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FORMULATION AND EVALUATION OF HERBAL TABLETS USING CADAMBA (ANTHOCEPHALUS CADAMBA)

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ABSTRACT

The Cadamba is one of the important medicinal plants belonging to the Rubiaceae family. It is crucially significant as it has the largest number of phytochemicals and secondary metabolites having pharmacological and biological properties.It is extremely important since it contains the most phytochemicals and secondary metabolites with pharmacological and biological qualities, such as cadambagenic acid, cadamine, quinovic acid, β-sitosterol, cadambine, etc. It can be helpful in the development of different disease-curing and preventative medicines worldwide. The alchoholic and aqueous extract of this plant showed significant antibacterial and antifungal activity against almost all the organisms, Micrococcus luteus, Bacillus subtilis, Staphylococcus aureus, Escherichia coli etc. In this context, antimicrobial potential. A cadamba against a wide range of microorganisms was studied. To validate the ethnotherapeutic claims of the plant in skin diseases, wound healing activity was studied, besides antioxidant activity to understand the mechanism of wound healing.

INTRODUCTION

Ayurveda is the life science and indicates knowledge of appropriate and inappropriate, happy or sorrowful conditions of living.

These include the following: Sadvritta, Svasthavritta, Ritucharya, Dinacharya, and Rasayana. The primary goal of this science is to keep people healthy and treat those who are sick.The goal of Ayurveda is to maintain health rather than treat illness. Traditional remedies are abundant in our nation's different cultures, many of which have botanical origins. Scientific data on such plant derivatives could be of clinical use. Anthocephalus cadamba commonly known as Kadam is a large tree up to 37.5 m high and 2.4m in girth with straight cylindrical bole. Leaves opposite, simple, elliptic-oblong; Flowers in solitary globose head, orange or yellow; Fruits pseudocarps, found all over India. In folk medicine it is used in the treatment of fever, uterine complaints, blood diseases, skin diseases, eye inflammation, diarrhoea, anaemia, leprosy, dysentery and stomatitis. The reported uses of this areanti-hepatotoxic, antimalarial, antimicrobial, wound healing, antioxidant, anthelmintic and etc. The major constituents of bark are triterpenes, tripernoid glycosides,saponins, indole alkaloids cadambine, 3α- dihydrocadambine, cadamine, isocadamine and isodihydrocada -mbin.Cholorogenic acid isolated from the leaves. The tribes of Ganjam district of Orissa drink the root paste duly suspendedin water in reducing blood sugar in the patients with diabetes mellitus. Studies substantiating its use in diabetes are lacking [1].

Plant Profile of Kadamba Leaves (Neolamarckia cadamba):

Kadamba, scientifically known as Neolamarckia cadamba, is a large evergreen tree belonging to the Rubiaceae family. The tree is known for its glossy, dark green, ovate leaves, fragrant orange.

Fig 1. Anthocephalus Cadamba Tree, Leaves and Flower

MATERIALS AND METHODS:

Materials:-

The main material used in this study was cadamba leaf extract. All materials used were of analytical grade Talc, Magnesium stearate, Gelatin, Poly vinyl pyrrolidone (PVP), Distilled water, Methanol and Mannitol Powder.

Method:-

Extraction Preparation

Kadamb leaf powder (10 g) of was mixed in RBF with 100 mL of methanol. It subject to microwave for 10 minutes at 280 W, and filtered through a 0.45µ filter. The extract was concentrated by rotavapor and the residue was stored for further study in a tightly closed container [2,3].

Fig 2. Powder of Anthocephalus cadamba leaf

Method of preparation of Herbal Tablet

Herbal tablets were made by wet granulation, and to obtain uniformly sized granules, the wet dough mass of all thoroughly combined materials was run through filter number 16. Following three to four hours of air drying, the granules were placed in a hot air oven set at 70 to 1000 degrees Celsius for 20 to 30 minutes. Talc and magnesium stearate were added as lubricants after the dried granules had undergone additional sieving. The tablets were then compressed using a tablet compression machine with die sets and punches from B Tooling [4, 5].

