International Journal of Advances in Engineering and Management (IJAEM)
Volume 3, Issue 7 July 2021, pp: 3344-3347 www.ijaem.net ISSN: 2395-5252

Phytochemical Analysis of Few Plants from Trimbakeshwar and Surgana Forest, Nashik District, Maharashtra, India.

* Smita Deepak Shinde
P.G Department of Botany, JET'S Zulaljirao Patil College, Dhule - 424002(Maharashtra)India.

Submitted: 15-07-2021 Revised: 29-07-2021 Accepted: 31-07-2021

ABSTRACT
Phytochemicals are bioactive compounds obtained from the plants and widely applied in the traditional herbal medicines.These phytochemicals are the secondary metabolites present in smaller quantities in higher plants and they include the alkaloids, steroids, flavonoids, terpenoids, tannins and many others. In medicinal plants for evaluation of antioxidant phytochemicals such as phenols, flavonoids and tannins have received more attention for their potential role in prevention of human diseases.The Present study was aimed to evaluate the phytochemical constituents of eleven rare plants from Surgana forest of Nashik division.The phytochemical screening were carried out of the Plant-part.The plants were LygodiumflexosumL.f., Buteamonosperma (Lam.)Taub.,Pancratiumsanctae-mariae Blatt.&Hallb., SemecarpusanacardiumL.f, Geodorumdensiflorum (Lam.)Schlecht., Dolichandronefalcata (Wall. ex DC.)Seem, Nerviliaplicata (Andr.)Sclecht, Diplocyclospalmatus (L.)C.Jeffrey, GrewiasalvifoliaHeyne ex Roth,CoixgiganteaKoen.ex.Roth, Plumbagozeylanica L.

Keywords:Phytochemical,Quantitative,LygodiumflexosumL.f.,Buteamonosperma(Lam.)Taub.,PancratiumsanctaemariaeBlatt.&Hallb., SemecarpusanacardiumL.f, Geodorumdensiflorum(Lam.)Schlecht., Dolichandronefalcata(Wall. ex DC.)Seem, Nerviliaplicata(Andr.)Sclecht, Diplocyclospalmatus(L.)C.Jeffrey, GrewiasalvifoliaHeyne ex Roth, CoixgiganteaKoen.ex.Roth, PlumbagozeylanicaL.

I. INTRODUCTION:

Plants are very important to humans' life as food, shelter and even as medicines.Traditional knowledge of medicinal plants is now considered to play a vital role in addressing the health care needs of developing countries and indigenous people. Khairnar, S. S. &Gadekar, V. S. (2019).

The natural vegetation of Nashik District includes a variety of plant species having economic importance. It yields timber, food and fodder plants and plants having medicinal value.

Here the tribal's are largely dependent on forest products for their livelihood. Sharma, B.D. &Lakshminarshimhan (1986). They are knowledgeable about the utility of the majority of these plants. The maximum precipitation recorded at Surgana and Trimbakeshwaris 2500mm (1958-59) and 2307 mm (1958-59) respectively.Gazetter of India (2019)

Phytochemicals are bioactive compounds found in plants that work with nutrients and dietary fiber to protect against diseases. They are non-nutritive compounds. These phytochemicals are the secondary metabolites present in smaller quantities in higher plants and they include the alkaloids, Steroids, Flavonoids, Tannin,Carbohydrate, Proteins, Glycosides and Gums, and many others.

The present investigation is carried out to study the constituents of the plants by phytochemical analysis of the following plants which are rare and endangered-Lygodiumflexosum L.f., Buteamonosperma (Lam.)Taub., Pancratiumsanctae-mariae Blatt.&Hallb., SemecarpusanacardiumL.f, Geodorumdensiflorum (Lam.)Schlecht., Dolichandronefalcata (Wall. ex DC.)Seem, Nerviliaplicata (Andr.)Sclecht, Diplocyclospalmatus (L.)C.Jeffrey, Grewiasalvifolia Heyne ex Roth, Coixgigantea Koen.ex.Roth, Plumbagozeylanica L.

