,5,5,7,7,9,9,11,11,13,13,15,15-hexadecamethyl Organosilicone derivative, used as an organic solvent[17]. Isogibberellin A3, 2TMS derivative is a plant growth hormone [18]. 2-Butenoic acid, 2-methyl-,1,1a,1b,4,4a,5,7a,7b,8,9-decahydro-4a,7b-dihydroxy-3-(hydroxymethyl)-1,1,6,8-tetramethyl-5-oxo-9acyclopropa[3,4]benz[1,2-e]azulene-9-9a-diyl ester, [1aR-[1a.alpha., 1b.beta., 4a.beta.,7a.alpha.,7b.alpha., 8.alpha.,9.beta.(E), 9a.alpha.(E)]] is Saturated fatty acid derivative, used as an artificial flavouring agent, disinfectant[19].

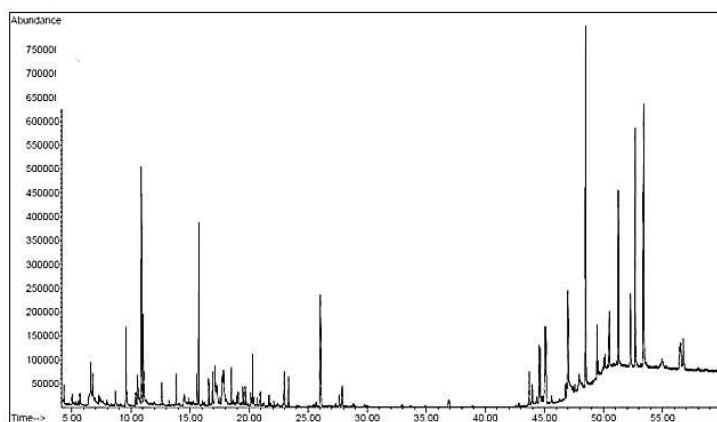


Fig 2: Gas chromatography-Mass Spectroscopy of Hydroalcoholic extract of *Pandanus amaryllifolius*

Table 3: Phytoconstituents present in the hydroalcoholic extract of *Pandanus amaryllifolius*

S.No	Name of the compound	RT	Area %	Molecular formula	Molecular weight
1.	Methoxyamine	4.320	0.17	CH ₃ ONH ₂	47.057
2.	2-cyclopentene-1,4 dione	5.014	0.11	C ₅ H ₄ O ₂	96.084
3.	1,2- cyclopentanedione	5.665	0.00	C ₅ H ₆ O ₂	98.10
4.	3 -methylcyclopentanone	6.576	0.00	C ₆ H ₁₀ O	98.14
5.	2- methyl-2-pental	6.586	2.05	C ₆ H ₁₀ O	98.14
6.	α -hydroxy- γ -butyrolactone	6.766	0.75	C ₄ H ₆ O ₃	102.09
7.	Dimethylguanidine	8.678	0.00	C ₃ H ₉ N ₃	87.12
8.	Pyranone	9.583	1.74	C ₁₀ H ₅ NO ₃	187.15
9.	Catechol	10.59	0.81	C ₆ H ₆ O ₂	110.34
10.	Coumaran	10.88	5.31	C ₈ H ₈ O	120.15
11.	Triethylene glycol	11.05	2.14	C ₆ H ₁₄ O ₄	150.174
12.	2-Methoxy-4-vinyl phenol	12.61	0.44	C ₉ H ₁₀ O ₂	150.177
13.	Dimethyl laurylamine	15.58	0.56	C ₁₄ H ₃₁ N	213.4
14.	Purpurogallin	46.99	2.01	C ₁₁ H ₈ O ₅	220.17
15.	Flufylline	46.99	4.56	C ₂₁ H ₂₄ N ₅ O ₃	413.48
16.	Icosane	47.09	0.00	C ₂₀ H ₄₂	282.547
17.	Octadecane	48.18	0.00	C ₁₈ H ₃₈	254.494
18.	squalene	48.48	14.4	C ₃₀ H ₅₀	410.730
19.	1-Bromoicosane	49.12	0.00	C ₂₀ H ₄₁ Br	361.4
20.	Crotocin	49.45	0.92	C ₁₉ H ₂₄ O ₅	332.4
21.	β tocopherol	50.47	1.07	C ₂₈ H ₄₈ O ₂	416.68
22.	Vitamin E	51.25	3.66	C ₂₈ H ₄₈ O ₂	416.68
23.	Stigma sterol	52.67	6.73	C ₂₉ H ₄₈ O	412.69
24.	Methyltrimethicone	52.67	0.00	C ₁₀ H ₃₀ O ₃ S ₁₄	310.687
25.	Pinane	20.31	0.94	C ₁₀ H ₁₈	138.25
26.	Methyl Palmitic acid	21.67	0.27	C ₁₇ H ₃₄ O ₂	270.45
27.	Ethyl palmitic acid	22.98	1.04	C ₁₈ H ₃₆ O ₂	284.48
28.	Phytol	26.02	4.35	C ₂₀ H ₄₀ O	296.53
29.	5-methyl-2-phenyl-1H indole	52.29	2.37	C ₁₅ H ₁₃ N	207.27
30.	1,8-Naphthyridine, 1,2,3,4,4a,5,6,7-octahydro- 2,2,4a,7,7-pentamethyl-,8-oxide	18.51	0.402	C ₈ H ₆ N ₂	130.150

