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Assessment of Physicochemical, Phytochemical Investigation and In-vitro Antioxidant Activity of flowers extract Jasminum mesnyi (Hance)

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ABSTRACT:
Plants have served human beings as a natural source for treatments and therapies from ancient times, amongst them medicinal herbs have gain attention because of its wide use and less side effects. Jasminum mesnyi Hance is a well-known plant in the traditional medicine. In the present study the Physiochemical, phytochemical and antioxidants Activity of the methanol and water extract of Jasminum mesnyi Hance flowers were investigated. The medicinal properties of Jasminum plants may be due to the presence of a broad spectrum of bioactive compounds.

In this paper, the physicochemical evaluations carried out in terms of loss on drying, ash value, extractive values and acid insoluble ash value and fluorescence behavior of flower powder were also determined etc. Qualitative analysis of various phytochemical constituents and quantitative analysis of total phenolics compound and flavonoids were determined by the well-known test protocol available in the literature. Quantitative analysis of phenolic and flavonoids was carried out by Folins Ciocalteau reagent method and aluminum chloride method respectively. Each extract was subjected to qualitative tests for identification of various constituents like flavonoids, saponins, tannins, Steroidal glycosides, Triterpenoids, Reducing Sugar, Phenolic compound, steroids, Amino acid and Protein. The In-vitro antioxidant activity of methanolic extract and aqueous extract of the flowers was assessed against DPPH assay method using standard protocols. Methanolic extract has the richest content of both phenolics and flavonoids i.e. (465.94± 0.17mg GAE/g and 445.24 ± 0.16 mg QE/g) respectively, and aqueous extract was the least i.e. (335.20± 0.35mg GAE/g and 323.72± 0.23 mg QE/g) IC_{50} for standard ascorbic acid was found to be 0.092µg/ml and for methanol and aqueous extract flower was found to be 0.317µg/ml and 0.485 µg/ml respectively. The standard drug ascorbic acid scavenged DPPH radical was found to be 0.313. The DPPH radical scavenging activity of Jasminum mesnyi was evaluated and compared with ascorbic acid. The presence inhibition of flowers extract was calculated at various concentration (20, 40, 60 ,80, ,100 etc.) as well as standard ascorbic acid. The highest scavenging activity of ethanolic and aqueous extract were 0.485 % and 0.906 % at concentration of 100 µg/ml. The high contents of phenolic compounds of Jasminum mesnyi indicated that these compounds contribute to the antioxidant activity and can be regarded as promising plant species for natural sources of radical scavenging activity with potential value for treatment of many life-threatening diseases.

The present study will be useful for its identification prior to carrying out further research work. The findings of this study will facilitate pharmacognostic standardization of the plant material and aid in the preparation of a herbal monograph for the species.

Keywords: Jasminum mesnyi, Physicochemical, Qualitative, Quantitative phytochemical, DPPH radical scavenging activity, antioxidant activity.

I. INTRODUCTION

Nature has all the resources to heal every ailment of human body. From ancient time plants and plant products have played very important role as medicines. Herbal medicines are rich source of

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therapeutic agents in all over the world and are having higher safety margins with lesser costs. Herbal plants are pioneer for new drug discovery and development, not only for plant constituents used directly as therapeutic agents, but also as precursor for half of the clinical drugs available in the market [1]. The herbal plants are used for the prevention and treatment of various ailments in the developing countries due to their availability to the native people and heavy cost factor of clinical drugs.

Medicinal plants constitute immense amount of raw materials for the synthesis of medicines, cosmetics and perfumes. In modern times plant derived natural products have been isolated for drug discovery and development. In the present scenario, research on plant materials for their therapeutic value is growing exponentially due to its lesser side effects compared to other systems of medicines.

Plants have been a major source of medicines, either in the form of extemporaneous preparations or as pure active molecules [2]. Plant-based compounds and formulations for treatment of various ailments are becoming common place in society. Moreover, 75–80% of the world's population in developing countries continues to use herbal medicines for primary healthcare.

