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Preliminary Screening of Phytochemicals of Some Selected Medicinal Plants of Euphorbiaceae Family

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ABSTRACT: Since long time ago, herbal plant products are used to curing different infectious diseases. These plants have different types of metabolites known as primary and secondary metabolites, in which secondary metabolites possess verity of pharmacological activity like antimicrobial (antifungal & antibacterial), anti-inflammatory, antidiabetic, anticancer & antimalarial etc. Different plants of Euphorbiaceae family have potent antimicrobial agents in form of secondary metabolites. This investigation revealed to qualitative study of some selected medicinal plants extract included *B. retusa*, *B. montanum*, *C. acida*, *C. bonplanadianum*, *E. hirta*, *K. reticulate* & *M. philippensis*. Methanolic extracts of *B. retusa* have different types of phytochemicals. This study also represent the hydroethanolic solvent is the best extractive solvent for bioactive compounds.

KEYWORDS: Infectious disease, hydroethanolic solvents, pharmacological activity & phytochemicals.

I. INTRODUCTION

From ancient time, plants have been used as medicine by peoples, because they were believed that plants have healing powers¹. In Babylon circa 1770 B.C. and Egypt Circa 1550 B.C., founded earliest record of medicinal value of herbs. In fact, ancient Egyptians believed medicinal plants to have utility even in the afterlife of their pharaohs. Plants have been recovered from the Giza pyramids and can be found on display in a dark corner of Access Excellence Resource Center the Cairo Museum². Plants are best source for developing alternative drugs, extensively studied by advanced scientific techniques and reported for various medicinal properties viz, anticancer, antibacterial, antifungal, antidiabetic, antioxidant, hepatoprotective, hemolytic, larvicidal and anti-inflammatory activity, many of reports showed that these pharmacological activity indicated by phytoconstituents of plants³. Little knowledge is available about the antimicrobial activity of folklore medicines of Euphorbiaceae even though the antibiotic substances of few plants are known. This work is intended to screen different phytoconstituents found in some selected seven medicinal plants parts of euphorbiaceae family of in & around Rewa region.

II. Material Methods

For this investigation plants were collected locally from in & around Rewa district (M.P.). After collection plants were taxonomically identified. Then parts of selected plants were manually separated and allowed to shade dry and finally fine powder prepared. 20 gm of dried plants material is extracted by scientifically standerized method i.e. "Soxhlet extraction method" with different following solvents- petroleum ether, benzene, chloroform, acetone & ethanol (80%), after that eluted plant liquid material was dried. Finally extract obtained with each solvents were weighed and apply this formula-

$$(\text{Yield of plant extract/Wight of sample}) * 100$$

For yield of extracted bioactive compound (its percentage is calculated in term of the shade dried weight of the plant materials). The color and consistency of each extract is noted. The extract thus obtained is then subjected to qualitative



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test for identification of various plant constituents by method suggested by I. P. Tripathi et al., (2017). The detection of alkaloids were done by Mayer's reagent & Dragendraff reagent test. Carbohydrates by Molish's test and Fehling solution test, Glycosides by Borntrager's test and Legal test, Phytosterol by Liebermann's test & Liebermann's Burkhart's test Phenolic compound by Ferric chloride test & Lieberman test, Proteins by Xanthoproteic & Biuret test, Tannins by Lead acetate solution, Flavonoids by conc. H_2SO_4 & magnesium turing & also by 5% alcoholic aluminum chloride, amino acid by Ninhydrin test, Saponin by Foam test and G qualitative qualitative Gum & mucilage by Molish test.

III. RESULT AND DISCUSSION

The emergence of several pathogens has reawakened interest in chemotherapeutic and prophylactic agents for microbial disease. advanced scientific techniques studied that Plants are best source to develop various alternative drugs, which is reported for various medicinal properties for example, anticancer, antibacterial, antifungal, antidiabetic, antioxidant, hepatoprotective, hemolytic, larvicidal and anti-inflammatory activity³. Several bioactive contents can be isolated from plants (barks, leaves, flowers, roots, fruits and seeds). These separated phytochemicals (tannins, alkaloids, carbohydrates, terpenoids, steroids, flavonoids, phlobatannins, starch, glycosides, phytosterols and saponinetc) provide certain physiological action on the human body as prevent to chronic infectious diseases and also possess other pharmacological activities⁴.

After collection and authentication of collected plant parts extracted with Petroleum Ether (PE), Benzene (B), Chloroform (Ch), 95% Ethanol (E) and Water (W) with Soxhlet extraction (standard) method. Table 1 represents the results of Yields (%) of selected plant extracts (*B. retusa*, *B. montanum*, *C. acida*, *C. ponplandianum*, *E. hirta*, *K. reticulate*, *M.philippensis* & *S. grantii*) of euphorbiaceae family. When the desired compound has a limited [solubility](#) in a [solvent](#) for extraction of these type of compound, Soxhlet extraction method is used and it allows for unmonitored and unmanaged operation while efficiently recycling a small amount of solvent to dissolve a larger amount of material⁵. the solvent is removed, by means of a [rotatory evaporator](#) (after extraction), yielding the extracted compound. These extracted products found as mixtures of metabolites, in liquid or semisolid state form after removing the solvent. In present study we found highest yield of *B. retusa* of leaves of benzene extract (32.5%).

