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Study on Detection of Bioactive Compound from Fig Fruits

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Abstract: *Food rich in antioxidants plays an essential role in the prevention of disease. The present study compared content of phenolic and antioxidant, alkaloids, flavonoid , phenols and tannins, saponine, carbohydrate test, protein test activity of fresh fig fruits.*
These methods are recombinated as useful tool for evaluation of the total activity antioxidant in fruit. Fig fruit is consumed worldwide as a functional food. It contain phytochemical that have been related to health benefits..

Keywords: Fig fruit, Phytochemical analysis, etc

I. INTRODUCTION

Fig fruit is an important food. Antioxidant inhibits the production of reactive species. Total polyphenol anthocyanin, flavonoids and antioxidant capacity of fig extract is associated well with the colour appearance extract of darker variants when compared to fruit pulp. Fruit skin contributes the greatest phytochemical and antioxidant activity.

The common fig tree also sprouts from the root and stolon tissue. The fig is the edible fruit of *Ficuscarica* a species of small tree in the flowering plant family *Moraceaenative* to the Mediterranean region together with western and southern Asia. It has been cultivated since ancient time and is now widely used throughout the world. *Ficuscarica* is the type of species genus ficus, containing over 800 tropical and subtropical plant species.

Fig being decidulls and sub-tropical tree prefers areas having aroid or semiarid environment, high summer temperature, plenty of sunshine and moderate water. Although the plants can survive temperature as high 45 **°C** the fruit quality determinant beyond 39 **°C**. Fig is one of the most salt and drought tolerantcraps, it can tolerate a fairly high level sulphate or chloride salt, medium to heavy, calearous well drained deep (about 1 m) soil having ph of 7-8 is ideally suitable for cultivation of fig.

Rooting of hard wood cutting is the common method of propagation in fig. Rooting was the best in cutting from 3 year old wood with 30-40 cm length 1.5 cm diameter. Individual flowers are long styled of pistillate and fruits develop parthenocarpically. Popular cultivates include Poona, Canadian, Mission Kadoka Brown turkey. Fruit develops only on pollination by male flower.

Carpi fig is the most important variety is Calimyrnia. Fig is planted in sequence system of planting at spacing of 5x5 cm accumulating about 160 plants per acre pits of 0.6 cu m are dug for planting the cutting.

There are about 20 popular varieties of Fig that are being grown in different parts of the world. Some famous varieties of common Fig grown in different countries are White, Adriatic Black Mission Kodata and Conadira in California, Kalamon in Greece, Sultani in Egypt, Turkish cultivar known as Sari cop in Turkey and Calimyrria in United States. Short styled pistillate flower and functional staminate flowers Capri Fig are not edible but grown because it is the harbaite Fig (Blastrophage presence) which is necessary for pollination and setting fruits.

It is an intermediate type of first crop (known as Bredo) is the parthenocarpic, while the second crop (main) requires pollination like Smyrna types. Figs are one of the eldest known fruit of the world. Figs were known to be the poor man's food. Dried and grown Fig are high mineralized and iron. Figs have mild less active qualities.

Figs are rich in potassium, which helps in controlling blood pressure. Fig can also help in controlling aging effects by providing enough iron, estrogen, etc. Fig keeps hormones in check and boosts the energy as well. Figs are also great for skin, hair and nails. Mashed figs applied on the face can prevent acne. Figs are rich in antioxidant and therefore help in

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controlling the release of free radicals and chronic in inflammation. Figs are therefore believed to have prevention effects on these chronic health conditions.

Sample Collection:

Fig. 1: Fig fruit

II. MATERIAL AND MEHTODS

Day: 1 Chemicals:
1) Glacial acetic acid
2) Meta phosphoric acid
3) Sodium bicarbonate
4) 2, 6 Dichlorophenol indophenol
5) Dye reagent
6) Ethenol
7) Mayer's and wagner's reagent
8) HCL
9) NaOH
10) Zink dust 11)Fecl3.
12) Fehling solution A & B
13) Benedict's reagent
14) Ninhydrin

Requirement
1) Measuring cylinder
2) Glass beaker
3) Conical Flask
4) 10ml piptte
5) Motor and pistal

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6) Funnel
7) Distilled water

Collection of Sample:

Fresh fig fruits was collected from the local market of Vaijapur early in the morning. Method for sample preparation:- 288 gm of sample was taken ,washed with the tap water and peeled off .