The medicinal properties in plants come from non-nutrient chemical compounds, namely phytochemical compounds, which have a role as a self-defense mechanism against the surrounding environment [3]. One of the important roles of phytochemicals is as an antioxidant. Antioxidants are molecules that can neutralize reactive radicals that become less active by accepting or donating electrons to prevent oxidative stress in the body [4-5]. Plants are the potential source of natural antioxidants; antioxidants are molecules that inhibit harmful free radicals and Reactive Oxygen Species (ROS) and delay or inhibit cellular damage [6]. Free radicals are molecular species or atoms which contain one or more unpaired electrons, these are constantly produced in the human body as a result of cell metabolism [7].

Oxidative stress (OS) plays a major role in weaken and destruction all cells and organs of human, therefore injury and development of degenerative ailments and chronic diseases such as arthritis, aging, autoimmune disorders, neurodegenerative, cardiovascular disorders and cancer [8]. Although cells are equipped with an impressive antioxidant enzyme as well as non-enzymatic small antioxidant molecules, these agents may not be enough to normalize the redox status under oxidative stress caused under adverse physicochemical, environmental or pathological conditions, when either the generation of free radicals is enhanced or their scavenging is inhibited. Under these circumstances supplementation with exogenous antioxidants is required to restore the redox homeostasis in cells [9].

However, loss of balance between pro-oxidants and antioxidants results in oxidative stress. High levels of ROS in biological cells have a large impact on their functioning, leading to deficient cell operation, aging, or disease [10]. It is evident that plant extracts have diverse bioactivities such as anti-allergic, anti-inflammatory, antioxidant, antimicrobial, anti-fungal, antiviral, antidiabetic and anti-cancer properties [11]. Antioxidants inhibit the chain reaction of oxidation, acting as hydrogen donors or acceptors of free radicals, generating stabler radicals. The antioxidants in this group mainly have a phenolic structure and include the following: antioxidant minerals, antioxidant vitamins and phytochemicals, among which are flavonoids, catechins, carotenoids, β-carotene, lycopene, diterpene and their derivatives. These compounds interact by a variety of mechanisms including quenching ROS, binding of metal ions, scavenging free radicals, inhibiting oxidative enzymes, converting hydroperoxides to non-radical species, absorbing UV radiation or deactivating singlet oxygen. The efficiency of antioxidant compounds depends on several factors such as; structural properties, temperature, the characteristics of the substrate susceptible to oxidation, concentration and localization in the system, the presence of synergistic and pro-oxidant compounds and the physical state of the compounds [12-14].

In general, treatment involving herbal drugs spans a long duration of time. In contrast to general old age myth that herbal drugs are safe and do not have toxic effects, these drugs may cause some moderate to severe side effects due to complex nature of their chemical compositions. Hence, there is a need to establish safety to herbal drugs.

Jasminum mesnyi Hance (primrose jasmine, sansonae, peelimalati and peelichameli) Oleaceae family is a native herb of the Himalayan region and is an evergreen shrub with long and slender arching stems that climb like a sprawling vine [15]. The crude drug is used in various antidiabetic formulations like “Pahari Butti” to

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lower down the blood glucose level especially in Himalayan ranges like in Solan, India. Jasminum mesnyi Hance (Jasminum primulinum Hemsley) also known as "Primrose Jasmine" or "Japanese Jasmine" is found in tropical, sub-tropical and warm temperate regions of Asia continent. It is trailing evergreen shrub with long and lean arching stems that scale up like a rambling creeper. Leaves are trifoliolate, opposite and attached at the base of branchlets. Flowers are having 6-10 petals arranged in a semidouble whorl, usually axillary or rarely terminal, solitary and yellow coloured [16-17]. The Jasminum is the major genus of Oleaceae family and an important group of flowering plants, commonly cultivated for their aromatic flowers. Traditionally many species are used as depurative, analgesic, diuretic, antiseptic, expectorant, anti-depressant, and sedative agents and to cure cough, hysteria, uterine ailments, and partum problems. Jasmine species also finds place in cosmetics and used for making perfumes and scents [18].