Table 4: Bioactive compounds in the hydroalcoholic extract of *Pandanus amaryllifolius*

S.No	Name of the compound	Nature of the compound	Activity
1.	Methoxyamine	Hydroxylamine derivatiive	Anticancer activity[20]
2.	2-cyclopentene-1,4 dione	Cycloalkene	Extraction and purification and synthesis in pharmaceutical areas[21]
3.	1,2- cyclopentanedione	Cycloalkene	Anti-inflammatory effect[22]
4.	3 -methylcyclopentanone	Cycloalkane	Anticancer[23]
5.	2- methyl-2-pental	Terpenoids	Flavoring agent, Food additive[24]
6.	α -hydroxy- γ -butyrolactone	4 carbon lactone	Diuretics, anticancer, contraceptive drugs[25]
7.	Dimethylguanidine	Amidine derivatives	Anticancer and antimicrobial agent[26]
8.	Pyranone	Unsaturated cyclic ester	Treatment of diabetes, antibacterial agent[27]
9.	Catechol	Dihydroxy benzene	Used as a reagent in photography, dyeing fur, rubber and plastic production.[28]
10.	Coumaran	Benzofuran derivatives	Acetylcholinesterase inhibitor with antileishmanial activity[29]

11.	Triethylene glycol	Dihydroxy alcohol	Disinfectant toward a variety of bacteria, influenza virus.[30]
12.	2-Methoxy-4-vinyl phenol	Phenol derivative	Flavouring agent for the natural aroma of buck wheat[31]
13.	Dimethyl laurylamine	Quaternary ammonium compound	Surfactant, antimicrobial properties, disinfectant.[32]
14.	Purpurogallin	Aglycone natural product	Anti cancer, Antioxidant[33]
15.	Flufylline	Theophylline derivatives	Used in cardiovascular disease and asthma[34]
16.	Icosane	Alkane	It can be detected in the body odor of the patient suffering from Parkinson disease.[35]
17.	Octadecane	Alkane hydrocarbon	Antioxidant, Antimicrobial agents[36]
18.	Squalene	Polyunsaturated Triterpene	Cholesterol lowering agent[37]
19.	1-Bromoicosane	Bromoalkane	Organic solvent[38]
20.	Crotocin	Trichothecenes	Neuromuscular blocking drug[39]
21.	β tocopherol	Fat soluble vitamin	Anti-oxidant[40]
22.	Vitamin E	Fat soluble vitamin	Inhibit cyclooxygenase, anti-inflammatory[41]
23.	Stigma sterol	Tetracyclic triterpene	Analgesic, Anti-diabetic effect[42]
24.	Methyltrimethicone	Volatile silicone	Deodorant and antiperspirant.[43]
25.	Pinane	Isomeric terpenes	Antimicrobial, anti tumour , antibiotic properties[44]
26.	Methyl Palmitic acid	Unsaturated fatty acid	Antiinflammatory, anti-fibrotic effect[45]
27.	Ethyl palmitic acid	Unsaturated fatty acid	Hair and skin conditioning agent[46]
28.	Phytol	Acyclic diterpene alcohol	Precursor of vit E, cosmetic preparation, antioxidant, anti-inflammatory, anti-allergic[47]
29.	5-methyl-2-phenyl-1H indole	Indole derivative	Chromogenic agent[48]
30.	1,8-Naphthyridine,1,2,3,4,4a,5,6,7-octahydro-2,2,4a,7,7-pentamethyl-,8-oxide	Napthalene derivatives	Antimicrobial, HIV inhibitor, anticancer, anti-inflammatory analgesic activity, Alzheimer's disease, multiple sclerosis, and depression.[16]

