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## Develop and evaluate herbal antidepressant formulation

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### ABSTRACT

Depression is a state of feeling sad it is also as a psychoneutric disorder characterized by mental and functional activity and generation of suicidal tendencies. This study to develop a herbal anti-depressant formulation with a less adverse effect and to relative the symptoms of depression. Study of crude drugs under pharmacognostical schemes involves its depression. Method: Herbal tablet will be made using direct compression method. The plant used in herbal formulation Brahmi, Ocimum sanctum, Ashwagandha, extract was mixed with the excipients and compression in to tablet. Result:- To formulate a tablet dosage form with the help of herbal extract with good efficacy. Conclusion:-Newer medication and better facilities, treating depression. Patients with major depression have symptoms that reflect changes in brain monoamine neurotransmitters, specifically norepinephrine, serotonin and dopamine. According to a world health report about 450 million people suffer from a mental or behavioral disorder, yet only a small proportion of them received even the basic treatment.

**Key words:** *Depression, Neurotransmitter, Ocimum sanctum, Brahmi, Ashwagandha, Antidepressant*

### INTRODUCTION

Depression, which may defined in simpler term as a “state of feeling sad”. It is a psychoneurotic disorder which is characterized by mental and functional activity, sadness, loss of concentration, hopelessness and generation of suicidal tendencies, reduction in activity, feeling of dejection etc. Depression accounts for about 12 % of the global burden of disease which is expected to rise to 15 % by 2020.

### *Aim and Objective:*

- To develop and evaluate anti depressant formulation.
- To develop Anti-depressant a less adverse effect.
- To relieve the symptoms of depression.


### CAUSES OF DEPRESSION

1. Biological
2. Genetic
3. Environmental
4. Psychological

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## ANTI-DEPRESSANTS

It alters the chemical imbalances of neurotransmitters in the brain. This shows result in the reduction in symptoms of depressive disorders.

### Antidepressants and their classification

*Imipramine* was discovered in 1958 as an antidepressant regimen. The antidepressants have been divided into five groups:

- i. Tricyclic antidepressants (TCAs),
- ii. Selective serotonin-reuptake inhibitors (SSRIs)
- iii. Monoamine oxidase inhibitors (MAOIs),
- iv. Serotonin-norepinephrine reuptake inhibitor (SNRI) and
- v. Non-TCA antidepressants.

## HERBAL TREATMENT OF DEPRESSION

### *Hypericum perforatum L. (st. john's wort)*

- i. *Hypericum perforatum* of the flower of st. John's wort (SJW) (*Hypericum perforatum L.*) which is primarily used for the treatment of depression. Where the main active compounds is hypericin, also polycyclic phenols and pseudohypericin. Other compounds include flavonoids (hyperoside, quercetin, isoquercitrin, rutin), kaempferol, luteolinbiapigenin and hyperforin.

## MATERIAL AND METHODS

**Collection of plant raw material:** Bramhi, tulsi, Ashwagandha was collected from the botanical garden of Dr. C.V. Raman University bilaspur (C.G.)

**Identification of plant:** The plant were identified by Dr. Ashwini kumar dixit, botany department, Guru Ghasidas Viswavidyalya koni bilaspur(C..G.)

**Processing of plant specimens:** All the plant specimens are thoroughly cut by sharp weapon washed by water to remove dirt particles and it is stored in shade dry conditions.

- Ashwagndha roots are cut into pieces and dried immediately in sun stored in air tight containers.
- Brahmi and *Ocimum sanctum* was collected, air dried in shade and stored in air tight containers.

### Evaluation of Plant Raw Material as per WHO guideline

**Macroscopical Examination:** It is technique of qualitative evaluation based on the study of morphological and sensory profile of whole drugs.

### Extraction method

**Successive Solvent Extraction:** The soxhlet extraction is an automatic continous extraction

method with high extraction efficiency that requires less time and solvent consumption than maceration or percolation.

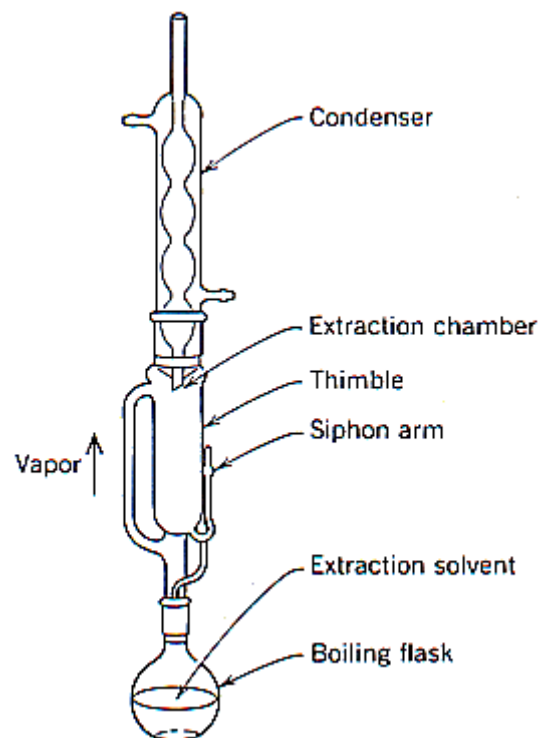


Fig. Soxhletion process

Using Soxhlet Apparatus by following solvent systems:

- Petroleum ether
- Chloroform
- Ethanol

**Petroleum ether extract:** The Air dried leaves of brahmi, Tulsi and roots of Ashwagndha (120 gms.) was extracted with 2-3 litter petroleum ether (32 °C) until the extraction was completed. After completion of extraction the solvent was removed by distillation. Brownish colored residue was obtained.

**Ethanol Extract:** The Air dried leaves of brahmi, Tulsi and roots of Ashwagndha (120 gms.) was extracted with (75-78 °C) until 2-3 litter ethanol extraction was completed. After completion of extraction the solvent was removed by distillation. Brown colored residue was obtained.

**Chloroform extract:** The Air dried sample leaves of brahmi, Tulsi and roots of Ashwagndha (120 gms.) was made into extracted with organic solvent chloroform (46ml) extraction was completed in (62 °c) using soxhlet apparatus. Yellowish color was obtained.

**Preparation of Herbal Anti-depressant formulation:**

Develop of Herbal Anti- depressant Formulation: Herbal tablets will be made using direct compression method. The plant extract was mixed with the excipients and compressed into tablets. The details of the composition are given are:-

Ingredients:-

- Plant Extract
- Ethyl cellulose
- Microcrystalline cellulose
- Dibasic calcium phosphate
- PEG 4000
- Carbopol
- Methyl paraben

**Ethyl cellulose:** It is used in coating agent, binder, filler.

**Microcrystalline cellulose:** It is used as Anti caking agent

**Dibasic calcium phosphate:** Used as directly compressible grades.

**PEG4000:** Used as lubricant.

**Carbopol:** Used as gelling agent water soluble polymer.

**Methyl paraben:** Preservative in the food.

Evaluation of herbal Anti - depressant Formulation: All the formulated tablets were subjected to following evaluation parameters:

- Weight variation test.
- Hardness test.
- Friability.
- Disintegration test.
- Dissolution test.

## RESULTS

### Pharmacognostic studies:

#### Macroscopical studies:

**Macroscopical characters of Withaniasomnifera root:** Roots straight unbranched, thickness varying with age, roots bear fibres like secondary roots, outer surface buff to gray yellow with longitudinal wrinkles; crown consists of 2-6 remains of stem base; stem bases variously thickened, nodes prominent only on the side from where petiole arises, cylindrical, green with longitudinal wrinkles, fracture, short and uneven, odour, characteristic, bitter and acrid. The roots were dryare cylindrical, gradually tapering down with a brownish white surface and pure white inside when broken.

**Macroscopical Characters of BacopaMonierri leaf:**

**Shape:** simple, opposite and decussate, glabrous obovate oblong to spatulate in shape,

**Size:** 0.6 -2.5 cm in length and 3-8 mm in width, entire, lower surface dotted with minute specks, obscurely 1-3 nerved,

**Color:** faint green.

#### Macroscopical Characters of Ocimum Sanctum

**leaf:** It is an erect, much branched sub-shrub 30-60 cm. Tall, with simple opposite green or purple leaves that are strongly scented and hairy stems. Leaves have petiole and are ovate, up to 5 cm long.

#### Physiochemical Analysis:

##### Withaniasomnifera root:

**Table - (a): Physiochemical Analysis of Withaniasomnifera root**

S. No.	Test	Result (%)
1.	Ash Value (%)	7.5
2.	Acid insoluble ash value	1.16
3.	Moisture Content	2.31
4.	Loss on drying 105°C (%)	4.17
5.	Water soluble ash value	12.05
6.	Alcohol soluble ash value	7.27

##### BacopaMonierri leaf:

**Table - (b): Physiochemical Analysis of BacopaMonierri leaf**

s. no.	Test	Result (%)
1.	Ash Value (%)	7.0
2.	Acid insoluble ash value	2.0
3.	Moisture content	8.0
4.	Loss on drying 105°C(%)	4.3
5.	Water soluble ash value	5.0
6.	Alcohol soluble ash value	4.0