The major constituents present in this plant include βsitosterol, α-amyrin, β- glucoside and flavonoids which are also present in Jasminum rigidum are used as antidiabetic agent in folklore medicinal system of India. The other constituents reported in Jasminum mesnyi include rutin and secoiridoid glucosides like 9–hydroxyjasminoside, 9-hydroxy jasminosidic acid and jasmin 10-O-βglucoside [19] and two new secoiridoid glucoside, Jasmoside and jasminoside [20]. However, its medicinal uses are not reported widely and its constituents are being investigated for many pharmacological properties and for potential in human medicine.

II. MATERIALS AND METHODS

2.1 Plant Collection and Authentication:

Jasminum mesnyi flowers were collected from the Botanical Garden of Govt. Shyama Prasad Mukherjee P.G. College Sitapur Surguja. The plants were authenticated by Prof. Rijwan Ulla, Department of Botany, Rajeev Gandhi Govt. Autonomous Post Graduate College Ambikapur, Surguja, Chhattisgarh, India. The plant materials were dried under shade by placing in a single layer and coarsely powdered by hand mixer and pass through sieve no 60.

2.2 Preparation of Extract

The collected samples were washed with clean water and dried in the shed for about three weeks. The dry samples were chopped into pieces and ground into powder by using a mechanical grinder. The powdered materials were stored in clean plastic bottles until the use. The materials were subjected to Soxhlet's extraction using methanol and aqueous solvent. The extracts were concentrated in a rotary evaporator. The extracts were stored at 4˚C, till used for analysis.

2.3 Physicochemical analysis

The flowers were shade dried and powdered using a mechanical grinder for powder analysis. The physicochemical characteristics of powdered flowers were determined as per the WHO guidelines [21]. Physicochemical parameters include loss on drying, water content, total ash content, acid-insoluble ash content, water-soluble ash content, water-soluble extract content, and methanol-soluble content.

The fluorescence characteristics of the plant material in different solvents were observed using visible, short UV, and long UV light [22]. Fluorescence behavior of leave powder and different extract with different chemical reagents such as sodium hydroxide, hydrochloric acid, nitric acid, and sulphuric acid was analyzed to detect the occurrence of phytoconstituents along with colour changes. The behavior of leaves power with different reagent and tested the staining of leaves power. A fluorescence study was performed as per standard procedure [23-27].

(i) Determination of loss on drying (LOD)

LOD was determined by gravimetric determination. 2–5 g of sample was placed in crucible porcelain, dried at 105 °C for 60 min, then moved into a desiccator. This process was repeated until the constant weight was achieved. LOD was expressed as gram per gram of air-dried

(ii) Determination of water content

Water content was determined by gravimetric method. 1 g of sample was heated in the oven at 105ºC for 5 h, and then weighed. The process was continued with 1 h intervals until the difference between 2 consecutive weighing's is not more than 0.25%.

(iii) Determination of total ash content

1 g of sample was placed in a silicate crucible and weighed. Sample was spread in an even layer in the crucible, and the material ignited by gradually increasing the heat to 500–600 °C until free from carbon, cooled in a desiccator, and

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weighed. Repeatedly until a fixed weight is obtained.

(iv) Determination of acid-insoluble ash content

Ash obtained from ash content testing was boiled with 25 mL HCl (~70 g/l) TS for 5 min. The ash is filtered with non-ash filter paper and washed with 5 mL hot water. The insoluble matter was transferred to the crucible, dried on a hot-plate and ignited to constant weight, and placed in a desiccator for 30 min, then weighed without delay. Content of acid-insoluble ash is calculated in mg per g of air-dried material.

(v) Determination of water-soluble ash content

Containers containing total ash were added with 25 mL of water and boiled for 5 min. Material that does not soluble is collected into a glass cup or ashless filter paper. Then, it was washed with hot water and ignited in a cup for 15 min at a temperature of 450 °C until the weight remained. The reduction of the residue weight in mg is total ash weight. The water-soluble ash is calculated in mg per g of air-dried material.