Table (1):- Yields of selected plants extract

S.No	Plant Name (Botanical Name)	Used solvent	Colour & Consistency	Yield (%)
1	<i>Bridelia retusa</i> (leaves)	Petroleum ether	Yellow Green	28.75 ± 0.0001
		Benzene	Dark Green	32.5 ± 0.0002
		Chloroform	Dark Green	31.0 ± 0.0003
		Ethanol (95%)	Dark Green	23.5 ± 0.001
		Water	Green	25.8 ± 0.0001
2	<i>Baliospermum montanum</i> (leaves)	Petroleum ether	Yellow	19.0 ± 0.0002
		Benzene	Yellow Brown	18.4 ± 0.0002
		Chloroform	Brown	22.0 ± 0.0001
		Ethanol (95%)	Black	30.0 ± 0.0001
		Water	Green	25.0 ± 0.001
3	<i>Cicca acida</i> (fruits)	Petroleum ether	Yellow	18.5 ± 0.0001
		Benzene	Light Yellow	23.0 ± 0.0001
		Chloroform	Green	25.5 ± 0.0002
		Ethanol (95%)	Dark Green	22.5 ± 0.0001
		Water	Green	16.5 ± 0.001
4	<i>Croton bonplandianum</i> (leaves)	Petroleum ether	Light Yellow	18.5 ± 0.002
		Benzene	Yellow	20.0 ± 0.0001
		Chloroform	Light Green	23.5 ± 0.0004
		Ethanol (95%)	Blackish Green	19.0 ± 0.0004
		Water	Green	24.0 ± 0.0001
5	<i>Euphorbia hirta</i> (Herbs)	Petroleum ether	Yellow	20.0 ± 0.0001
		Benzene	Dark Yellow	22.5 ± 0.0003
		Chloroform	Light Green	27.5 ± 0.001
		Ethanol (95%)	Green	21.5 ± 0.002
		Water	Green	17.5 ± 0.002
6	<i>Kirganelia reticulate</i> (leaves)	Petroleum ether	Yellow	16.0 ± 0.0001
		Benzene	Light Yellow	17.6 ± 0.0004
		Chloroform	Greenish black	18.8 ± 0.0004
		Ethanol (95%)	Light Green	21.0 ± 0.002
		Water	Dark Green	20.0 ± 0.001
7	<i>Mallotus philippensis</i> (leaves)	Petroleum ether	Green	20.0 ± 0.0001
		Benzene	Dark green	22.0 ± 0.002
		Chloroform	Yellow green	22.5 ± 0.0001
		Ethanol (95%)	Green	23.6 ± 0.0002
		Water	Dark green	21.7 ± 0.0002



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Ethanol, petroleum ether, water and methanol are the common solvents to extracts phytoconstituents of plant. Many of report show that hydroethanol possess highest hydroethanolic solvent was higher than water, whereas 50% hydroethanolic was observed to be the most effective solvent showing high antioxidant ability. Jonykwon seo et al.⁶, (2014), evaluated that 50% hydroethanol solvent observed as a most effective solvent which possess highest amount of TPC and showing highest antioxidant activity. The efficacy of methanol (80% & 90%) and ethanol leaf extracts (70 % & 90%) have been reported to be effective against pathogenic strains of *S. aureus*, *E. coli*, *P. aeruginosa*, *Staphylococcus epidermidis*, *Bacillus cereus*, *Bacillus subtilis*, *Listeria monocytogenes*, *Salmonella typhimurium*, *Salmonella enteritidis* and *K. pneumonia*, while some study demonstrated that the extracts demonstrated good antimicrobial activities against the Gram-positive and Gram-negative bacteria, except for *P. aeruginosa*⁷.

