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Evaluation of physiochemical screening and standardization of *Tamarix ericoides* Rotte (root): A medicinally important plant from akola region

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Abstract
Medicinal plants contain some organic compounds which provide definite physiological action on the human body. The present study was aimed at physico-chemical and preliminary phytochemical screening of *Tamarix ericoides* of root extracts. The dried root powder was subjected to successive Soxhlet extraction using Petroleum ether, methanol and water. These solvent extracts were subjected to a preliminary phytochemical screening to detect the different chemical principles present viz., carbohydrates, proteins, amino acids, steroids, glycosides, alkaloids, Flavonoids, tannins and phenolic compounds, the phytochemical evaluation revealed the presence of glycosides, saponins**,** sterols, phenolic compounds, flavanoids, tannins, carbohydrates. The diversity of phytochemicals found suggests that that aqueous, petroleum ether, acetone and methanolic solvent extracts of these tested plants contain medicinally important bioactive compounds Hence Standardization of crude drug plays a very important role in identifying the purity and quality of crude drugs. The present investigation reveals Standardization which include Total ash, Acid insoluble ash, Water soluble ash, Water soluble Extractive value, Alcohol soluble Extractive value, Phytochemical screening, and further isolation and identification of Phytoconstituents.

Keywords: Tamarix ericoides, phytoconstituent, physiochemical parameter, medicinal use etc

Introduction
The world Health organization (WHO) estimates that 80% of the world's Population presently uses herbal medicine for same aspect of primary health cure. It is very important that a system of standardization must be established for every plant medicine in the market because the scope for variation in different batches of medicine is enormous. Due to this resion we selected the medicinally valuable plant *Tamarix ericoides Rottl*. is tall shrub belonging to family Tamaricaceae The plants generally used by local peoples and tribal of Maharashtra as erthnomedicine on various ailments. The roots generally used diabetes, febrifuge, antidermatosis. It is also used on paralysis, upper limb; sensation of motion during egging. It is also dye yielding plants. Due to such medicinal properties it necessary to investigate their medicinal properties. However, perusal of literature reveals that pharmacochemical information on *Tamarix ericoides Rottl*. Is totally lacking, hence in the present investigation was undertaken. The objective of the present study is to evaluate pharmaco-chemical characteristics like ash values, extractive values, and phytochemical analysis of *Tamarix ericoides Rottl.*

Morphological characteristics of *Tamarix ericoides* Rottl
Tamarix ericoides Rottl is Shrubs or undershrub, about 1-3 m tall. Stem much branched, blackish brown, glabrous or subglabrous, two kinds of branches present, young green vegetative branches which are deciduous in winter and ligneous old growing branches which are not deciduous in winter. Leaves alternate, scale-like, vaginate, free part triangular-ovate to lanceolate-ovate, 1.5-5.5 x 0.3-0.4 cm across, base amplexicaul, apex acuminate, keeled, rachis papillose, glabrous, long salt secreting glands present, petiole sessile, stipules absent. Inflorescence racemes in young and old branches, terminal or lateral. Flowers bisexual, slightly fragrant, pedicel very short or subsessile, bracts amplexicaul or semi amplexicaul, triangular, margins irregular denticulate or subentire, apex acuminate, about 2.5-6 mm long, sepals 5 partite lobes or almost free, obovate-suborbicular, margins obscurely denticulate, apex obtuse, about 2.5-3.5 x 1.5-2 mm across, petals 5, oblong-elliptic to obovate, pink or pale pink, margins entire, about 5-7 x 4-4.5 mm across. Stamens 5, in series or two, inserted near nectiferous disc, exserted, opposite to calyx filaments, about 3-6 mm long, anthers bi-lobed, disc cup shaped, about 1.5-2 mm across. Ovary conical or pyramidal, 3-4 locular, ovules many, basal parietal placentation, styles 3, free, rarely connate at the base, stigma 3, capitate. Fruit capsule, conic-pyramidal, about 3-4 x 1.3-2 mm across, tri-valved. Seeds numerous, about 1-1.5 mm across coma about 5-8 mm long.