The peeled off sample washomenaized using a motor pistalblenderby adding ethanol to it.After homonaization the sample was centrifuge at 15000 rpmfpr 15 min.

The Supernatant was collected by filtering the sample using filterpaper while the pellet was discarded.Then the filtered was used for phytochemical analysis.

Fig.2: Ethanolic sample

Fig.3: Ethanolic sample collection in centerifuge tube

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Fig.4: Supernatant

Fig.5: Filter ethanolic sample

DAY: 2

Chemical preparation :

Dye reagent:

Take the Sodium Carbonate measure with 42 mg.

Measure the 2, 6 dye chloroindophenol with 42 mg.

The with dye chloroindopheonl mixed with 200 ml D/W dissolved in conical flask.

Then 5 ml crude extract added with the 10ml of meta phosphoric [MP] solution (MP) solution.

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After the reaction the dye Solution is added with drop wise Crude extract.
And after reaction crude extract have colour change light pink colour is formed.

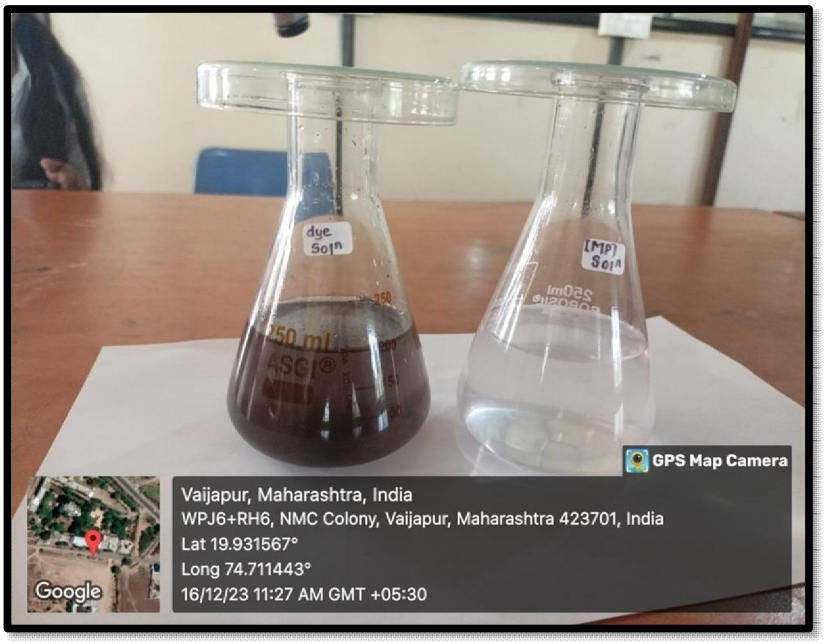
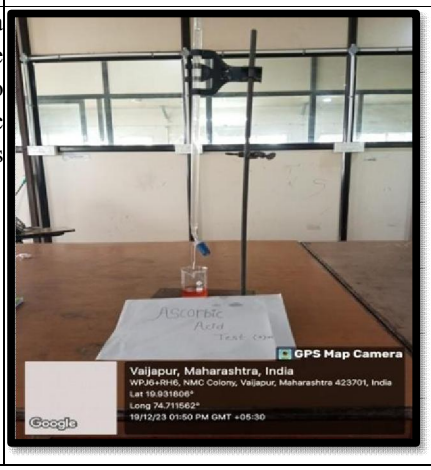


Fig.6: Dye solution & metaphosphoeric solution

Phytochemical analysis

1) Ascorbic acid test:

Test	Observation	Result
Measuring with 6 gm. meta phosphoric acid [MP] Solution. Take Glacial the Flask to dissolve to 2o ml acetic acid. The Glacial acetic acid and 180ml distilled water was added.		Ascorbic acid test was positive. light pink colour formed.

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DAY: 3

Phenolic test:

Test	Observation	Result
Ethanolic extract mixed 2 ml of 2% Solution of fecl3 . A blue-green black coloration indicats the presence of phenolos. Take a 2 test tube 2ml added . Fecl3 solution is added with Sample. 2- 3 drop added with phenol. After the reaction in few minutes latter the green colour from in phenolic test.		Phenolic test was positive. green colour was formed in phenolic test.