This study has revealed the qualitative phytochemical investigations were represented by table 2-4, of different parts of the selected plant extracts. Many of reports showed that medicinal plants have various bioactive compounds (secondary metabolites- for example terpenoid: exhibit various important pharmacological activities i.e., anti-inflammatory, anticancer, anti-malarial, inhibition of cholesterol synthesis, anti-viral and anti-bacterial activities, alkaloids: used as anaesthetic agents and are found in medicinal plants and phenolic compounds possess different pharmacological action etc), which are used for curing of various human diseases and also play an important role in healing⁸. In our investigation we found that the seven selected plants are rich in carbohydrate, phenol, protein, amino acid, alkaloid, sugar and flavonoid, whereas fixed oil and gum & mucilage were found to be absent accepted water extract of *B. retusa*. So in this result plant *B. retusa* having all these phytochemicals. Alkaloids are a large, diverse group of secondary metabolites, reported as antimicrobial, it is able to intercalate with the microbial DNA, while Terpenoids are reported to have anti-inflammatory, anti-malarial, anti-viral and antibacterial activity and Flavonoids are hydroxylated phenolic compounds produced by many plants to combat bacterial infections by interacting with the bacteria cell wall and proteins⁹. Our results indicate that on leaves of *B. retusa* & *E. hirta* which showed that it has some or all of these bioactive phytochemical compounds: terpenoids, flavonoids, tannins, alkaloids and saponins

Table (2):- Represent primary screening test of different phytochemicals

S. No	Phytochemicals	<i>B. retusa</i> (leaves)					<i>B. montanum</i> (leaves)					<i>C. acida</i> (fruits)				
		P E	B e	Ch l	E t	W t	P E	B e	Ch l	E t	W t	P E	B e	Ch l	E t	W t
1	Alkaloids	+	+	-	-	-	-	-	+	+	-	-	-	-	-	-
2	Carbohydrates	-	-	-	+	+	-	-	-	+	+	-	-	-	+	+
3	Glycosides	-	-	+	+	+	-	-	-	-	+	-	-	-	+	-
4	Phytosteroids	+	+	-	+	+	+	-	-	-	-	+	-	-	-	+
5	Fixed oil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	Saponin	-	-	-	+	+	-	-	-	+	+	-	-	-	+	+
7	Phenol	+	+	+	+	+	-	+	-	+	+	-	-	-	+	+
8	Tanin	-	-	-	+	-	-	-	-	+	-	-	-	-	+	+
9	Proteins	-	-	-	-	+	-	-	-	+	+	-	-	-	+	+
10	Amino acids	-	-	-	+	+	-	-	-	+	-	-	-	-	+	+
11	Flavonoids	+	-	+	+	+	-	-	-	+	-	-	-	-	+	-
12	Gum & mucilage	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-

Pe; Petroleum ether extract, Be; Benzene extract, Chl; Chloroform extract, Ee; Ethanol extract, Wt; water extract

Table (3):- Represent primary screening test of different phytochemicals

S. No	Phytochemicals	<i>C. bonplandianum</i> (leaves)					<i>E. hirta</i> (leaves)					<i>K. reticulate</i> (leaves)					
		P E	B e	Ch l	E t	W t	P E	B e	Ch l	E t	W t	P E	B e	Ch l	E t	W t	
1	Alkaloids	+	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-
2	Carbohydrates	-	-	-	+	-	-	-	-	+	+	-	-	-	+	+	
3	Glycosidase	-	-	-	+	+	-	-	-	+	-	+	+	-	-	-	
4	Phytosterols	+	-	-	-	-	+	-	-	-	-	+	-	-	-	-	
5	Fixed oil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	Saponin	-	-	-	+	+	-	-	-	+	+	-	-	-	+	+	
7	Phenol	-	+	+	+	+	-	+	+	+	+	+	+	-	+	+	
8	Tanins	-	-	-	+	+	+	+	-	+	+	-	-	-	+	-	
9	Proteins	-	-	-	-	+	-	-	-	+	+	-	-	-	+	+	
10	Amino acids	-	-	-	-	+	-	-	-	+	+	-	-	-	+	+	
11	Flavonoids	-	-	-	+	+	-	-	-	+	+	-	-	+	+	+	
12	Gum & mucilage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Pe; Petroleum ether extract, Be; Benzene extract, Chl; Chloroform extract, Ee; Ethanol extract, Wt; water extract

Table (4):- Represent primary screening test of different phytochemicals

S.No	Phytochemicals	<i>M. philippensis</i> (leaves)				
		PE	Be	Chl	Et	Wt
1	Alkaloids	+	-	-	+	+
2	Carbohydrates	-	-	-	-	+
3	Glycosidase	-	+	+	+	+
4	Phytosterols	+	-	-	-	-
5	Fixed oil	-	-	-	-	-
6	Saponin	-	-	-	+	+
7	Phenol	+	+	+	+	+
8	Tannins	+	+	-	+	-
9	Proteins	-	-	-	-	+
10	Amino acids	-	-	-	-	+
11	Flavonoids	+	+	-	-	-
12	Gum & mucilage	-	-	-	-	-

Pe; Petroleum ether extract, Be; Benzene extract, Chl; Chloroform extract, Ee; Ethanol extract, Wt; water extract

III. CONCLUSION

The results obtained in the present investigations indicates all selected plants of euphorbiaceae family have the potential to act as a source of useful drugs because of presence of various phytochemical components such as carbohydrate, protein, lipids, phenols, flavonoids and tannin. The results are highly encouraging but scientific validation is necessary before being put into practice.

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