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Qualitative, quantitative screening and antifungal study of *Ficus Semicordata* Buch. -HAM. Ex Sm.

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Abstract
Objective: *Ficus semicordata* is an ethnomedicinal plant which has a numerous number of medicinal claims and it hasn't been explored thoroughly. Various parts of plant used medicinally such as used in skin disorder, leprosy, etc.To explore different qualitative, quantitative and antifungal aspect of *Ficus semicordata*.
Materials and methods: Different test were carried out to determine qualitative as well as quantitative parameter such as for the presence of protein, glycosides, alkaloids, carbohydrates, terpenoids, etc.
Result & Discussion: The three extracts were taken for examination such as water, methanolic and hydroalcoholic. The study was carried out on Ficus bark, leaves and fruit and for every sample three extract were prepared. And every extract shows different results. Also study revels *ficus semicordata* shows antifungal activity
Conclusion: The *Ficus semicordata* plant extracts could be used as an antifungal after comprehensive in vitro biological studies.

Keywords: *Ficus Semicordata*, antifungal activity, Phytochemical study

1. Introduction
Ficus semicordata is also known as *Ficus cunia* or *Ficus conglomerate*, commonly known as drroping fig, bhui goolar, khanayo, khaina. *Ficus* belonging to family Moraceae which comprices of the one of the largest genera of angiosperms with more than 750 species of trees, shrubs, hemiepiphytes, climbers and creepers in the tropics and subtropics worldwide. This genus is played very crucial role in genetic resource due to its very high economic and nutritional values. Also, it played an Important role in the biodiversity in the rainforest ecosystem. Plant parts used for medicinal purpose are leaves, Latex, Bark, Roots and Fruits. Drooping Fig is a small to medium sized tree [1].

Because of their medicinal and nutritional value qualitative and quantitative aspect were check for further use also as per traditional claim the plant parts were further analysed for antifungal activity.

Material and methods
Material Collection
Ficus semicordata was collected from Paikmal. Dist. Bargarh State, Orissa, India, as per standard procedure in the month of January 2018 with assistance of local guide. *Ficus semicordata* Herbarium was prepared and Authentication was done from BSI Kolkata provided with letter no.CNH/Tech.II/2018/11. Plant parts like leaf, bark and fruit materials were collected and thoroughly washed further dried under shade at 28 ± 2°C for about 10 days. The dried parts were ground well into a fine powder in a mixer grinder and sieved to give particle size of 50-150mm. The powders were stored in air sealed polythene bags at room temperature.

Phytochemical analysis
Extract preparation
Shade dried leaf, bark and fruit powders were subjected to maceration. The above obtained solid extracts were preserved in air tight bottles at 4 ºc in a refrigerator until further use.

Preliminary Phytochemical screening (Qualitative Study)
The extracts of the different parts were subjected to phytochemical screening for the presence of phytoconstituents like Alkaloids, Flavonoids, Phenols, Lignins, Anthroquinones, Steroids, Tannins, Saponins, Fixed Oils and Glycosides by using standard methods [2].

Quantitative study
1. Total Carbohydrate
In hot acidic medium, glucose is dehydrated to hydroxymethyl furfural. This forms a green coloured product with phenol (Phenol sulphuric acid method) (Krishnaveni *et. al.*, 1984) [3].

2. Total Protein
The proteins are first treated with copper ion in alkali solution, and then aromatic amino acids in the treated sample reduce the phosphomolybdatephosphotungstic acid present in the Folin reagent. The end product of this reaction has a blue colour. The amount of proteins in extracts was determined according to the method described by Lowry *et al.* (1951) [4].

3. Glycoside content
Glycosides react with Baljet's reagent and develop an orange-red color with (picric acid in alkaline medium). The glycosidic content of the plant extracts was determined

according to the method given by Mosa [5].

4. Total Phenol content
The total phenols were determined by Folin – Ciocalteau reagent method described by Malik and Singh (1980) [6].

5. Total flavonoid content
The total flavonoid content was determined by method of Khatiwora *et al.* (2010) [7].

6. Tannin content
The tannins in the extract react with potassium ferry cyanide ion and oxidized while the Fe (CN) 63- is reduced to ferry cyanide ion Fe (CN) 63-. Then this reacts with ferric ion to form ferric ferry cyanide (Graham, 1992) [8].

