

## Herbal Formulations Using Vellarugu-A Review

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### ABSTRACT

This review article is presented the preparation of herbal formulations by using vellarugu plant. it is also called as swallow wort. This tropical genus is widely distributed in South America, Africa and Asia. This plant is found in many diverse habitats from savannas, grassland, forests to beaches, from wet too very dry and also survives in a very saline environment. The various parts of India practising different types of medicines like Ayurveda, Siddha, Unani and Homeopathy. The plant is used in folk medicine to treat diabetes mellitus, rheumatism, abdominal ulcer, hernia, swelling, itching, insect poisoning, anti-inflammatory, hypoglycaemic, anticancer, digestant, liver tonic, anti-malarial, anti-pyretic etc. Pharmaceutical formulation is the multistep process where the active drug mixed with all other compounds by considering the factors of particle size, polymorphism, pH, solubility and becomes the final beneficial medicinal product. The development of a pharmaceutical formulation requires the combination of active ingredient with inactive excipients. Excipients may be simple bulking agents, designed to aid control of the dose content uniformity. Our objective of this review is to find out various kind of pharmaceutical formulation available in the market and those are listed as per the dosage form to understand the importance of the plant and further to develop a new formulation.

### I. INTRODUCTION

India had a long history of using varieties of traditional folk medicines to treat different diseases. The various parts of India practising different types of medicines like Ayurveda, Siddha, Unani and Homeopathy. Now a day all this are clubbed together and denoted as AYUSH. Even today, the World Health Organization (WHO) estimates that up to 80 percent of the world population still relies mainly on traditional remedies such as herbs for their primary health care<sup>[1]</sup>. Our plant is a well-known herb which is used as a medicinal drug in Ayurveda, Siddha, Unani, Allopathy, Homeopathy, Naturopathy and home remedies<sup>[2]</sup>.VELLARUGU {*Enicostemma Littorale* blume [E.Littorale] (*Enicostemma Hyssopifolium*)} plays a vital role in human healthcare<sup>[3]</sup>. E.littorale is a herbaceous plant belongs to Gentian family and seem to be rich in medicinal compounds<sup>[4]</sup>. According to Ayurveda literature survey, the fresh juice of leaves has been used as bitter tonic, to control arthritis, to treat typhoid fever & also act as cooling agent. The plant is traditionally used in the treatment of hepatic diseases and as blood purifier. It also acts as ethno-medicine for snake bites<sup>[5]</sup>. It is a perennial herb found throughout India and all other common areas. It is called as Vellarugu in Tamil, Chotachirayata in Hindi. The plant is used in folk medicine to treat diabetes mellitus, rheumatism, abdominal ulcer, hernia, swelling, itching, insect poisoning, anti-inflammatory, hypoglycaemic, anticancer, digestant, liver tonic, anti-malarial, anti-pyretic etc<sup>[6]</sup>.

### TAXONOMY OF PLANT:

- ❖ Kingdom : Plantae
- ❖ Subdivision : Angiospermae
- ❖ Class : Dicotyledonae
- ❖ Subclass : Gamopetalae
- ❖ Series : Bicarpellatae
- ❖ Order : Gentianales
- ❖ Family : Gentianaceae

- ❖ Species : Littorale
- ❖ Genus : *Enicostemma*<sup>[7-8]</sup>



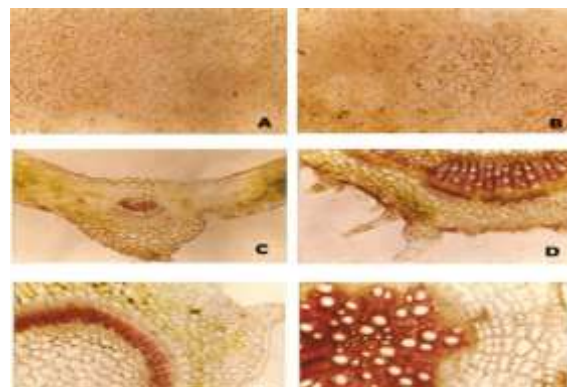
### MORPHOLOGY OF ENICOSTEMMA LITTORALE:

#### MACROSCOPIC FEATURES

It is an erect, perennial herb attaining height of 15-20inch. Simple or branched at the base. Stem cylindrical, glabrous with a decurrent ridge below each leaf, internode short 0.8 to 1.5cm long. Leaves are opposite decussate, lanceolate, 3-6 by 0.5-0.7cm, sessile of narrow green in colour, apex obtuse, 3 nerved, venation pinnate, upper surface rough, lower glabrous. Inflorescence in many flowered auxiliary clusters, numerous in the axis of each pair of leaves. Flowers are small white with green lines, drying yellowish, sessile (or) subsessile white green lines, whorled and in clusters 5merous, calyx narrow, 3-4mm long, campanulate. Divided down halfway to 2/3, thin, persistent in fruit, tubular to funnel shaped at the base contain numerous seeds. Ovary is without notary disk; stigmas capitate, slightly bilobed. Fruit a capsule, obovoid, seeds rounded, not winged. Root is cylinder, tapering, rough, secondary root filliform, 5-15cm length, 0.3-2.5cm in diameter, right yellow externally, creamish white, internally. Stamens inserted below the sinuses, just above the middle of the tube. Filaments 1.5-2.3mm long, with a double hood at the insertion point<sup>[9]</sup>.

#### MICROSCOPIC FEATURES:

The stem T.S appeared irregular circular (or) angular in out with wing-like protuberances, epidermis with walled square, rectangular-shaped cells xylem tissues formed a continuous ring-like structure apparent nearby circular in outside(near phloem region) pith formed a major broad (408.50-35.41) hollow zone in the inter compared to other zones<sup>[11]</sup>.



#### GEOGRAPHICAL DISTRIBUTION:

This tropical genus is widely distributed in South America, Africa and Asia. This plant is found in many diverse habitats from savannas, grassland, forests to beaches, from wet too very dry and also survives in a very saline environment.<sup>[10]</sup>

#### PHARMACOLOGICAL ACTION:

##### ANTI HYPERLIPIDAEMIC ACTIVITY:

The aerial part of this plant reduces the serum cholesterol levels in hepatoma bearing rats which induces hypercholesterolemia. A component of plant enhances cholesterol acyltransferase by esterification of free cholesterol in the HD<sup>[12]</sup>. A new study demonstrates a new property of swertiamarin as a potent lipid lowering agent when compared to atorvastatin and it may also contributes cardio protective and anti-atherosclerotic effect. The swertiamarin and atorvastatin when orally fed also lowered and the total serum cholesterol and triglycerides<sup>[13]</sup>. Hypolipidaemic antioxidant effect were evaluated by administrating an aqueous extract of it to rats (1.5g/body weight /day) along with hypercholesterolaemic diet for 6 weeks. The treatment with this extract decreases the activities of erythrocyte GAT, SOD and LPO levels with an increase in reduced glutathione levels, liver were also decreased in treated rats when compared to cholesterol fed untreated rats<sup>[14]</sup>.

##### ANTI INFLAMMATORY ACTIVITY:

Anti inflammatory activity of *Enicostemma axillare* was studied by using inhibition of albumin denaturation technique which was studied according to Mizushima et al<sup>[15]</sup> and Sakat et al<sup>[16]</sup> followed with minor modifications. The reaction mixture was consist of extracts and

1% aqueous solution of Bovin albumin fraction, PH of the reaction mixture was adjust using small amount of 1N HCl. The sample extracts were incubated at 37c for 20mins and then heated to 51c for 20mins. After cooling the sample the turbidity was means at 660nm<sup>[17]</sup>.