DAY 4:

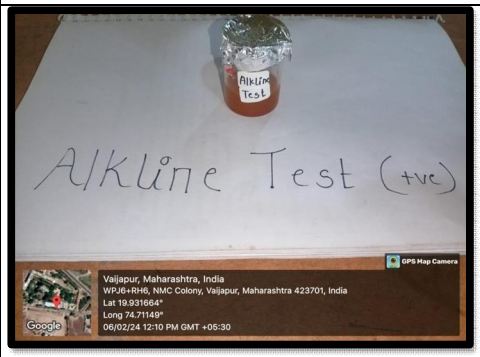
Phytochemical Analysis of Extract:

The extract was tested for the presences of bioactive compound by using following methods

Test of Alkaloids:

Test	Observation	Result
Ethanolic extract was dissolved in 2 ml of 1% HCL and heated gently. Mayer's and Wagner's reagents were then to the mixture. Turbidity of the resulting precipitate was taken evidence for the presence of alkaloids.		Turbidity was observed in ethanolic extract solution.

Test for Flavonoids: Alkaline reagent Test:

Test	Observation	Result
Ethanolic extract was mixed with 2ml of 2% solution of NaOH. An intense yellow colour was formed turned colourless on addition of few drops of diluted acid which indicated the presences.		Yellow colour was formed in ethanolic extract in presence of flavonoids.

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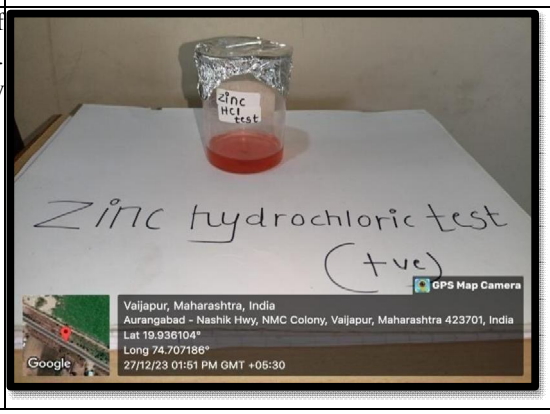
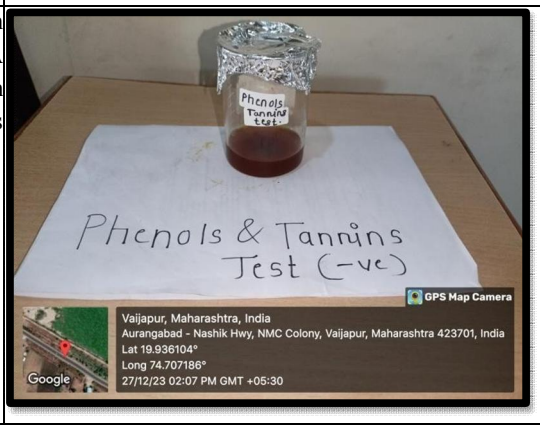
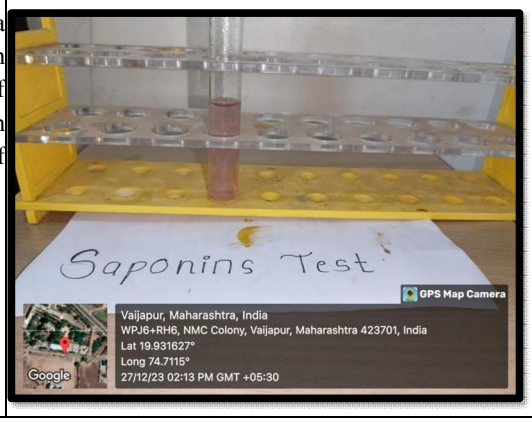
Zink Hydrochloric Test:

Test	Observation	Result
The test solution adds a mixture of Zink dust. conc. Hydrochloric acid. It gives red colour after a few minutes.		Red colour was formed in ethanolic extract solution.

Test for Phenols and Tannins:

Test	Observation	Result
Ethanolic extract was mixed with 2ml of 2% solution of FeCl3. A blue- green or black coloration indicates the presences of phenols and tannins.		A blue- green or black coloration indicates the not presence of phenols and tannins.

Test for Saponin:

Test	Observation	Result
Ethanolic extract was mixed with 5ml of distilled water in a test tube and it was shaken vigorously. The formation of stable from was taken as an indication for the presences of saponins.		Formation of light pink precipitates indicate the presence of saponins test.