7. Terpenoid content
Terpenes and terpenoids are primary constituents of essential oils of different type of plants and flowers. Some qualitative estimation methods of terpenoids in plant tissue have been previously described but, there is no protocol of estimating the same quantitatively till date. In the present study, a protocol has been attempted to estimate the total terpenoids concentration of different resin producing plants using a monoterpene, Camphor as standard reagent (Ghorai *et al.*, 2012) [9].

In-vitro anti-fungal activity of Isolated compounds on *C. albicans*
The antifungal activity were done from Vasu research center Baroda India.
Culture used: *Candida albicans* (ATCC 10231)
Media Used: Sabroud dextrose agar (SDA) Make: Hi-media
Reference Standard Used: Itraconazole capsule – 100 mg
Culture Preparation: Freshly prepared slants of *C. albicans* was used and washed the slant by using 10 mL of sterile Normal saline solution. Method: Cylinder Plate Method Method for: 1) Media preparation: Sabroud Dextrose Agar was used for determining the activities of, Candida albicans. Media was prepared as per Manufacturer's Instruction. The media was then autoclaved at 121˚C temp. & 15lbs pressure for 20 minutes.

Method for
1. **Media preparation:** Sabroud Dextrose Agar was used for determining the activities of, *Candida albicans*. Media was prepared as per Manufacturer's Instruction. The media was then autoclaved at 121˚C temp. & 15lbs pressure for 20 minutes.
2. **Sample Preparation:** Take approximate 100 mg of sample & dissolved into 1:1 ratio of Methanol: Dimethyl Sulfoxide. Dissolved the samples by cyclomixture. Filter the samples & use filtrate to evaluate anti-fungal activity. 3) Standard preparation of: Itraconazole - 100 mg: Take weight of filled capsule. Active content of capsule i.e. pellets were powdered into mortar-pestle. Took powder equivalent to one capsule weight into 100 ml volumetric flask and make up the volume 100 ml with Dichloromethane. Solution was sonicated and prepared 50 mcg/ml standards solution by dilution method.
3. **Testing Procedure:** Cool down sterile media up to 55°C then measured 15 ml of SDA media by sterile measuring cylinder and transferred into sterile petri plate. Likewise, prepared 3 plates for evaluation. The plates were allowed to solidify on smooth surface. In rest of the media add 5µl fungal culture and mixed slowly. Then the media was poured on above SDA containing plates. The plates were solidified and then made required wells in SDA plates labeled them as a std. & test, at proper distance by sterile borer. Add std. & test samples in respected labeled well. When samples were diffused completely in well, incubate SDA plates into Biological Oxygen Demand (BOD) incubator at 25°C for 72 hours and observe the zone of inhibition.[10]

Result and Discussion
Preliminary Phytochemical Screening
The qualitative phytochemical test of water extract of *ficus semicordata* revealed the presence of flavonoids, phenols, anthraquinone, tannin, saponin, glycosides in leaves extract. phenols, anthraquinone, tannin, saponin, glycosides in bark extract. flavonoids, phenols, tannin, saponin, carbohydrates in fruit extract. The qualitative phytochemical test of methanol extract of *ficus semicordata* revealed the presence of flavonoids, phenols, anthraquinone, tannin, steroids, glycosides in leaves extract. Flavonoids, phenols, anthraquinone, steroids, tannin, glycosides in bark extract. Alkaloids, flavonoids, phenols, lignin, anthraquinone, tannin, glycosides, carbohydrates in fruit extract. The qualitative phytochemical test of hydroalcoholic extract of *ficus semicordata* revealed the presence of flavonoids, phenols, anthraquinone, tannin, steroids, glycosides, saponin in leaves extract. Flavonoids, phenols, anthraquinone, steroids, tannin, glycosides in bark extract. flavonoids, phenols, tannin, saponin, carbohydrates in fruit extract. The given data shown in table no.1