#### **ANTI DIABETIC ACTIVITY:**

The effect of an aqueous E.Littorale whole plant extract is an antioxidant defence in alloxan-induced diabetic rats was observed by prince and Srinivasan<sup>[18]</sup>. Treating diabetic rate with oral administration of aqueous E.Littorale whole plant extract daily followed up to 45 days significantly. It decreases the blood glucose, SOD, CAT and GPX. The effectiveness of E.Littorale extract was compared with standard drug insulin. Vishwakarma et al stands the dose dependent effect with hot and cold aqueous extract of E.Littorale for three weeks induced type 1 diabetic rats<sup>[19]</sup>. Treatment of diabetic rats with stz significantly produced the carnial signs of diabetes-mellitus like weight loss, polyuria and polydipsia, increased the fasting blood glucose level and AUC glucose associated with decrease in insulin level. TLC finger-print profiles were established for the aqueous using high performance thin layer chromatography. The result suggested that E.Littorale potentiates anti diabetic activity and improves lipid profiles at a lose of 0.5 g/kg.

#### **ANTI ULCER ACTIVITY:**

The aerial parts of E.Littorale against aspirin, ethanol and pylori ligation induced ulcer in rats and bovine serum albumin [BSA] denaturation were examined for anti-inflammatory effects by Roy et al<sup>[20]</sup>. Pre treatment with aqueous extract of E.Littorale showed a dose-dependent decrease in the ulcer index against aspirin, ethanol challenge and pyloric ligation. The prior administration of the aqueous extract also reduce the total acidity, free acidity volume of gastric secretion and elevated the gastric PH. It was reported that the methanolic extract of E.Littorale possess antiulcer activity.

#### **ANTI-MICROBIAL ACTIVITY:**

Tanna et al reported the antifungal activity of E.Littorale<sup>[21]</sup>. The ethyl acetate extract show slight activity against *A. niger* and moderate activity against *C.albicans*. Praveena et al observed that the antimicrobial activity of E.Littorale against many pathogenic micro-organism by using different solvents like chloroform, ethyl acetate, methanol, petroleum ether<sup>[22]</sup>.

#### **ANTI OXIDANT ACTIVITY:**

E. Axillare showed potent antioxidant active with IC<sub>50</sub> values ranging from 13.26 to 24.36 µg/ml. However, the standard rutin and ascorbic acid exhibited better results with lower IC<sub>50</sub> values. In present study, potent antioxidant activity was observed using many methods for all extracts of E. Axillare. The preliminary phyto-chemical analysis indicated the presence of steroids and triterpenoids, phenol, saponins, glycoside and tannis in the methanol extract. The observed antioxidant activity may be due to the presence of any of these constituents in the extracts<sup>[23]</sup>.

#### **ANTI EDEMATOGENIC:**

Anti edematogenic and free radical scavenging activity of swertiamarin isolated from it. Swertiamarian a secoirdoid isolated from the ethyl acetate extract of E.axillare was evaluated for anti edematogenic acts using coorangeenan formalin and histamine induced paw oedema methods in rat subject<sup>[24]</sup>.

#### **ANTI HEPATOPROTECTIVE:**

Anti hepato protective effect of swertiamarin from it a D-galactosamine induced lines damage in rates. The isolated swertiamarin was found to be 100% pure by HPLC. In the acute toxicity studies, swertiamarin did not show any toxicity and morality up to 2000 mg/kg dose. Treatment with swertiamarin (100 and 200 mg/kg) doses D-GALN intoxicated rats showed reduced hepatic damage and lesser necrosis and bile duct proliferation. The maximum protection was observed at the dose of (200 mg/kg) between of swertiamarin and comparable with the stand silymarin (100mg/kg)<sup>(25)</sup>.

#### **ANTI TUMOUR:**

A significant enhancement of mean survival time of methanolic extract of E.littorale treated tumour bearing mice was found with respect to control group. Treat with methanolic extract of E.littorale enhance peritoneal cell counts. When these methanolic extract of E.littorale treat animals underwent intra peritoneal inoculation with DAL cells, tumour cell growth was found to be inhibited. After 14 days of inoculation methanol extract of E.littorale is able to reverse the changes in haematological protein and to term inoculation<sup>(26)</sup>.