Material and Method
Plant Material and Preparation of Extract
The plant material collected from wild stage from near forest that is Chikhldara of Amravati district (M.S). Plant was identified by taxonomically by local taxonomist and with help of flora of Marathwada [Naik, 1998] [16], flora of Maharashtra [Singh & Kartikeyan, 2000] and flora of Akola district [Kamble & Pradhan, 1988] [14]. The plant material Root of the plant was cleaned and shade dried. The dried plants were pulverized by an electrical blender and passed through the 20 µ mesh sieve. A powdered plant was extracted successfully with ethanol, water and acetone by using soxhlet apparatus and water extracted by cooled maceration. The extraction was carried out for 24 hrs. at

room temperature. The extract was filtered and concentrated at 45 °C using rotary vacuum evaporator. after drying the extract, it used for further investigation.

Physiochemical Analysis (Parameter)

Ash Values

The total ash, acid insoluble ash and water-soluble ash values were determined for air-dried samples using the procedure described.

Procedure:

Total Ash Value

About 2gm of powdered drug was weighed accurately into a tarred silica crucible and incinerated at 450 °C in muffle furnace until free from carbon. The crucible was cooled and weighed. Percentage of total ash was calculated with reference to air-dried substance

Acid Insoluble Ash

Ash obtained from total ash was boiled with 25ml of 2N HCl for few minutes and filtered through an ash less filter paper. The filter paper was transferred into a tarred silica crucible and incinerated at 450 °C in muffle furnace until free from carbon. The crucible was cooled and weighed. Percentage of acid insoluble ash was calculated with ference to air-dried substance.

Water Soluble Ash

Ash obtained from total ash was boiled with 25 ml of distilled water for few minutes and filtered through an ash less filter paper. The filter paper was transferred into a tarred silica crucible and incinerated at 450 °C in muffle furnace until free from carbon. The crucible was cooled and weighed. Percentage of water-soluble ash was calculated with ference to air-dried substance.

Extractive Values

This parameter determines the amount of active constituent present in the plant.

Procedure

Alcohol Soluble Extractive Value

5 gm of powdered drug was macerated with 100 ml of alcohol in a stoppered flask with frequent shaking during first 6 hrs. and allowed to stand for 18 hrs. It was filtered after 24 hrs. 25 ml of the filtrate was evaporated in a tared dish at 105 °C and weighed. Alcohol soluble extractive values were calculated.

Water Soluble Extractive Value

5 gm of powdered drug was treated with 100 ml of water at 80 °C in a stoppered flask with frequent shaking for 6 hrs and allowed to stand for 18 hrs. It was filtered after 24 hrs. 25ml of the filtrate was evaporated in a tired dish at 105 °C and weighed. Water-soluble extractive values were calculated.

Phytochemical Analysis

Chemical tests were carried out for different extract to detect the presence of bioactive components in them by using standard methods (Harborne JB, 1973).

Test for Alkaloid

3 ml each extract was stirred with 3 ml of 1% HCl on steam bath. After that the extracts were cooled to room temperature and Mayer and Wagner's reagent was added to mixture. Turbidity of the resulting precipitate was taken as an evidence for the presence of alkaloid

Test for Tannins

About 2 ml of the aqueous extract was stirred with 2 ml of distilled water and few drops of 1% FeCl3 Solution were added. Formation of blue, green or brownish green colour indicated the presence of tannins

Test for Quinine

To the 2 ml of extract conc. H2SO4 was added and shake well for 5 min show the red color.

Test for Cardiac Glycosides (Keller-Killiani Test)

To the 5 ml of extract 1 ml of conc. H2SO4 2 ml of glacial acetic acid and 1 ml of drop of FeCL3 solution was added. Appearance of brown ring shows the presence of cardiac glycoside.

Test for Flavonoids

To the small quantity of extract lead acetate solution was added. Formation of yellow precipitate showed the presence of Flavonoids.

Test for Saponins

To the 1ml extract 20ml distilled water was added and shakes well in measuring cylinder for 15 min. then 1cm layer of foam was formed.

Test for Coumarine

To the 2 ml of extract 10% NaOH was added and shake well for 5 min show the yellow color.

Quantitative analysis of *Tamarix ericoides* root plant parts

Preparation of plant extracts for quantitative determination of alkaloids 5 gm of powdered plant material was taken into 20 ml of Acetone and vigorously stirred. The content was transferred into a reagent bottle. The slurry was kept overnight at room temperature. Then it was centrifuged at 6000 rpm for 10 min and the supernatant was made up to 50 ml with acestone.

Estimation of total alkaloids by titrimetric methods used by Plummer. 2013 and Debnath *et al.* 2015.