(vi) Determination of water- and methanol-soluble extract

5 g of extract was macerated with 100 mL of water for 6 h for water-soluble extract determination, and then saturated with $CHCl_3$. For ethanol-soluble determination, it was macerated with ethanol. They were shaken frequently, and allowed to stand for 18 h. The extract produced was filtered and poured into a volumetric flask. 20 mL of extract was transferred to a porcelain cup, evaporated until dry. The residue was heated using an oven at 105 °C to receive constant weight. The soluble extract was calculated in g per g of air-dried material.

2.4 Phytochemical evaluation:

Each extract was subjected to qualitative tests for identification of various constituents like alkaloids, carbohydrates, glycosides, anthraquinone glycosides, steroids, saponins, flavonoids, tannins and phenolic compounds and proteins. The preliminary phytochemical screenings of extracts were performed according to standard procedure[28-32].

(i) **Detection of alkaloids:** To a small portion of extracts, few drops of dilute HCl were added separately and filtered. The filtrates were tested with various reagents such as Mayer's, Dragandroff's, Hager's, and Wagner's to detect the presence of alkaloids.

(ii) **Detection of carbohydrates:** Small quantities of extracts were subjected to Molish's test, Fehling's test, Benedict's test and Iodine test.

(iii) **Detection of glycosides:** To the extracts few drops of dilute HCl were added and heated on water-bath for hydrolysis and extracts were separately subjected to Legal's tests, Borntrager test to detect the presence of glycosides.

(iv) **Detection of anthraquinone glycosides:** To the extracts few drops of ferric chloride solution and dilute HCl were added, heated on water-bath for hydrolysis. The content were filtered, few ml of chloroform were added to the filtrate and shaken well. The organic layer was separated and a few drops of ammonia solution was added to it and shaken slightly. The test tube was kept aside, lower organic layer showing pink colour indicated the presence of anthraquinone glycosides.

(v) **Detection of steroids:** Small amounts of extracts were subjected to Salkowaski test. For this, extract was mixed with equal amount of chloroform and conc. sulphuric acid. Chloroform layer appear red while acid layer showed greenish yellow fluorescence.

(vi) **Detection of saponins:** Small amount of extracts were shaken with water to check foam formation and its time of stability.

(vii) **Detection of flavonoids:** Extract was subjected to Shinoda test. Treatment of extract with conc. sulphuric acid gives yellow orange colour and ferric chloride test, colour changes from green to black.

(viii) **Detection of phenolic compounds:** Small amount of extract was mixed with few drops of freshly prepared 5% $FeCl_3$ solution; deep blue-black color indicated the presence of phenolic compounds. Small amount of extracts mixed with lead acetate solution, formation of white ppt. indicated the presence of phenolic compounds.

(ix) **Detection of proteins:** Small amount of extract was treated with Biuret reagent for the protein detection.

(x) **Detection of tannins:** Five mL of the tepal extract was placed in a test tube and then 2 mL of 5% of $FeCl_3$ solution was added. A greenish-black precipitate indicates the presence of tannins.

(xi)

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2.5 Quantitative analysis

Quantitative analysis is an important tool for the determination of quantity of phytoconstituents present in plant extracts. For this TPC and TFC are determined. Extracts obtained from Flowers of Jasminum mesnyi plant material of subjected to estimate the presence of TPC and TFC by standard procedure.

(i) Determination of Total phenolic content (TPC)

The total phenolics content of the extract was estimated according to the method described by Singleton and Rossi.[33]. The concentration of methanolic and butanol extracts solution was 10 mg/10 mL. From this solution, 1mLwas taken in test tubes and by dilution with same solvent up to 10 mL. This is stock solution. From stock solution different concentrations were taken in different test tubes. This same procedure was used for standard. Gallic acid was used as a standard; 1 mL of Folin–Ciocalteu reagent was added in this concentration and the content of the flask was mixed thoroughly and 5 min later 4 mL of 20% sodium carbonate was added, and the mixture was allowed to stand for 30 min with intermittent shaking. The absorbance of the blue color that developed was read at 765 nm in UV spectrophotometer.