GEOLOGY AND SOIL:

Forest is enriched with medicinal plants .As it was an onset of rainfall forest department took the efforts of tree plantation and maintained the forest by planting trees like Sissovetc, and in the nursery many plants seedlings are developed

International Journal of Advances in Engineering and Management (IJAEM)
Volume 3, Issue 7 July 2021, pp: 3344-3347 www.ijaem.net ISSN: 2395-5252

Ficus, Fig, Khair). Mixed deciduous forests, occurring in both protected as well as reserved forest. Generally found in black and Grey soil. Here is the floristic data with medicinal plants.Geological Survey of India (1976).

Trees like- Acaciachundra, Albizialebbek, Dalbergialanceolaria, Terminaliabellerica, T. chebula, T.crenulata, Cassiafistula, Pongamiapinnata, Wrightiatinctora, Emblicaofficinalis, Ficusracemosa, Madhucaindica, Syzygiumcumini.

Shrubs were, Carissacongesta,Carviacallosa, Caseariagravelens,Lantanacamara, Meynalaxiflora,Woodfordiafruticos,Zyziphusglaberrima.

Climbers were- Cuscutareflexa, Acaciapennata, Dioscoreabulbifera,.Some were parasitic like Cuscutareflexa, There were Epiphytic orchids- Aeridescrispum , Eriadalzellii, Nervileasps.

Ferns like- Adiantumphilippense, Cheilanthusfarinose By Flora of Nasik Sharma,B.D and Lakshminarasimhan,P. (1991).Lakshminarasimhan P. L., Singh N.P. (2000). Many plants and their parts are used as medicines.

Material method:

Field work:

The plants were collected from their natural habitat.The field work is based on collections and photographs from systematic planning and meticulously exploring the area for gathering various information related to the medicinal uses of plants, distribution, data related with database for computer analysis. All the information collected during outings has been recorded in the field book.The mode of preparation of medicines from plants and dosages given to the patients has been recorded from the medicineman, vaidya or tribal bhagats. The methods of preparation of infusions, decoctions, juice and extracts, pastes, pills, powder, oil,etc. has also be recorded. Collected plants are verified by using Flora of Nasik Sharma B.D and Lakshminarasimhan,P (1991), Bentham G. & J.D. Hooker (1862-1883).Phytochemical analysis was carried out by using the standard method. Collected plants were verified by using, Lakshminarasimhan& Sharma (1991), Cooke, (1958).

Laboratory Work:

All the collected plants were processed for herbarium by dry method as per the routine herbarium techniques suggested by Santapau (1955). Specimens were critically examined in the laboratory with the help of floras, mainly Lakshminarsimhan and Sharma (1991), Cooke, (1901-1908), Manuals, Monographs and other available literature for provisional identification.

The collected samples were shade dried and crushed to a coarse powder by grinder.Then the samples were labelled as, A1,A2,A3,A4,A5,A6,A7,A8,A9,A10, and A11, phytochemical analysis was carried out.Phytochemical screening and antioxidant activity of extracts of the leaf and bark of Albizialebbeck(Benth)-Vasanthiet al.(2014).

CHEMICALS: The entire chemicals used in the present study are of analytical grade.

PHYTOCHEMICAL ANALYSIS: Experimental phytopharmacognosy –Dr S.S Khadbadiet al.(2009).

S. N	Chemical constituents of plants	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11
1	Carbohydrates (Molisch Test)	+	+	+	+	+	+	+	+	+	+	+
2	Proteins (Biuret Test)	-	-	-	+	+	-	+	+	-	+	-
3	Tannins and Phenolic compounds (Ferric chloride Test)	+	-	-	+	+	-	-	-	-	-	+
4	Mucilage (Ruthenium Red Test)	-	+	-	-	-	-	-	+	-	-	-
5	Flavonoids (Shinoda Test)	-	-	-	-	-	-	+	-	-	-	-
6	Gums	-	+	+	-	+	+	+	-	+	+	+

International Journal of Advances in Engineering and Management (IJAEM)
Volume 3, Issue 7 July 2021, pp: 3344-3347 www.ijaem.net ISSN: 2395-5252

	(Dil. HCl and Fehling's Test)											
7	Steroids (Salowski)	-	-	-	+	-	+	+	-	+	-	+
8	Alkaloids (Dragendorff's Test)	+	+	+	-	+	-	+	+	-	+	+

A1: Lygodiumflexosum, A2:Buteamonosperma, A3: Pancratiumsanctae-mariae Blatt. Et. Hallb.A4: Semecarpusanacardium, A5:Geodorumdensiflorum, A6: Dolichandronefalcata, A7: Nerviliaplicata, A8: Diplocycluspalmatus, A9: Grewiasalvifolia, A10: Coixgigantea, A11: Plumbagozeylanica.