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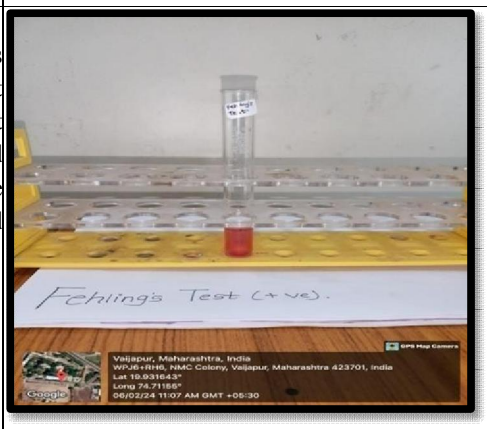
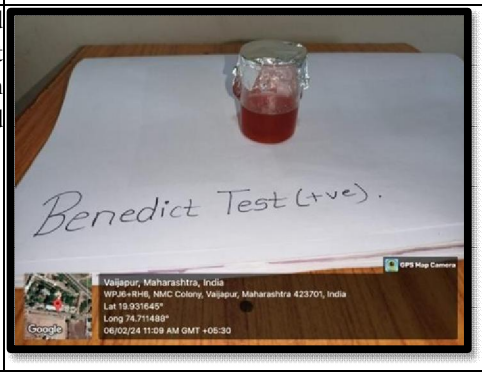
Day 5:

Test for Carbohydrate: Fehling's Test:

Test	Observation	Result
Equal volume of Fehling solution A and Fehling B reagents were mixed together and 2ml of it was added to ethanolic extract and gently boiled. A brick red precipitate appeared at the bottom of the test tube indicated the presences of reducing sugars.		A brick red precipitate appeared at the bottom of the test tube indicated the presences of reducing sugars**.**

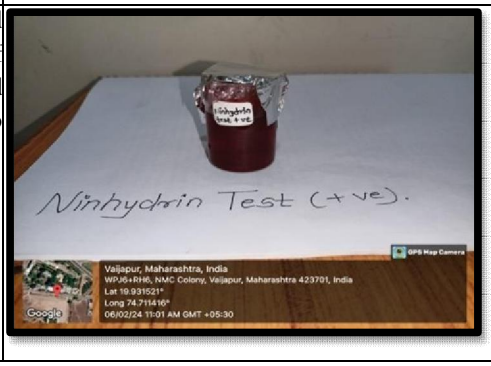
Benedict's Test:

Test	Observation	Result
Ethanolic extract when mixed with 2 ml of Benedict's reagent and boiled a reddish brown precipitate formed which indicated the presence of the carbohydrate.		A reddish brown precipitate formed which indicated the presence of the carbohydrate.

DAY 6:

Test for Proteins:

NinhydrinTest:

Test	Observation	Result
Ethanolic extract when boiled with 2 ml of 0.2% solution of Ninhydrin, violet colour appeared suggested the presences of amino acids and proteins.		A violet colour appeared suggested the presences of amino acids and proteins.

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Result:

Fruit name	Test									
No.	Ascorbic acid test	Phenolic test	Alk aloids	Flavonoid		Phenols and Tannins	Sap onine	Carbohydrate		Protein
				Alkali n e test	Zinc hydroch l oride test			Fehling's test	Benedict test	Ninhydrin test
Ethan o lic extract	+	+	+	+	+	-	+	+	+	+

III. CONCLUSION

The result of the study showed that the ethanolic extract of Fig fruit contains bioactive compounds.

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REFERENCES

[1]. R. K. Jangde, "Plant profile of Ficusreligosa : a review," Research Journal of Science and Technology, vol. 7, no. 4, p. 193, 2015.

[2]. M. Viuda-Martos, X. Barber, J. A. Pérez-Álvarez, and J. Fernández-López, "Assessment of chemical, physicochemical, techno-functional and antioxidant properties of fig (Ficuscarica L.) powder co-products," Industrial Crops and Products, vol. 69, pp. 472-479, 2015.

[3]. S. Ercisli, M.Tosun, H. Karlidag, A. Dzubur, S. Hadziabulic, and Y. Aliman, "Color and antioxidant characteristics of some fresh fig (Ficuscarica L.) genotypes from northeastern Turkey," Plant Foods for Human Nutrition, vol. 67, no. 3, pp. 271- 276, 2012.

[4]. R. Veberic, M. Colaric, and F. Stampar, "Phenolic acids and flavonoids of fig fruit (Ficuscarica L.)in the northern Mediterranean region," Food Chemistry, vol. 106, no. 1, pp. 153-157, 2008.