**ANTI HELMINTHIC:**

Mishra and Shukla reported that *E.littorale* exhibits anti helminthic effects. The ethanolic extract of aerial parts of *E.littorale* blume were prepared and evaluated separately for finding an anti helminthic effect on adult Indian earthworm, *pheretima posthuma*. Five different consent of each extract were used in this anti helminthic activity in which the time of paralysis death of the worm were determined. This result indicate that an ethanolic extract of *E. littorale* was more potent than the petroleum ether extract<sup>(27)</sup>



**PHARMACEUTIAL FORMULATION:**

A various kind of pharmaceutical formulation were found in the market and those are listed as per the dosage form to understand the importance of the plant and further to develop a new formulation. Pharmaceutical formulation is the multistep process where the active drug mixed with all other compounds by considering the factors of particle size, polymorphism, pH, solubility and becomes the final beneficial medicinal product. The development of a pharmaceutical formulation requires the combination of active ingredient with inactive excipients. Excipients may be simple bulking agents, designed to aid control of the dose content uniformity.

**TABLE NO:1[TABLET FORMULATION]**



S.No	BRAND NAME	DOSAGE FORM	USES
1	HEMOJAS <sup>[28]</sup>	Solid	Anti-oxidant, detoxifier
2	ANUJA KASSTON <sup>[29]</sup>	Solid	Eliminate kidney stone
3	ANUJA ACTIFLEXAN <sup>[30]</sup>	Solid	Rheumatoid arthritis
4	ANUJA MILKOTONE <sup>[31]</sup>	Solid	Production of breast milk
5	HERBOSLIM <sup>[32]</sup>	Solid	Weight loss
6	BON-PIL-K2HD with advanced ca <sup>2+</sup> <sup>[33]</sup>	Solid	Bone strength, multivitamin
7	PIL-NAT GUT supplement to improve digestive <sup>[34]</sup>	Solid	Digestant for dog& cat
8	GLUTONE PIL-MD <sup>[35]</sup>	Solid	Enhance skin glow
9	HIMALAYA PLATENZA <sup>[36]</sup> 	Solid	Decrease platelet count
10	LORD'S ORTHOKURE TABLET 60'S <sup>[37]</sup>	Solid	Improve the collagen&Ca <sup>2+</sup> level

**TABLE NO:2[CAPSULE FORMULATION]**


S.NO	BRAND NAME	DOSAGE FORM	USES
1	NEXNURON CAPSULE <sup>[38]</sup> 	Capsule	Boost immunity, increase physical fitness
2	REJOINT CAPSULE <sup>[39]</sup>	Capsule	Arthritis, Osteoarthritis
3	ALSENCE STROMRIDE CAPSULE <sup>[40]</sup>	Capsule	Anti-fertility, sexual health treatment
4	LEPOSERIN CAPSULE <sup>[41]</sup>	Capsule	
5	VARICOSE CONTROL CAPSULE <sup>[42]</sup> 	Capsule	Antioxidant to promote healing
6	BECELAC FORT 3 CAP15'S	Capsule	Reduce inflammation, vitamin B

CAPSULE <sup>[43]</sup>	deficiency
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**TABLE NO:3[POWDER FORMULATION]**

S.NO	BRAND NAME	DOSAGE FORM	USES
1	KILLI VELLARUGU DRIED NATURAL HEBS <sup>[44]</sup> 	Powder	Reducing blood sugar level ,Hernia
2	LODHRA POWDER <sup>[45]</sup>	Powder	Acne, pimple
3	NUCGNEX FITOLY POWDER <sup>[46]</sup>	Powder	Help to weight loss, digestive function
4	BIBHITAKI POWDER <sup>[47]</sup>	Powder	Boost immunity, control cold and cough
5	CONSTICHEK BOTTLE OF108 gm POWDER <sup>[48]</sup>	Powder	Treat constipation
6	PROTIOST WOMEN200gm POWDER <sup>[49]</sup>	Powder	Enhance skin from inside& glowing outside
7	DHAANYAS-VELLARUGU POWDER <sup>[50]</sup>	Powder	Migraine, poisonous bite
8	THADAM-VELLARUGU POWDER <sup>[51]</sup>	Powder	Fever, cancer
9	YUVIKA CHIRAITA ASLI POWDER <sup>[52]</sup>	Powder	Upset stomach, loss of appetite
10	VAAIMAI VELLARUGU POWDER <sup>[53]</sup> 	Powder	Intestinal worms, skin disease
11	VANU BOTON ACTIVE GRANULES <sup>[56]</sup>	Powder	Cancer, constipation
12	NATURMED'S VACH POWDER <sup>[57]</sup>	Powder	Nasal congestion, anti-allergic properties