(ii) Determination of Total Flavonoid Content (TFC)

The total flavonoid content was determined using the method described by Olufunmiso [34]. 1 ml of 2% $AlCl_3$ methanolic solution was added to 1 Ml of extract or standard and allowed to stand for 60 min at room temperature; The absorbance of the reaction mxture was measured at 420 nm using UV/Visible Spectrophotometer. The content of Flavonoids was calculated using standard graph of Quercetin and the results were expressed as Quercetin equivalent (mg/g).

2.6Antioxidant activity

DPPH radical scavenging activity

The DPPH radical scavenging activity assay was determined according to the method given by Brand- Williams [35], with some modifications. The stock solution was prepared by using 100 ml of methanol along with 24 mg of DPPH and was stored at 20^0C until needed. The working solution was prepared by diluting DPPH solution with methanol to obtain an absorbance of about 0.980 (±0.02) at 517 nm using bio-spectrophotometer. The varying concentrations (100– 500 µg/ml) of 100 µl fractions were prepared by mixing 3 ml aliquot of this solution. Then it was shaken well and incubated in dark for 15 min at room temperature. After 15 minutes the absorbance was measured at 517 nm by using bio-spectrophotometer. Ascorbic acid standards were used as positive controls [36-38]. The percentage of DPPH radical scavenging activity was calculated based on the following formula.

DPPH radical scavenging % = $[(A_0 – A_1)/A_0] \times 100$

Where A_0 is the absorbance of the DPPH solution and A_1 is the absorbance of the sample.

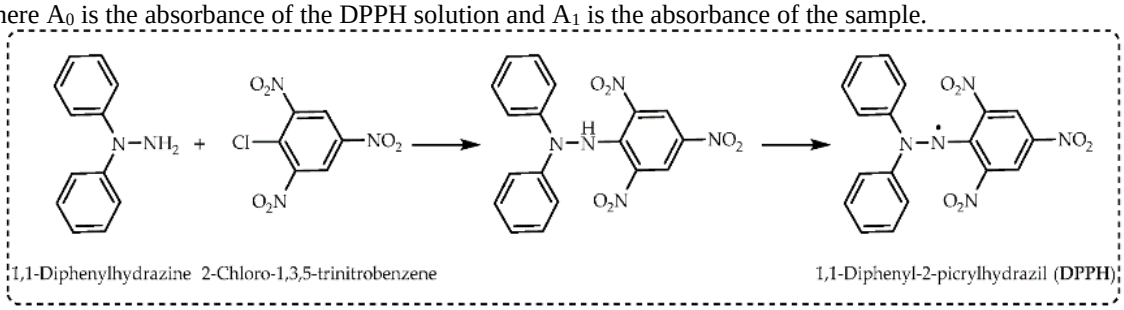

Fig 1: The synthesis route of 1,1-diphenyl-2-picrylhydrazil radicals (DPPH·).

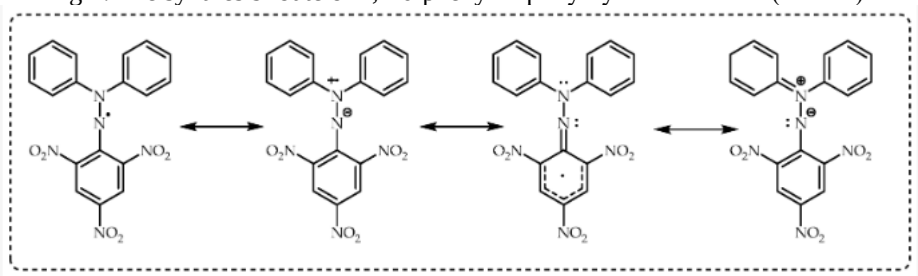

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Fig 2. The chemical structures of a 1,1-diphenyl-2-picrylhydrazil radical (DPPH·).