[5]. Y.-X. Shi, Y.-K.Xu, H.-B.Hu, Z. Na, and W.-H. Wang, "Preliminary assessment of antioxidant activity of young edible leaves of seven Ficus species in the ethnic diet in Xishuangbanna, Southwest China," Food Chemistry, vol. 128, no. 4, pp. 889-894,

[6]. H. Nawaz, R. Waheed, and M. Nawaz, "Phytochemical composition, antioxidant potential, and medicinal significance of Ficus," Modern Fruit Industry, vol .1-20, 2020.

[7]. P. Deep, K. A. Singh, M. T. Ansari, and P. Raghav, "Pharmacological potentials of Ficusracemosa a review," International.

[8]. J. J. K. Bankeu, R. Khayala, B. N. Lenta et al., "Isoflavone dimers and other bioactiveconstituents from the figs of Ficusmucuso," Journal of Natural Products, vol. 74, no. 6, pp. 1370- 1378, 2011

[9]. B. Moraceae, Q. Yannick, S. F. Fongang et al., "Phytochemistry Letters Flavonoids and other bioactive constituents from Ficusthonningii," Phytochemistry Letters, vol. 1-7, 2014.

[10]. A. Solomon, S. Golubowicz, Z. Yablowicz et al., "Antioxidant activities and anthocyanin content of fresh fruits of common fig (Ficuscarica L.)," Journal of Agricultural and Food Chemistry, vol. 54, no. 20, pp. 7717-7723, 2006.

[11]. O. Yemiş, E. Bakkalbaşi, and N. Artik, "Changes in pigment profile and surface colour of fig (Ficuscarica L.)during drying," International Journal of Food Science and Technology, vol. 47, no. 8, pp. 1710-1719, 2012.

[12]. I. N. Tomita, A. Manzoli, F. L. Fertonani, and H. Yamanaka, "Amperometric biosensor for ascorbic acid," EcléticaQuímica, vol. 30, no. 2, pp. 37-43, 2005.

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[13]. A. V. Carvalho, R. de Andrade Mattietto, A. de Oliveira Rios, R. de Almeida Maciel, K. S. Moresco, and T. C. de Souza Oliveira, "Bioactive compounds and antioxidant activity of pepper (Capsicum sp.) genotypes," Journal of Food Science & Technology, vol. 52, no. 11, pp. 7457- 7464, 2015.

[14]. M. Rodríguez-Ruiz, R. M. Mateos, V. Codesido, F. J. Corpas, and J. M. Palma, "Characterization of the galactono-1,4-

[15]. V. Govindan and F. G. Shoba, "Determination of nutritive value and mineral elements of Ficusbenghalensislinn.seed," Asian Journal of Pharmaceutical and Clinical Research, vol. 8, no. 4, pp. 156-159, 2015.

[16]. M. Sirajo, "Ascorbic acid, total polyphenols and antioxidant activity of Ficuscarica fruits," Journal of Food Chemistry and Nutrition, vol. 6, no. 1, pp. 21-27, 2018.

[17]. G. Pande and C. C. Akoh, "Organic acids, antioxidant capacity, phenolic content and lipid characterisation of Georgia-grown underutilized fruit crops," Food Chemistry, vol. 120, no. 4, pp. 1067-1075, 2010.

[18]. M. I. Barolo, N. Ruiz Mostacero, and S. N. López, "Ficus carica L. (Moraceae): an ancient source of food and health," Food Chemistry, vol. 164, no. April, pp. 119–127, 2014.

[19]. M. L. C. Caxito, C. P. Victório, H. B. Costa, R. M. Kuster, and C. R. Gattass, "Antiproliferative activity of extracts of Euphorbia tirucalli L (Euphorbiaceae) from three regions of Brazil," Tropical Journal of Pharmaceutical Research, vol. 16, no. May, pp. 1013– 1020, 2017.

[20]. N. Soni, S. Mehta, G. Satpathy, and R. K. Gupta, "Estimation of nutritional, phytochemical, antioxidant and antibacterial activity of dried fig (Ficus carica)," Journal of Pharmacognosy and Phytochemistry, vol. 3, no. 2, pp. 158–165, 2014.

[21]. Deepa, K. Sowndhararajan, S. Kim, and S. J. Park, "A role of Ficus species in the management of diabetes mellitus: a review," Journal of Ethnopharmacology, vol. 215, pp. 210– 232, 2018.

[22]. I. J. Pharm, P. Res, and P. Aspects, "Ficus carica Linn.: a review on its pharmacognostic, phytochemical and pharmacological aspects," International Journal of Pharmaceutical and Phytopharmacological Research, vol. 1, no. 4, pp. 215–232, 2012.