**TABLE NO: 4[OINTMENT FORMULATION]**

S.NO	BRAND NAME	DOSAGE FORM	USES
1	R.M. luliconazole cream1% w/w <sup>[58]</sup>	Ointment	Itching ,ringworm, rashes
2	Lukoskin ointment <sup>[59]</sup> 	Ointment	Skin care, promoting melanin synthesis
3	Hexilak gel (20gm) <sup>[60]</sup>	Ointment	Treatment of burns, redness, pain
4	Dermiford skin cream + rozaderm hand cream 15g <sup>[61]</sup>	Ointment	Treat skin infection ,skin care
5	Nilac tube of 20mg gel <sup>[62]</sup>	Ointment	Acne ,pimple ,inflammation
6	Allen derma plus <sup>[63]</sup>	Ointment	Skin infection
7	My copor cream 30gm <sup>[64]</sup>	Ointment	Antifungal cream, athlete's foot
8	Soronil 0.005% ointment <sup>[65]</sup>	Ointment	Swelling, dryness ,redness
9	Luliderm cream 10gm <sup>[66]</sup>	Ointment	Fungal infection like athletes foot
10	Kojivit gel 15gm pack of	Ointment	Skin lightening agent ,hyper




	11 <sup>0c</sup> [67]		pigmentation
11	Triben cream 20gm <sup>[68]</sup>	Ointment	Acne, treat wrinkles
12	Vasu kulon ointment  30gm <sup>[69]</sup>	Ointment	Infection of skin


**TABLE NO: 5 [SYRUP FORMULATION]**

S.No	BRAND NAME	DOSAGE FORM	USES
1	Caslaxsyrup 100ml <sup>[70]</sup> 	Liquid	Constipation
2	Dalmia astha-15syrup <sup>[71]</sup>	Liquid	Sneezing, itching, watery eyes
3	Cinco syrup(non-sugar base) <sup>[72]</sup>	Liquid	Anti-allergic medicine
4	Rheuma -7 syrup(sugar free)200ml <sup>[73]</sup>	Liquid	Rheumatoid arthritis
5	Hemojassyrup <sup>[74]</sup> 	Liquid	Detoxifying the bone, purify blood, itching


**TABLE NO:6[SOAP FORMULATION]**

S.No	BRAND NAME	DOSAGE FORM	USES
1	Kaira de-tan soap <sup>[75]</sup>	Soap	Treat sun exposed &tanned skin
2	Salyzap soap <sup>[76]</sup>	Soap	Acne
3	Neko daily hygiene soap <sup>[77]</sup> 	Soap	Extremely effective for minor skin infection
4	Himalaya herbals protective neem &turmeric soap <sup>[78]</sup>	Soap	Anti bacterial &anti fungal

**TABLE NO:7[HAIR OIL FORMULATION]**

S.No	BRAND NAME	DOSAGE FORM	USES
1	Mars hair growth oil by  GHC <sup>[79]</sup>	Hair oil	Anti dandruff ,stop hair fall
2	Amrutveni hair elixir <sup>[80]</sup>	Hair oil	Promote hair growth
3	Indulekhabhringer hair oil <sup>[81]</sup>	Hair oil	Reduce hair fall
4	90days miracle hair oil tribe hair oil <sup>[82]</sup>	Hair oil	Prevent hair fall
5	Man matters advanced hair oil <sup>[83]</sup>	Hair oil	Stop hair fall
6	Deyga pre mature greying oil <sup>[84]</sup>	Hair oil	Anti dandruff
7	Brillare real mahabhringraj oil <sup>[85]</sup>	Hair oil	Promote hair growth