Table 1: Qualitative parameter of parts of *Ficus semicordata*

	Ficus semicordata									
Sr no	**Parameter**	**Waterm Extract**			**Methanol Extract**			**Hydroalcoholic extract**		
		Leaves	**Bark**	**Fruit**	**Leaves**	**Bark**	**Fruit**	**Leaves**	**Bark**	**Fruit**
1	Alkaloids									
	Mayer's reagent	-	-	-	-	-	+	-	-	-
	Wagner's reagent	-	-	-	-	-	-	-	-	-
2	Flavonoids									
	Shinoda test	+	-	-	+	+	+	+	+	+
	Lead Acetate test	+	-	+	+	+	+	-	+	+
3	Phenols									
	FeCl3 test	+	+	+	+	+	+	+	+	+
4	Lignins	-	-	-	-	-	+	-	-	+
5	Anthraquinone	+	+	-	+	+	+	+	+	-

6	Steroids									
	Salkowski test	-	-	-	+	+	-	+	+	-
7	Tannins									
	Lead Acetate test	-	+	+	-	+	+	+	+	+
	FeCl3 test	+	+	+	+	+	+	+	+	+
8	Saponin	+	+	+	-	-	-	+	-	+
9	Fixed Oils									
10	Glycosides	+	+	-	+	+	+	+	+	-
11	Proteins									
	Biuret Test	-	-	-	-	-	-	-	-	-
11	Amino Acid									
	Ninhydrin Test	-	-	-	-	-	-	-	-	-
12	Carbohydrates									
	Molisch test	-	-	+	-	-	+	-	-	+

+ Present; - Absent.

Quantitative Study

Quantitative estimation of carbohydrates, protein, phenolic, flavonoid, tannin, glycosides, terpenoids were done. In which ficus leaves show high percentage of carbohydrate than ficus fruit and ficus bark. Total protein and total glycosides show nil percentage. In total phenolic content ficus fruit show more percentage than ficus bark and ficus leaves. In total flavonoids content ficus leaves shows high content than ficus bark and ficus fruit. In total tannin content ficus fruit shows high content than ficus bark and ficus leaves. And total terpenoidal content ficus bark shows high percentage than ficus fruit and ficus leaves. The given data shown in table no 2

Table 2: Quantitative study of Parts of *Ficus semicordata*

Name of the test	Quantitative (in µg/ml) (*n*=3) (Mean±SD)		
	FB	**FL**	**FF**
Total Carbohydrates content	518.45± 96.55	1911.30± 445.70	1215.50± 327.45
Total Protein content	N.D.	N.D.	N.D.
Total Phenolic content	117.27± 0.141	38.05± 3.896	149.89± 20.202
Total Flavonoid content	130.93± 27.51	296.16± 55.12	254.31± 56.57
Total Tannin content	624.40± 24.45	587.00± 65.69	743.40± 65.50
Total Glycoside content	N.D.	N.D.	N.D.
Total Terpenoid content	1171± 27.12	381± 10.15	850± 32.11

Where
FB stands for *Ficus Bark*
FL stands for *Ficus Leaf*
FF stands for *Ficus Fruit*

Antifungal Activity

The antifungal study were done on total 5 sample. Blank is taken as one of the sample for checking strain. Reference sample were taken as itraconazole showing zone of inhibition as 24mm. FBM i.e Ficus bark methanolic extract showing zone of inhibition 13mm.FLM i.e Ficus leaves methanolic extract showing zone of inhibition 11mm.FFM i.e Ficus fruit methanolic extract showing zone of inhibition 14mm.

Table 3: Antifungal activity of *Ficus semicordata*

SR no.	Name of sample	Sample concentration	Zone of inhibition in mm
1	Blank	Methanol: DMSO	NZ
2	Reference Standard Itraconazole	50 mcg/ml	24 mm
7	FBM	100 mg/mL	13 mm
9	FLM	100 mg/mL	11 mm
11	FFM	100 mg/mL	14 mm

Conclusion

In methanlic extract study reveals the presence of flavonoids, phenols, anthraquinone, tannin, saponin, glycosides in leaves extract. Phenols, anthraquinone, tannin, saponin, glycosides in bark extract. flavonoids, phenols, tannin, saponin, carbohydrates in fruit extract. Methanolic extract against *C.albicans* shows the effective antifungal activity in all three parts i.e, bark, leaf, fruit of *Ficus semicordata*

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