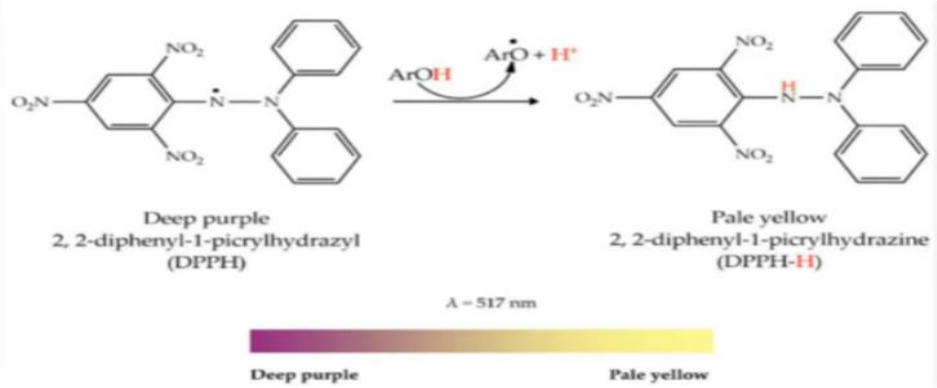

Fig 3. The Mechanism of a 1,1-diphenyl-2-picrylhydrazil radical (DPPH·).

The antioxidant capacity of test samples was expressed as EC_{50} the concentration necessary for 50% reduction of DPPH. IC_{50} values denote the concentration of sample required to scavenge 50% of DPPH free radicals. IC_{50} value was determined from the plotted graph of scavenging activity against the different concentrations, which is defined as the total antioxidant necessary to decrease the initial DPPH radical concentration by 50%. The measurements were triplicates and their scavenging effect was calculated based on the percentage of DPPH scavenged [39-42].

III. RESULT AND DISCUSSION

(i) Physiochemical parameters

Physiochemical parameters of the flower of Jasminum mesnyi are tabulated in Table 3.1. Different extracts of the powdered flower were prepared for the study of extractive values. Percentage of extractive values was calculated with reference to the air-dried drug. The results are shown in Table 3.1. Deterioration time of the plant material depends upon the amount of water present in plant material. If the water content is high, the plant material can be easily deteriorated due to fungus. The loss on drying at 105 °C in flower was found to be 10.1%. Total ash value of plant material indicated the amount of minerals and earthy materials attached to the plant material. Physiochemical parameters of the flower of Jasminum mesnyi are tabulated in Table 3.1. Studies of physicochemical characterization can serve as a valuable source of information and are usually applied in judging the purity and quality of the drug. The extractive values give an idea about the chemical constitution of the drug.

Table 3.1**:** Physicochemical parameters of flower Jasminum mesnyi

S.N	Parameters	Results (%w/w)
1	Total Ash	5.57
2	Acid insoluble Ash	1.67
3	Water -soluble Ash	2.59
4	Water soluble extractive value	19.50
5	Methanol soluble extractive value	20.80
6	Loss on Drying	6.39

Jasminum mesnyi flower ethanol extract has the highest solubility of phytochemicals when extracted with methanol than aqueous extracts tested. Analytical results showed the results are in

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agreement with Jasminum mesnyi flower extracts total ash 5.57, acid insoluble 1.67, water-soluble ash 2.59, water- soluble extractive value 19.50, methanol soluble extractive value 20.80, and loss of drying (moisture of contents) 6.39.

(ii) Estimation of total phenolics and total flavonoids content

The results given in table 3.2 show that the total phenol content and total flavonoid of Jasminum mesnyi flowers are methanolic 465.94± 0.17, 445.24 ± 0.16and aqueous extract 335.20± 0.35, 323.72± 0.23 respectively. The above results showed that aqueous extract contain less phenolic and flavonoids content than the alcoholic extract. It may due to the solubility of principle contents presence be higher in case of alcoholic solvent, thus it has been accepted that it is a universal solvent for the extraction of plant constituents

Table 3. 2**:** Estimation of total phenolics and total flavonoids content in Jasminum mesnyi flower

S.N.	Extract	Test Parameter	Results(mg/g) (±SEM)
1.	Methanol	Total phenolic Total Flavonoids	465.94± 0.17 445.24± 0.16
2.	Aqueous	Total phenolic Total Flavonoids	335.20± 0.35 323.72± 0.23

(iii) Fluorescence characteristics

Fluorescence characteristics of different solvent extracts under visible, short, and long light were determined and are shown in Table 3.3. Fluorescence behavior of the flower powder with different chemical reagents was analyzed to detect the occurrence of phytoconstituents along with color changes.