Methoxyamine(RT-4.320;0.17%),2-Cyclopentene-1,4-dione(RT-5.014;0.11%), 1,2Cyclopentanedione (RT-5.665;0.00%), 3-Methylcyclopentanone(RT-6.576;0.00%), 2-Methyl-2-pentenal(RT-6.586;2.05%), α -hydroxy- γ -butyrolactone (RT-6.766;0.75%), Dimethylguanidine (RT-8.678;0.00%), Pyranone (RT-9.583;1.74%), Catechol (RT-10.588;0.81%),Coumaran (RT-10.881;5.31%), Triethylene glycol (RT-11.050;2.14%), 2-Methoxy-4-vinyl phenol (RT-12.612;0.44%), Dimethyl laurylamine (RT-15.583;0.56%), Purpurogallin (RT-46.995;2.01%), Flufylline (RT-46.995;4.56%), Icosane (RT-47.090;0.00%), Octadecane (RT-48.186;0.00%), squalene (RT-48.488;14.14%), 1-Bromoicosane (RT-49.124;0.00%), Crotocin (RT-49.452;0.92%), β tocopherol (RT-50.474;1.07%), Vitamin E (RT-51.252;3.66%), Stigma sterol (RT-52.671;6.73%), Methyltrimethicone (RT-52.677;0.00%), Pinane (RT-20.312;0.94%), Methyl Palmitic acid (RT-21.678;0.27%), Ethyl palmitic acid (RT-22.981;1.04%), Phytol (RT-26.025;4.35%), 5-methyl-2-phenyl-1H indole (RT-52.290;2.37%).

Methoxyamine, Hydroxylamine derivative exhibit anticancer activity[20]. 2-cyclopentene-1,4 dione, cycloalkene derivative used in extraction and purification and synthesis in pharmaceutical areas[21]. Cycloalkene derivative - 1,2- cyclopentanedione exhibit anti-inflammatory effect[22]. 3 -methylcyclopentanone cycloalkane derivative has anticancer effect[23].2- methyl-2, terpenoids derivative - pentenal used as a flavoring agent, Food additive[24]. 4 carbon lactone derivative - α -hydroxy- γ -butyrolactone used as diuretics, anticancer, contraceptive drugs[25]. Dimethylguanidine an amidine derivatives used as an anticancer and antimicrobial agent[26]. Pyranone,an unsaturated cyclic ester used for treatment of diabetes, antibacterial agent[27]. Catechol dihydroxy

benzene derivative used as a reagent in photography, dying fur, rubber and plastic production.[28]