##### Ocimum Sanctum leaf:

**Table - (c): Physiochemical Analysis of Ocimum Sanctum Leaf**

S. No.	Test	Result%
1	Ash value (%w/w)	8.8
2	Acid insoluble Ash value	3.9
3	Moisture Content	3.2
4	Los on drying 105°C	4.2
5	Water Soluble Ash value	3.4
6	Alcohol soluble Ash value	3.5

**(3) Phytochemical Analysis:*****Withania Somnifera* root:****Table – (a) Phytochemical Analysis of *Withania somnifera* root**

S. No.	Phytoconstituent	Petroleum Ether	Ethanol	Chloroform
1	Saponins	-ve	+ve	+ve
2	Alkaloids	+ve	+ve	-ve
3	Steroids	-ve	-ve	-ve
4	Volatile Oil	-ve	+ve	+ve
5	Flavonoids	-ve	+ve	+ve
6	Terpenoids	+ve	+ve	+ve
7	Glycoside	+ve	-ve	+ve
8	Tannins	-ve	-ve	-ve

***Bacopa Monierri* leaf:****Table - (b) Phytochemical Analysis of *Bacopa Monierri* Leaf**

S. No.	Phytoconstituents	Petroleum Ether	Ethanol	Chloroform
1	Saponin	+ve	+ve	+ve
2	Alkaloids	+ve	+ve	+ve
3	Carbohydrates	+ve	+ve	+ve
4	Proteins	-ve	-ve	-ve
5	Fats and fixed oil	-ve	-ve	-ve
6	Steroids	-ve	-ve	-ve
7	Glycosides	+ve	+ve	+ve
8	Tannins	+ve	-ve	+ve

***Ocimum Sanctum* leaf:****Table - (c) Phytochemical Analysis of *Ocimum Sanctum* Leaf**

S. No.	Phytoconstituents	Petroleum Ether	Ethanol	Chloroform
1	Triterpenoids	-ve	-ve	-ve
2	Alkaloids	+ve	+ve	+ve
3	Tannins	+ve	+ve	+ve
4	Flavonoids	-ve	-ve	-ve
5	Sugar	-ve	-ve	-ve
6	Proteins and Amino acids	-ve	+ve	-ve
7	Saponin	-ve	-ve	-ve
8	Fats and Oil	+ve	-ve	-ve

**(4) Determination of solvent extractive value (Soxhletion process)**

S.No.	Plant Name	Extracts (s)	Color and Consistency	Average Extracts % Yield
1	Ashwagandha	Petroleum Ether	Bronish	8.6%
	Tulsi	Petroleum Ether	Brown	8.2%
	Brahmi	Petroleum Ether	Brown	7.8%
2	Ashwagandha	Alcohol	Brownish	12.5%
	Tulsi	Alcohol	Brown	12.8%
	Brahmi	Alcohol	Yellow Brown	11.6%
3	Ashwagandha	Maceration	Brown	25% - 28%
	Brahmi	Chloroform	Yellow brown	30%
	Tulsi	Chloroform	Brown	28%

**(5) Development of Herbal Anti-depressant Formulation:****Table – Development of Herbal Anti-depressant Formulation**

S. No.	Ingredients	Batch No.				
		Quantity per tablet (mg)				
		F1	F2	F3	F4	F5
1	Plant Extract	400	400	400	400	400
2	Ethyl cellulose	-	-	--	20	30
3	Microcrystalline cellulose	40	40	40	40	40
4	Dibasic calciumphosphate	30	20	10	30	20
5	PEG 4000	10	10	10	10	10
6	Carbopol	20	30	40	-	--
7	Methyl paraben	0.1	0.1	0.1	0.1	0.1%
	<b>Weight per Tablet</b>	500	500	500	500	500

**6) Evaluation of Herbal Anti-depressant formulatrion:****Table – Evaluation of Herbal Anti-depressant formulation**

Batch No.	Hardness (kg/cm <sup>2</sup> )	Thickness (mm <sup>2</sup> )	% Weight Variation	% Friability	Disintigration Time
F1	4.2	3.5	2.51	0.69	9 min 50sec
F2	4.0	3.6	2.48	0.79	12 min 15 sec
F3	4.1	3.7	1.99	0.73	8 min 10 sec
F4	4.0	3.6	2.60	0.79	11 min 20 sec
F5	4.1	3.6	2.21	0.76	10 min 35 sec

**CONCLUSION**

Depression has vaulted from an obscure affliction to a high profile modern epidemic. From the present study, can be concluded that tablet is found to be have antidepressant and anxiolytic activity. Thus, this formulation can be used in prevention and treatment of depression and anxiety. The present study opens new windows for further researches on this various anti-depressant and

anxiolytic drugs. This may lead to a better integrative management of these psychiatric disorders in future.

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