QUALITATIVE ANALYSIS OF ELEVEN RARE PLANTS- Experimental phytopharmacognosy –Dr S.S Khadbadiet al.(2009)

TESTS FOR CARBOHYDRATES: [3, 7-10]

a) **Molisch's test**: To 2 mL of test solution adds few drops of α-naphthol solution in alcohol and adds 2 mL of concentrated H2SO4 slowly from the sides of the test tube. A purple ring is observed at the junction of two liquids.

b) **Fehling's test**: Mix 1 mL Fehling's solution A and Fehling's solution B, boil for 1 minute, add equal volume of test solution, heat in boiling water bath for 10 minutes. First yellow, then brick red precipitate is observed.

2. TEST FOR GUMS: Hydrolyse test solution using dilute HCl. Perform Fehling's or Benedict's test. Red color is developed.

3. TEST FOR MUCILAGE: a) Powdered drug material shows red color with Ruthenium red. b) Powdered drug swells in water or aqueous KOH.

4. TESTS FOR PROTEINS:

a) **Biuret test (General Test):** Test solution treated with 4% sodium hydroxide and dilute copper sulphate (1%) solution gives violet or pink color.

b) **Millon's test**: Mix 3ml of test solution with 5 mL Million's reagent. White precipitate is obtained which turns into brick red or red colored solution on warming. Millon'sreagent- Dissolve 3 mL of mercury in 27 mL of fuming nitric acid, keep the mixture to cool. Dilute the solution with an equal quantity of distilled water.

5**. TESTS FOR AMINO ACIDS**

a) **Ninhydrin test (General test):** Heat 3 mL test solution and 3 drops 5% Ninhydrin solution in boiling water bath for 10 minutes. Purple or bluish color appears.

6. TEST FOR FATS AND OILS

a) **Solubility Test**: Oils are soluble in ether, benzene and chloroform, but insoluble in 90% ethanol and in water. (Exception is castor oil, soluble in alcohol).

b) **Saponification Test**: Evaporate extract to get 10 mL oil. To oil add 25 mL 10% NaOH. Boil in water bath for 30 minutes. Cool. Add excess Na2SO4 solution. Soap forms and rise to the top. Filter, to filtrate add H_2SO4.Evaporate, collect residue, dissolve in ethanol. With ethanolic solution, perform following tests:

1) To ethanolic solution, add few crystals of $KHSO_4$.Heat vigorously. Pungent odour of acrylic aldehyde is produced.

2) To ethanolic solution, add few drops of CuSO4 and NaOH solution. Clear blue solution is formed.

7. Test For Sterols And Triterpenoids:

a) **Salkowaski test**: When a few drops of concentrated H_2SO_4 is added to the mixture of chloroform and test solution, shaken and allowed to stand, lower layer turns red indicating the presence of sterols and formation of yellow colour in the lower layer indicates the presence of Triterpenoids.

12. TESTS FOR ALKALOIDS:

a**) Mayer's test**: Test solution with Mayer's reagent (potassium mercuric iodide) gives cream-colored precipitate.

b) **Wagner's test**: The acidic solution with Wagner's reagent (iodine in potassium iodide) gives brown precipitate.

c) **Hager's test**: The acidic solution with Hager's reagent (saturated picric acid solution) gives yellow precipitate.

d) **Dragendorff's test**: The acidic solution with Dragendorff's reagent (potassium bismuth iodide) shows orange brown precipitate.

13. TESTS FOR SAPONINS:

a) **Foam test**: Saponins when mixed with water and shaken, shows the formation of foam which is stable at least for 15 minutes.

b) **Haemolysis test**: 2 mL of 18% sodium chloride solution in two test tubes is taken. To one test tube added distilled water and to the other 2 ml of filtrate. Few drops of blood are added to both the test tubes. Mixed, observed for haemolysis under microscope.