Obtained supernatant of the plant sample was used for the estimation of total alkaloids by titrimetric methods. 10 ml of the supernatant was taken into a100 ml separating funnel. 10 ml of 0.1 (N) HCl was added and shaken thoroughly for 2-3 min. This results in the solubility of alkaloids. The lower layer contains alkaloids neutralized with 0.1 (N) HCl and the upper layer contains n-butanol. 10 ml HCL portion was collected in a beaker and 2-3 drops methyl red was added to it, that turns the solution into slightly reddish colour. The contents of beaker were titrated against 0.1 (N) NaOH, till colour change changed from red to pale yellow. The neutralization point was determined. Same procedure was repeated triplicate. The total amount of alkaloids was calculated by considering the following equivalent:

1 ml 0.1N HCl ≡ 0.0162 g alkaloid

Estimation of Total Phenolic Content

Total phenol content of *Tamarix ericoides* root was assayed by modified Dewanto *et al.*, 2002 and Jothi *et al.*, 2019 procedure. The different concentrations of 10µg, 20µg, 40µg, 60µg, 80µg, and 100 µg were using an aliquot of diluted extract and added to 0.25mL of FolinCiocalteu reagent. The elucidation was adjusted with distilled water to a final volume of 3mL and shaken thoroughly. The solution was incubated and kept in the dark placed and read at 760nm was read against prepared blank. The total phenol content of plant parts was expressed as milligrams of gallic acid equivalents per gram of dry weight. The total sample was analysed in three replicates.

Estimation of Total Flavonoid Content

Total Flavonoid content in *Tamarix ericoides* root extract was analysed by the aluminium chloride colorimetric system M.M. Mervat, *et al* 2009 [11] and Jothi *et al*., 2019. 0.5ml of plant part extract of at different concentrations like 10µg, 20µg, 40 µg, 60 µg, 80 µg, and 100 µg were taken and the final volume was made up to 3mL with methanol. After that, 0.1ml $AlCl_3$ (10%), 0.1ml of potassium acetate and 2.8ml of distilled water were added continuously and test solution was vigorously shaken. After 30 minutes for the incubation periods, absorbance was recorded at 415 nm. The concentration of flavonoids in test samples was calculated and expressed as the equivalent of quercetin (QE) / g of sample. The entire sample was analysed in three replicates.

Fig: 1

Result and Discussion

Table: 1 Determination of Physico-Chemical Parameter of Tamarix ericoides root

Sample	Total ash (%)	Acid insoluble ash (%)	Water soluble ash (%)	Water soluble extractive (%)	Alcohol soluble extractive (%)	Moisture content (%)
Root	6.38	0.93	1.20	10.76	3.43	5.21

Table: 2 Premilanary phytochemical analysis of Tamarix ericoides root

Sr. No.	Phytochemical	Test	Acetone	Methanol	Aqueous
1	Alkaloids	Wagener's	+	+	-
		Hangers	-	+	+
2	Protein	Millions	+	+	+
		Biurret	+	+	-
3	Carbohydrate	Benedict's	+	+	+
4	Tannins	Lead acetate	+	+	+
5	Flavonoids	……..	+	+	+
6	Steroids	……..	+	-	+
7	Phenol	…….	+	+	+
8	Quinine	…….	+	+	-
9	Coumarine	……	-	+	+
10	Cardic glycoside	……..	+	+	-
11	Saponins	……	+	+	+

The present investigation reveals standardization which includes Moisture Content(5.21%), Total ash (6.38%), Acid insoluble ash (0.93%), Water soluble ash(1.20%), Water soluble Extractive value (10.76%), Alcohol soluble Extractive value (3.43%), phytochemical screening, and further isolation and further isolation of important phytoconstituents like carbohydrate, tannins, Flavonoids, proteins, phenol etc. from above result it is concluded that more phytoconstituents are present in acetone, methanol, and aqueous extract. This information will be used in drug discovery in pharmaceutical field.

