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Physicochemical and preliminary phytochemical analysis of *Talinum portulacifolium* (Forssk.) Asch. Ex Schweinf. Leaf

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Abstract
Talinum portulacifolium (Forssk.) Asch. ex Schweinf. is one of the important medicinal plant belonging to the family Portulacaceae. It is used as the common leafy vegetable in many countries. The study plant has many therapeutic values like anti-ulcer genic, ant diabetic, antimicrobial and antioxidant activities. The present study deals with the physicochemical and preliminary phytochemical analysis of *Talinum portulacifolium* leaf. Five different solvents like Petroleum ether, Chloroform, Methanol, Ethanol, Aqueous were used to obtain the extract. These extracts were subjected for physicochemical and qualitative phytochemical analysis by using the standard procedures. Physico chemical parameters like moisture content, total ash, water soluble ash and sulphated ash values were calculated. Alkaloids, flavonoids, glycosides and phenols are present in the all the extracts. These bioactive compounds obtained from the phytochemical analysis may be the responsible for the pharmaceutical activity.

Keywords: Phytochemical, physico chemical, portulacaceae, *Talinum*, flavonoids, alkaloids, ash value

Introduction
Herbal drugs play an important role in health care programmes in world wide. Peoples are looking alternative medicine for the modern medicine like Ayurveda, siddha and unani. This is because of undesirable effects of modern medicine [1]. The medicinal value of the herbs lies in their phytochemical compounds which produce distinct physiological actions on the human body. The most important of these compounds are alkaloids, tannins, and flavonoid and phenolic compounds. The active components of herbal remedies have the advantage of being combined with many other substances that appear to be inactive. However, these complementary components give the plant as a whole a safety and efficiency much superior to that of its isolated and pure active components [2]. Phytochemicals are expansively found at different levels in various medicinal plants and used in herbal medicine to treat diverse elements such as wounds, toothache, cough malaria and rheumatism diseases [3].
Talinum portulacifolium (Forssk.) Asch. Ex Schweinf. Belongs to the family Portulacaceae. This family is cosmopolitan and has 19 genera and it is distributed from Rajasthan to the peninsular region [4, 5]. The study plant has the richest medicinal value. It is used to treat arthritis, backache, ulcer, constipation and diarrhea [6, 7]. Leaf powder is used to treat diabetes, hepatitis, aphrodisiac, and mouth ulcers. The fresh leaves are used as stomachic. Root has tonic properties, used in the treatment of cough, pulmonary tuberculosis and gastritis. It is also used to treat dehydrating diarrhea [8]. The objective of the study is to analyse the physicochemical and preliminary phytochemical constituents of *T. portulacifolium* leaf.

Materials and methods
1. Collection and identification
The plant material was collected from Pungambadi, Erode District, and Tamilnadu, India. The plant material was identified by using the local floras [9, 10]. The plant was confirmed with the help of type specimens available in the Herbarium of Botanical Survey of India, Southern region center, Coimbatore, Tamil Nadu. The herbarium was deposited in the Vellalar College for Women (Autonomous) Herbarium, Erode 638 012, Tamilnadu.

2. Preparation of plant powder
Freshly collected leaf parts were cleaned with tap water to remove adhering dust and then shade dried.

The shade dried plants were mechanically ground to coarse powder and used for further analysis.

3. Physicochemical analysis
Freshly collected and shade dried plant powder was used for the analysis of moisture content, total ash, sulphated ash and water soluble ash. These physicochemical screening were done by the standard procedures [11, 12].

4. Preliminary phytochemical screening
Phytochemical screening of petroleum ether, chloroform, methanol, ethanol and aqueous solvent extracts of *Talinum portulacifolium* leaf was carried out by the following the methods [13, 15].

4.1 Test for Alkaloids
1 ml of sample was taken, to that few drops of drag and off reagent was added and observed for orange red colour.

4.2 Test for Amino acids
To the 2 ml of extract was taken and Ninhydrin reagent was added and boil it for few minutes, formation of blue colour indicates the presence of the Amino Acid.

4.3 Test for fatty acids
0.5 ml of extract was taken and mixed with 5 ml of ether and allow it to dry on filter paper. Transparency on filter paper indicates the presence of fatty acids.

4.4 Test for Flavonoids
1 ml of sample was taken, to that concentrated HCL and magnesium chloride was added and observed for pink tomato red colour.

4.5 Test for Anthraquinones
5 ml of extract was hydrolysed with dilute H2SO4, then add the 1 ml of benzene and 1 ml of NH4, formation of rose pink colouration suggested that presence of Anthraquinones.