14.TESTS FOR FLAVONOIDS:

a) **Shinoda test**: Test solution with few fragments of magnesium ribbon and concentrated hydrochloric acid, shows pink to magenta red colour.

15. TEST FOR TANNINS AND PHENOLIC COMPOUNDS

a) **Ferric-chloride test**: Test solution treated with few drops of ferric chloride solution gives dark color.

b) **Lead Acetate Test**: Add 10% w/v solution of lead acetate in distilled water to the test filtrate. Precipitate indicates presence of tannins.

II. RESULT:

The qualitative phytochemical test exhibited the presence of common phyto-compounds including Carbohydrates, proteins, Alkaloids, Steroids,Tannin,Mucilage.(+ represent presence and ++ represent high concentration). Proteins,Tannins,Mucilage were also found in the plant extract.

The result of phytochemical screening revealed the presence of chemical components in the stem-bark of eleven rare plants found in Surgana and Trimbakeshwarforest region.The stem bark, roots, leaves of the plants investigated for phytochemical constituents seems to have the potential to act as a source of medicines and also to enhance the health status of the consumers due to the presence of various compounds they play a vital role for good health. Flavonoids, Mucilage and Tannin found least in number as compare to other chemical components.

III. ACKNOWLEDGEMENT:

The authors express their thanks to the Principal and Head of the Department of Pharmacy College, MET, Nashik for their guidance and for providing the facility to work in the lab.

RESEARCH REFERENCES:

[1]. **Bentham G. & J.D. Hooker (1862-1883).**Genera Plantarum, London.

[2]. **Cooke T. (1901-1908)**.The Flora of the Presidency of Bombay, London 2 Vols. (Reprinted editon, 1958, 3 Vols. Government of India).

[3]. **Cooke Th. (1958)**. (Repr.ed) The Flora of the Presidency of Bombay, Botanical Survey of India, Calcutta.Vol I-III.

[4]. **Gazetter of India (2019):** Maharashtra state,Nashik district(Revised edition),Government of Maharashtra.

[5]. **Geological Survey of India (1976).** Geology of the Nasik district, Maharashtra.Vol 3,No. 2.

[6]. **Jeet Singh, ChandrakantKhade, (2012-13 to2021-22)** Working plan for East Nashik Division.

[7]. **Khadbadi, S.S. , B.A. Baviskar and Dr.S.I. Deore(2009).** Pharmacognosy and Phytochemistry.NiraliPrakashan.

[8]. **Khairnar, S. S. &Gadekar, V. S. (2019)**.Studies on Ethnobotanical plants used by tribal community of Nasik district, Maharashtra, India.Journal of Medicinal Plant Studies 7(**4**):201-204.

[9]. **Lakshminarashinhan P. & Sharma, B.D.(1991).**Flora of Nashik District, BSI, **ft**. India.**Ser**; Calcutta.

[10]. **Lakshminarasimhan P. L., Singh N.P. (2000).** Introductory chapters for the flora of Maharashtra state, In Singh N.P. &Karthikeyan S.(Eds.) Flora of Maharashtra state, Dicotyledones;Vol.I., Flora of India series 2, Botanical Survey of India, Pune.

[11]. ofCarica papaya .Pakistan Journal of Nutrition, 4**(6):**379-381.

[12]. **PadmanabhanVasanthi, ManimekalaiGanapathy, Vasthi Kennedy Evanjelene,NirmalaAyyavuv&JagajothiAngamuthu (2014).**Phytochemical screening and antioxidant activity of extracts of the leaf and bark of Albizzialebbeck(Benth). Academia Journal of Medicinal Plants Vol**.** 2(**2**):026-031.

[13]. **Sanatapau H.(1955).** Botanical Collectors Manual.GovernmentPress;New Delhi:27

[14]. **Sharma, B.D. &Lakshminarshimhan (1986)**. Ethnobotanical studies on the tribals of Nashik District (Maharashtra). J E comd. Tax.Bot**8(2)**:439-454