**TABLE NO:8[SHAMPOO FORMULATION]**

S.No	BRAND NAME	DOSAGE FORM	USES
1	Khadinabralneem sat praben free herbal cleanser <sup>[86]</sup> 	shampoo	Anti dandruff, cleaner dead cells & repair damaged hairs
2	Keemuda indian white water conditioner 200ml <sup>[87]</sup>	Shampoo	It smoothens & Nourishes dull & damaged hair
3	Herbal black hair shampoo <sup>[88]</sup>	Shampoo	Cure white hair problem & hair fall
4	Bringhraj shampoo 100ml <sup>[89]</sup>	shampoo	Keep hair smooth and help hair damage

**TABLE NO:9[LOTION FORMULATION]**

S.No	BRAND NAME	DOSAGE FORM	USES
1	Flu cort skin lotion <sup>[90]</sup>	Lotion	Skin inflammation, itching
2	Hapdco calendula plus lotion 50ml <sup>[91]</sup>	Lotion	Anti septic, anti bacterial
3	Verena gel 10gm <sup>[92]</sup> 	Lotion	Treat vaginitis, cervicitis
4	Aldry lotion <sup>[93]</sup>	Lotion	Anti perspirant
5	Melgain lotion 2ml <sup>[94]</sup>	Lotion	Treat vitiligo
6	Radikoj skin 15gm <sup>[95]</sup>	Lotion	Acne, anti aging
7	Propynatenf lotion <sup>[96]</sup>	Lotion	Dermatitis & psoriasis
8	Dermitop lotion 15gm <sup>[97]</sup>	Lotion	Skin disorder, red marks
9	Aquahold lotion <sup>[98]</sup> 	Lotion	Anti dandruff
10	Althea lotion 100ml <sup>[99]</sup>	Lotion	Moisturizer
11	Acnid lotion <sup>[100]</sup>	Lotion	Antiallergic & antiseptic
12	Clops bottle of 20ml nano lotion <sup>[101]</sup>	Lotion	Eczema, psoriasis, impetigo
13	Meolmenol org. glymed lotion <sup>[102]</sup>	Lotion	Hydrate the skin
14	Scabigard p lotion <sup>[103]</sup>	Lotion	Scabies
15	Ollent cream 50gm <sup>[104]</sup>	Lotion	Moisturisation
16	Kozilite lotion 50gm <sup>[105]</sup>	Lotion	Hyperpigmentation
17	Halotop s lotion <sup>[106]</sup> 	Lotion	Plaque psoriasis

**TABLE NO:10[CREAM FORMULATION]**

S.No	BRAND NAME	DOSAGE FORM	USES
1	Cosrx <sup>[107]</sup> 	Cream	It repairs & soothes irritated skin anti aging
2	Olive moisturizing cream <sup>[108]</sup>	Cream	Nourishing without causing any skin irritation

3	Re'equil skin radiance cream for hyper pigmentation & dark spots <sup>[109]</sup>	Cream	Treatment for acne pigmentation
4	Dear klairs rich moist soothing cream <sup>[110]</sup>	Cream	Promote immediate& long term moisture
5	Neutrogena hydro boost water gel <sup>[111]</sup>	Cream	Boost skin hydration level
6	Skin brightening cream <sup>[112]</sup>	Cream	Anti ageing
7	Conscious chemist pigmentation skin <sup>[113]</sup>	Cream	Dark spot removal ,exfoliating face tones
8	Ningen skin rejuvenating cream <sup>[114]</sup> 	Cream	Anti ageing
9	The face shop chia seed hydro cream <sup>[115]</sup>	Cream	A rich hydrating gel cream to moisture the skin damage

## II. CONCLUSION

This review work reveals that the plant has plenty of phyto-constituents with pharmacological actions so it has been used to formulate lot of formulations and also many of them were available in the market. Eventhough, due to the potency of the plant still many researches going on to formulate never versions of formulatrions.

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