Table 3.3: Fluorescence behavior of powdered flower treated with different reagents

S.N.	Testing	Short UV (254nm)	Long UV (365nm)	Visible light
1.	Powder as such	Green	Green	Green
2.	Powder + Saturated Picric acid	Neo Green	Neo Green	Neo Green
3.	Powder + Nitric acid (HNO_3)	Neo Green	Dark Blue	Yellow
4.	Powder +HCl	Dark Blue	Transparent	Dark Blue
5.	Powder+50% H_2SO_4 acid	Transparent	Blue	Transparent
6.	Powder glacial acetic acid	Red	Black	Brown
7.	Powder + 5% ferric chloride	Dark Blue	Neo Green	Dark Blue
8.	Powder + 2N Sodium hydroxide solution	Yellow	Neo Green	Neo Green
9.	Powder +Aqueous iodine solution	Neo Red	Neo Green	Neo Yellow

(iv) Phytochemical Screening

The study of the chemical constituents and the active principles of the medicinal plants have acquired a lot of importance all over the world [43]. The present study includes the phytochemical screening of the plants Jasminum mesnyi. The qualitative chemical tests for the methanolic extracts were performed. The investigation showed that Jasminum mesnyi contains flavonoids, saponins, tannins, Steroidal glycosides, Triterpenoids, Reducing Sugar, Phenolic compound, steroids, Amino acid and Protein present in methanol and aqueous extract but tannins Anthraquinones Glycoside, alkaloids were absent in aqueous extract.

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Table 4.4: Phytochemical Screening of Jasminum mesnyi flower Methanolic and Aqueous extract

S.N	Phytochemicals	Methanolic Extract	Aqueous Extract
1	Flavonoid	+	+
2	Saponins	+	+
3	Tannins	+	-
4	Steroidal Glycoside	+	+
5	Triterpenoids	+	+
6	Anthraquinones Glycoside	-	-
7	Reducing Sugar	+	+
8	Alkaloid	+	-
9	Steroids	+	+
10	Phenolic compound	+	+
11	Amino acid and Protein	+	+

(+): Presence, (-): Absent

In-vitro antioxidant studies on polyherbal methanol and aqueous extract shows high amount of polyphenol and flavonoids as presented in Table 3.2. Flavonoids and phenolic in small quantities are free radical scavengers, which prevent oxidative cell damage. They have been known to produce anti-allergic, anti-inflammatory, antimicrobial, and anticancer activities. other phytoconstituents identified in the study are saponins tannins, alkaloids, Flavonoids, glycosides, Reducing Sugar, Terpenoid Phenolic compound, Steroid, and Amino acid and Protein.

(v) DPPH radical scavenging activity

DPPH is a stable free radical and accepts an electron or hydrogen radical to become a stable diamagnetic molecule. In the DPPH assay, the antioxidants are able to reduce the stable radical DPPH to non-radical form, DPPH-H. The purple-colored alcoholic solution of DPPH radical changes to yellow in the presence of hydrogen donating antioxidant which could be measured at 517nm, the activity is expressed as effective concentration IC_{50}, which is the concentration of the sample leading to 50% reduction of the initial DPPH concentration [44-45].

We completed the antioxidant activity according to standard protocols using the DPPH free radical scavenging procedure. Experimental data revealed that higher concentrations possess higher absorbance, while lower concentrations exhibit lower absorbance. The table and figure clearly indicate its concentration and absorbance. IC_{50} for standard ascorbic acid was found to be 0.092 µg/ml and for methanol and aqueous extract flower was found to be 0.317µg/ml and 0.485 µg/ml respectively. We observed lower concentrations (0.098 g/mL and 0.156 g/mL) for both extract methanol and water of Jashminum mesnyi at 20 mL, and higher concentrations (0.485 g/mL and 0.906 g/mL) at 100 mL of extract. We applied a UV-Vis spectrophotometer to record the solution absorbance at 517 nm and weights were expressed as g/mL. We used ascorbic acid as the standard solution and concentrated methanol as the blank solution.