Coumaran benzofuran derivatives has acetylcholinesterase inhibitor with antileishmanial activity, immunomodulatory activity[29]. Triethylene glycol dihydroxy alcohol derivative disinfectant toward a variety of bacteria, influenza virus[30]. Phenol derivative - 2-Methoxy-4-vinyl phenol used as flavouring agent for the natural aroma of buck wheat[31]. Dimethyl laurylamine Quaternary ammonium compound derivative used as surfactant, antimicrobial properties, disinfectant[32]. Purpurogallin an aglycone natural product derivative, has anti cancer, antioxidant, anti-inflammatory[33]. Flufylline theophylline derivatives used in cardiovascular disease and asthma, phosphodiesterase (PDE) inhibitor[34]. Icosane alkane derivative, it can be detected in the body odor of the patient suffering from parkinson disease.[35]. Octadecane alkane hydrocarbon, exhibit antioxidant, antimicrobial agents[36]. Squalene Polyunsaturated Triterpene used as an chloesterol lowering agent, adjunctive therapy in a variety of cancers[37]. 1-Bromoicosane Bromoalkane derivative, used as an organic solvent[38]. Crocacin Trichothecenes derivatives, used as an neuromuscular blocking drug[39]. β tocopherol Fat soluble vitamin, as an anti-oxidant[40]. Vitamin E Fat soluble vitamin, inhibit cyclooxygenase, anti-inflammatory[41]. Stigma sterol Tetracyclic triterpene, as an analgesic, anti-diabetic effect[42]. Methyltrimethicone Volatile silicone used as an deodorant and antiperspirant[43]. Pinane Isomeric terpenes as an antimicrobial, anti tumour, antibiotic properties[44]. Methyl Palmitic acid Unsaturated fatty acid as an anti-inflammatory, anti-fibrotic effect[45]. Ethyl palmitic acid Unsaturated fatty acid as an hair and skin conditioning agent[46]. Phytol Acyclic diterpene alcohol as an Precursor of vit E, cosmetic preparation, antioxidant, anti-inflammatory, anti-allergic[47]. 5-methyl-2-phenyl-1H indole Indole derivative as Chromogenic agent[48]. 1,8-Naphthyridine,1,2,3,4,4a,5,6,7-octahydro-2,2,4a,7,7-pentamethyl-,8-oxide Naphthalene derivative-exhibits antimicrobial, anticancer, anti-inflammatory HIV inhibitor, alzheimer's disease, multiple sclerosis depression and analgesic activity[16]. GC-MS analysis of essential oil and hydroalcoholic leaf extract of *Pandanus amaryllifolius* showed six and thirty compounds respectively. Among the identified compounds 1,8-Naphthyridine,1,2,3,4,4a,5,6,7-octahydro-2,2,4a,7,7-pentamethyl-,8-oxide is present in both essential oil and extract. highlights the pharmaceutical importance of the plant. The identified bioactive compounds occupy many biological properties. The presence Vitamin E is one of the major compounds detected in the hydroalcoholic leaf extract has been found to exhibit antioxidant, anti-inflammatory, antimicrobial activity. Vitamin E prevents lipid peroxidation and function as an antioxidant, its role in anti-inflammatory processes, its inhibition of platelet aggregation and its immune enhancing activity.

CONCLUSION

Gas chromatography-Mass spectroscopy analysis of essential oil and hydroalcoholic leaf extract of *Pandanus amaryllifolius* reported the presence of bioactive molecules namely fatty acids, heterocyclic compounds, steroids, terpenoids and vitamins. Among the identified compounds 1,8-Naphthyridine, 1,2,3,4,4a,5,6,7-octahydro-2,2,4a,7,7-pentamethyl-,8-oxide was present in both essential oil and hydroalcoholic extract of *Pandanus amaryllifolius*. 1,8-Naphthyridine,1,2,3,4,4a,5,6,7-octahydro-2,2,4a,7,7-pentamethyl-,8-oxide, Vitamin E, Methoxyamine are the major compounds that might contribute to biological activities such as antimicrobial, HIV inhibitor, anticancer, anti-inflammatory analgesic activity, Alzheimer's disease, multiple sclerosis, and depression, inhibit cyclooxygenase, anti-inflammatory, antioxidant, antitumour (alkylating agent) respectively. As a consequence, the present study results conclude that *Pandanus amaryllifolius* may serve as a potent source of medicinal activity due to the presence of bio-active compounds. Still, further studies are essential to isolate, characterize and purify the active components responsible for therapeutic activity.

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