The formula for the herbal tablet

Ingredient	**F1**	**F2**	**F3**	**F4**
Cadamba leaf extract	3.50	4	4.5	5
Gelatin	21.5	22	22.5	23
PVP	7.5	7.5	7.5	7.5
Magnesium Stearate	6	6	6	6
Talc	5.5	5.5	5.5	5.5
Mannitol	Q.S to 100 mg	Q.S to 100 mg	Q.S to 100 mg	Q.S to 100 mg
Distilled water	Q.S	Q.S	Q.S	Q.S

[TABLE NO. 1]

Fig 3.Tablets Punching Machine

Fig 4. Anthocephalus cadamba leaf extract tablet

RESULT & DISCUSSION:

Wet granulation was used to successfully make the herbal tablets that included Anthocephalus cadamba extract. Numerous physicochemical characteristics and antibacterial activity were assessed for the prepared tablets**: Evaluation parameters [6, 7].**

Sr No.	Evaluation Parameter	F1	F2	F3	F4
1	Weight variation	3	4	3.5	2.5
2	Thickness test	5mm	5.8mm	3.9 mm	2.5mm
3	Hardness test	3 kg/cm^2	8.5 kg/cm^2	4.8 Kg/cm2	3.9kg/cm^2
4	Friability test	1.2%	3%	0.17%	1.1%
5	Disintegration test	5minute	17minute	13minute	8minute

[TABLE NO. 2]

Dissolution profile of F3

Sample	% Drug release, time in minute					
Time (minute)	10	20	30	40	50	60
Anthocephalus cadmba tablet	9.8	26.6	36.8	54.3	63.7	81.5

[TABLE NO. 3]

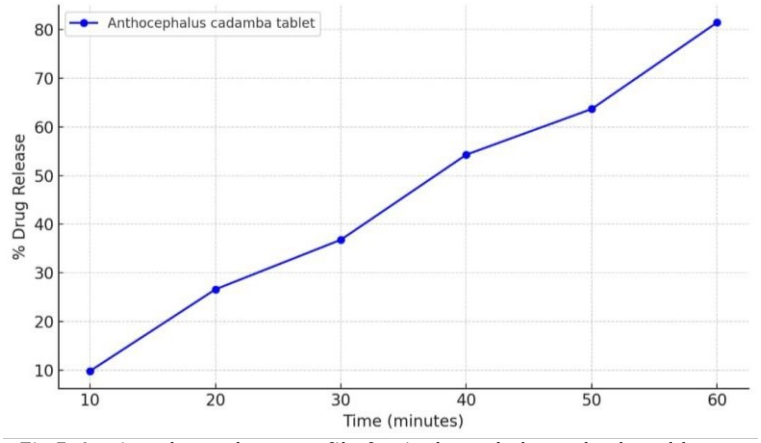

Fig 5. In-vitro drug release profile for Anthocephalus cadamba tablet

Microbial assay

The antibacterial activity of anthocephalus cadamba tablet (550 mg) was tested using the agar diffusion method [8-10].

Microbial assay

Bacterial Strain	A.Cadamba tablet	Positive control (ciprofloxacin)	Negative control (DMSO)
Escherichia coli	14 mm	22 mm	0 mm
Bacillus subtillis	15 mm	23 mm	0 mm

[TABLE NO. 4]

Gram-positive (B. subtilis) and gram-negative (E. coli) bacteria were both shown to be inhibited by the anthocephalus cadamba tablet, indicating that it has moderate antibacterial action [11]. According to these findings, the prepared Cadamba herbal tablets not only satisfy accepted pharmaceutical standards but also show encouraging antibacterial qualities, confirming its potential as a natural substitute for antibacterial treatment [12].

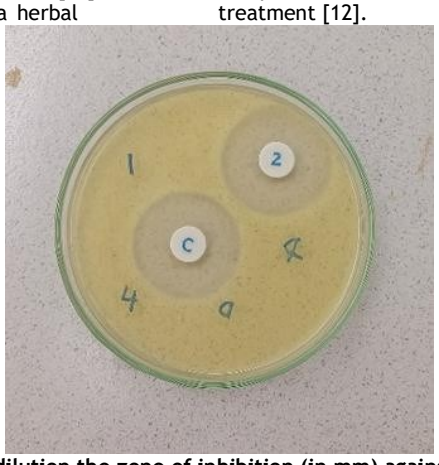

Fig 6. Anthocephalus leaves serial dilution the zone of inhibition (in mm) against B. subtillis & E. coli

CONCLUSION

The present study successfully formulated herbal tablets using Anthocephalus cadamba (Cadamba) extract and evaluated their physicochemical properties and antibacterial activity. The tablets met standard quality parameters, including hardness, friability, disintegration time, and drug content uniformity. In vitro antibacterial studies demonstrated significant activity of the Cadamba extract, particularly against common bacterial strains, supporting its traditional use in treating infections. These findings suggest that Anthocephalus cadamba possesses promising potential as a natural antibacterial agent and can be developed further into an effective herbal dosage form. Future research may explore clinical evaluations and formulation optimization for commercial application.

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