Table 4.5: Scavenging effect of methanol and water extracts of Jashminum mesnyi and ascorbic acid on DPPH radicals.

S. N.	**Concentrations (mL)**	**Ascorbic acid (g/mL)**	**Methanol Extract (g/mL)**	**Water Extract (g/mL)**
1	20	0.032	0.098	0.156
2	40	0.094	0.203	0.323
3	60	0.162	0.313	0.499
4	80	0.239	0.448	0.694
5	100	0.313	0.485	0.906
6.	IC_{50}	0.092	0.317	0.485

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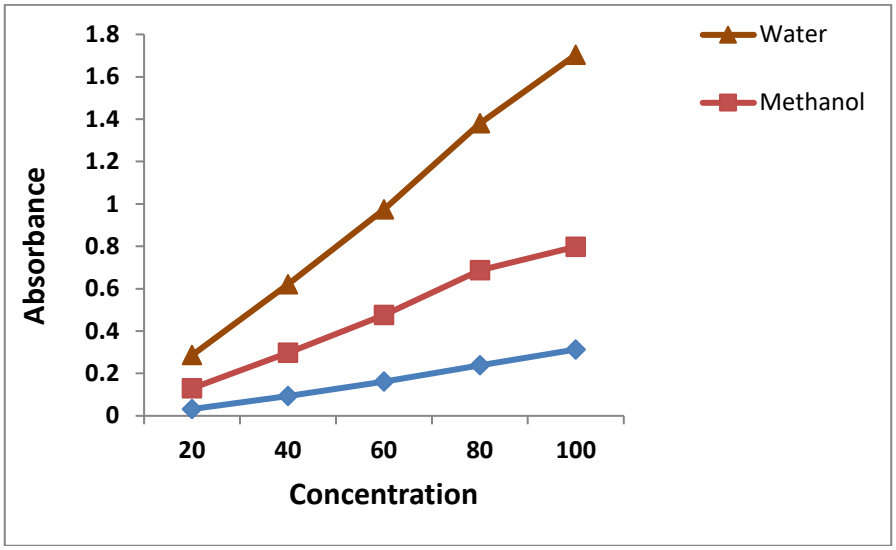

Fig: DPPH radical scavenging activity of ascorbic acid (positive control) methanol and water extracts of Jashminum mesnyi flowers.

The medicinal plants, which contain high quantities of polyphenols, are considered to be good source of natural antioxidant compounds and more often possess higher antioxidant potential than that of dietary fruits and vegetables. Consumption of these plant products certainly prevents the free radical mediated damage in the cell and therefore protects the body from several health problems. These antioxidant compounds can be used as natural antioxidant additives or nutritional supplements in the food products. As of natural origin, these antioxidants are much safe to use. Thus, much attention has been focused on the investigation of natural antioxidant compounds from plants, which can effectively scavenge ROS.

IV. CONCLUSION

Herbal medicines are the boon of godas they have immense potential to treat the diseases with least side effect and with high safety and efficacy. Scrupulous screening of literature disclosed that J. mesnyi is one of most trendy remedy for curing variety of ailments among the various pharmacological activities. The plant has been screened for its phytoconstituents, antioxidant activity but many other biological studies are yet to be explored. Therefore, scrupulous work is required, because the literature shows limited research in several areas to understand and reveal the mode of its pharmacological activities. In addition, isolation, purification and identification of new entities from J. mesnyi are required as it may help further to establish the application of isolated compound in treatment of various acute and chronic diseases and provide more assurance in application of isolated compounds.

The phenolics constituents reported from jasminum mesnyi were responsible for majority of the therapeutic potentials except the antimicrobial, anti-acne, spasmolytic activity and aromatherapy, which is attributed to essential oil components. The essential oils mainly contribute to fragrance and it is widely used in cosmetics and perfumery industry. Hence, therefore study in this area may reveal the potential thrust of Jasminum mesnyi to be used in the pharmaceutical industry.

CONFLICTS OF INTEREST: The authors declare no conflict of interest.

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