4.6 Test for Cardiac Glycosides
1 ml of extract was taken and glacial acetic acid 0.4 ml and ferric chloride solution and conc. H2SO4 was added and observed brown colour ring.

4.7 Test for Coumarin
2 ml of extract was taken and 10% NAOH was added and shaken well for 5 minutes and observed yellow colour.

4.8 Test for Saponins
1 ml of sample was taken, to that 2 ml of H2O (shaken vigorously) was added and observed for foaming appearance.

4.9 Test for Phenols
1 ml of extract was dissolved in 0.5 ml of 20% sulphuric acid solution followed by the addition of few drops of aqueous sodium hydroxide solution and observed blue colour.

4.10 Test for Tannins
1 ml of sample was taken and few drops of 0.1% ferric chloride was added and observed blue / black colourization / brownish green.

4.11 Test for Steroids
1 ml of sample was taken; to that 10% concentrated H2SO4 was added and observed for green colour.

4.12 Tests for Terpenoids
1 ml of sample was taken; 2 ml of chloroform and concentrated H2SO4 was added and observed for reddish brown ring colour.

4.13 Test for Quinones
1 ml of sample was taken, to that aqueous ammonia (shaking) was added and observed for change in colour of aqueous layer (pink, red or violet).

Results and discussion
Physico chemical analysis
Quantitative determinations of various physico chemical parameters of the leaf powder were tabulated in Table 1. The results showed the total cash value of 28.6307 gms, water soluble ash 10.33% w/w. The same results obtained in *Talinum triangularae* [16]. The calculated sulphated ash was 34.56% w/w and total moisture content was 8.75% w/w.

Table 1: Physico- chemical values of leaf powder of *Talinum portulacifolium*

S. No	Parameters	Values obtained in percentage
1	Moisture content	8.675% w/w
2.	Total Ash	28.6307 gms
3.	Water Soluble Ash	10.33% w/w
4.	Sulphated Ash	34.56% w/w

Preliminary phytochemical screening
The qualitative phytochemical screening showed the presence of various secondary metabolites (Table - 2). The results showed the presence of amino acids, alkaloids, flavonoids, glycosides, phenols, tannins, saponins, steroids, anthroquinones, terpenoids, quinones, fatty acids and coumarins in all the extracts except aqueous extract. Amino acids, tannins, quinones and coumarins are not present in the aqueous extact. Alkaloids, flavonoids, phenolic compounds, steroids, tannins and triterpenoids are present in the ethanolic extract. Similar findings were reported in ethanolic extract of *Talinum portulacifolium* [17]. Methanol extract showed the presence of phenolics, flavonoids, tannins, alkaloids, saponins and steroids. This corroborates the previous finds from *Melia azedarach* L. [18]. Alkaloids, Aminoacids, Flavonoids, Saponins, Phenols, Tannins and Steroids were reported in the cladodes extract of *Opuntia ficus indica* [19]. The same findings was obtained from the leaf extract of the study plant.

Table 2: Preliminary Phytochemical Screening of *Talinum portulacifolium* leaf

S. No	Phytocompounds	Extracts				
		Petroleum Ether	Chloroform	Methanol	Ethanol	Aqueous
1.	Amino acids	+	+	+	+	+
2.	Alkaloids	+	+	+	+	+
3.	Fatty Acids	+	+	+	+	+
4.	Flavonoids	+	+	+	+	+
5.	Anthraquinones	+	+	+	+	+
6.	Glycosides	+	+	+	+	+
7.	Coumarin	+	+	+	+	-
8.	Saponins	+	+	+	+	+
9.	Phenols	+	+	+	+	+
10.	Tannins	+	+	+	+	-
11.	Steroids	+	+	+	+	+
12.	Terpenoids	+	+	+	+	+
13.	Quinones	+	+	+	+	-

(**'+'**) indicates presence; while (**'–'**) stands for absence.

Conclusion

The present study concludes the presence of various secondary metabolites like alkaloids, flavonoids, tannins, steroids, saponins, phenols, and glycosides present in the Physico chemical and phytochemical analysis of *Talinum portulacifolium*. The secondary metabolites from the study may be the responsible for its therapeutic activities like antiulcerogenic, antidiabetic, antimicrobial and antioxidant activities. Further studies should be performed for the activity of the bioactive compounds to use the selected plant species as potent drug.

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Conflicts of interest

The authors declare that they have no conflicts of interest.

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