Table 3: Quantitative phytochemical analysis of *Tamarix ericoides* root. in µg/ml

Phytochemicals	Acetone	Methanol	Aqueous
Alkaloids	2.921	2.006	1.045
Flavonoids	0.981	1.026	0.783
Phenols	1.754	1.816	0.859

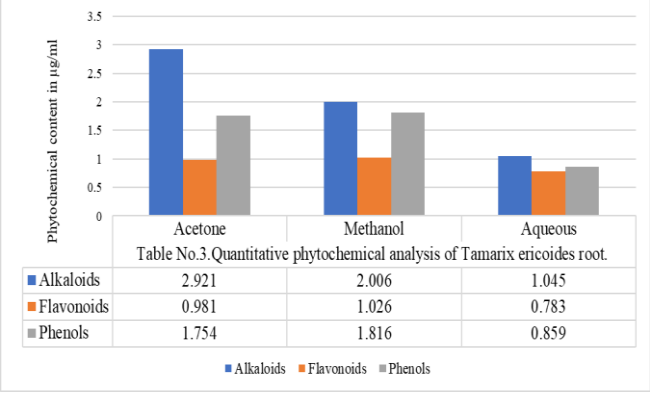

Fig 2

The quantitative studies were carried out in the same solvent mentioned above f No.3, Alkaloid content in *Tamarix ericoides* root extract that was 2.921, 2.006 and 1.045 µg/ml

respectively. The highest Alkaloid content in solvent extract of acestone followed by methanol and aqueous.

Total flavonoids in *Tamarix ericoides* root extract was 0.981,1.026 and 0.783 µg/ml respectively, highest content found insolvent extract of Methanol followed by Acestone and aqueous solvent extract (Table no. 3) and also followed by total content of phenols that was 1.754, 1.816 and 0.859µg/ml,

Conclusion

Tamarix ericoides root is the rich source of phytochemicals, alkaloid, Quinine, Cardic glycoside, Carbohydrate, Coumarine, tannin, flavonoids, saponins, steroid and phenols. Its extraction in acetone solvent shows highest intensity and content of phytochemicals in acestone followed by methanolic extract of *Tamarix ericoides* root and least in aqueous So, *Tamarix ericoides* root presence different phytochemical compounds useful for Further purification, identification and characterization of the active compounds of *Tamarix ericoides* root would be our priority in future studies and this data help for the selection of solvent for extraction.

References

1. Kokate CK, Purohit AP, Gokhale SB. "Pharmacognosy", Nirali Prakashan, Pune, 2005.
2. Koche DK, Shirsat RP, Syed I, Bhadange DG. "Phytochemical Screening of Eight Folk Medicinal Plants from Akola District (M.S) India", International Journal of Pharma and Bio Sciences. 2010; 1(4)256-261.
3. Koche DK, Shirsat RP, Syed I, Bhadange DG. "Phytochemical Screening of Eight Folk Medicinal Plants from Akola District (M.S) India", International Journal of Pharma and Bio Sciences. 2010; 1(4)256-261.
4. Plummer DT. Introduction to practical biochemistry. 3rd 25. Ed. Tata McGraw Hill Publishing Company Limited, India, 1990.
5. Debnath *et al*. Estimation of Alkaloids and Phenolics of Five Edible Cucurbitaceous Plants and Their Antibacterial Activity. Int J Pharm & Pharm Sci, Vol 7, Issue. 2015; 12:223-227.
6. Harjinder Verma, Manita Demla. Standardization of whole plant of celosia argentea linn. IJPSR. 2012; 3(8):2695-2699.
7. Harborne JB. "Phytochemical Methods", Chapman & Hall Publication, London, 1992.
8. Harborne JB. "Phytochsemical Methods", 3rd Edition, Chapman & Hall Publication, London, 1998.
9. Khandelwal KR. Practical Pharmacognosy: Techniques and Experiments. Nirali Prakashan, 4th ed. India, 1998.
10. Kokate CK, Purohit AP, Gokhale SB. Pharmacognosy. 37th Edition. Nirali Prakashan, 2007.
11. Mervat MM, Far EI, Hanan A, Taie A. Antioxidant activities, total anthocyanins, phenolics and flavonoids contents of some sweet potato genotypes under stress of different concentrations of sucrose and sorbitol. Aust J Basic Appl Sci. 2009; 3:3609-16.
12. Bigoniya1 P, Singh CS, Srivastava B. Pharmacognosticaland physico-chemical
13. Chopra RN, Nayar SL, Chopra IC. "Glossary of Indian Medicinal Plants", Publication and Information Directorate, CSIR, New Delhi, 1956.
14. Kamble SY, Pradhan SG. "Flora of Akola District Maharashtra", Botanical Survey of India, 1988.
15. Standardization of Syzygiumcumini and Azadirachta indicaseed. Asian Pacific Journal of Tropical Biomedicine, 2012, S290-S295.
16. Naik VN "Flora of Marathwada", Aurangabad, 1998, I(II).