

## Economic importance and market value of *Enicostemma Hyssopifolium* (willd.) verd

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### Abstract

The 'economics' and 'ecology' both have come from the same, root 'oikos' the greek word meaning house hold. The suffix 'logy' indicates the study of logic that maintains the house hold of man, while the suffix 'nomy' pertains to the science that deals with the distribution (of resources) in his house hold (i.e. environment). The two have similarity not only in their subject of inquiry but also in their finding that in the broadest sense "everything depends on everything else". Mankind and vegetation is not only integral part of an ecological web but also of an economic web, the two webs are studied separately essentially because of the limitations of human mind. *Enicostema hyssopifolium* is used to support healthy digestive, cardiovascular and urinary systems. It has been estimated that on an average 184 kgs of *Enicostema hyssopifolium* dried plant sold in Rewa town every year which gives an earning of Rs. 9180.00 annually.

**Keywords:** Economic Importance, Market value, *Enicostemma hyssopifolium*

### 1. Introduction

*Enicostemma hyssopifolium* (Chhota chirayata) is a common weed of grassland and more frequent in open fields. The herb contains glycoside and ophelic acid and used as laxative, stomachic, tonic and blood purifier. The juice of whole plant is recommended by the tribal and rural people to treat malarial fever. There is scanty literature available on the phytochemical estimation and antimicrobial effect of *Enicostemma hyssopifolium* till date. Gami *et al.*, (2011) worked on Screening of methanol & acetone extract of some medicinal plants species viz. *Alstonia scholaris* (stem bark), *Achyranthes aspera* (whole plant) *Moringa oleifera* (leaves), *Tinospora cordifolia* (stem), and *Enicostemma hyssopifolium* (stem). These were screened for their antibacterial activity. They also carried out phytochemical estimation of selected plant species. They showed the presence of protein, carbohydrate, saponins, tannin, glycoside, alkaloids, flavonoids, terpenoids, steroids and fixed oil. Our results agree with their finding in response to *Enicostemma hyssopifolium*. Patel (2010) analyzed the antibacterial activity of methanolic & acetone extract of some medicinal plants species. They concluded that the secondary metabolites of plants were more soluble in methanol than that of acetone. Present investigation agrees with their statement. Patel *et al.*, 2009 showed aldose reductase inhibitory activity of C-glycosidic flavonoids derived from *Enicostemma hyssopifolium*. They concluded that C-glycosidic flavonoid from *Enicostemma hyssopifolium* has significant activity against sugar-induced cataract in vitro. Patel *et al.*, 2009 worked on kinetic study for in-vitro intestinal uptake of monosaccharide across rat reverted gut sacs in the presence of some anti- diabetic medicinal plants. Little work has been reported on antibacterial activity of *Enicostemma hyssopifolium* the best of our knowledge till date. However extensive work on antibacterial activity of *Enicostemma axillare*, *Enicostemma littorale* in India has been done by many researchers. Gopal *et al.*, (2011) analyzed the in-vitro

antifungal activity of various extracts of *Enicostemma littorale*.

*Enicostema hyssopifolium* has been extensively studied, most of it in the last half of the 20<sup>th</sup> century, and much of it concentrating on *Enicostema hyssopifolium* pharmacological composition, safety, efficacy, and mechanisms of action. A good deal of this research has centered around a screening technique called signal transduction technology.

*Enicostema hyssopifolium* is very useful in hepatoprotective action. It improves non-specific immune response. Extracts of *Enicostema hyssopifolium* have been shown to stimulate powerful immune responses in living creatures. The immune response may be specific directed at a microbial invader already present in the body, or generally, strengthening the immune system in preparation against future infections. *Enicostema hyssopifolium* strongly stimulates phagocytosis and the production of specific antibodies.

*Enicostema hyssopifolium* is an herb commonly used in China, Sri Lanka, India and other countries in subtropical and Southeast Asia. Both the fresh and dried leaves, as well as the fresh juice of the whole plant, have been used in a variety of cultures.

There has been a great deal of research done with *Enicostema hyssopifolium*\*. Some of the benefits of this plant are as follows.

- 1. Cold and Flu :** Long known in traditional Asian medicine as an immune system booster, *Enicostema hyssopifolium* has demonstrated significant activity in fighting common cold, flu, and upper respiratory infections.
- 2. Anti-inflammatory:** *Enicostema hyssopifolium* contains many flavonoids, which have anti-inflammatory properties. The active component of *Enicostema hyssopifolium*, inhibits inflammatory responses eg. Reduces swelling and cuts down exudation from capillaries (Opara and Anasa, 1993).

\* Source: National Botanical Research Institute, Lucknow.

3. **Anti-tumor:** *Enicostema hyssopifolium* has anti-carcinogenicity properties. So it is used for curing of anti-tumor.
4. **Diabetes:** The ethanolic extract of *Enicostema hyssopifolium* possesses antidiabetic property. Its antidiabetic effect may be attributed at least in part to increased glucose metabolism. Used as blood sugar reducer.
5. **HIV:** The chemical constituents may inhibit HIV-induced cell cycle dysregulation, leading to a rise in CD<sub>4</sub> (+) lymphocyte levels in HIV- infected individuals.
6. **Immune system:** Most flavonoids have anti-microbial activity and have a positive effect on the immune system. *Enicostema hyssopifolium* has demonstrated significant activity in fighting common cold, flu, and upper respiratory infections. Extracts of *Enicostema hyssopifolium* have been shown to stimulate powerful immune responses in living creatures. The immune response may be specific directed at a microbial invader already present in the body, or generally, strengthening the immune system in preparation against future infections. *Enicostema hyssopifolium* strongly stimulates phagocytosis and the production of specific antibodies.
7. **Anti-oxidant and liver protection:** *Enicostema hyssopifolium* treatment prevents BHC induced increase in the activities of enzymes  $\gamma$ - Glutamyl transpeptidase, glutathione-S-transferase and lipid peroxidation. The activities of antioxidant enzymes like superoxide dismutase, catalase, glutathione peroxidase and the levels of glutathione were decreased following BHC effect. Administration of *Enicostema hyssopifolium* showed protective effects in the activity of superoxide dismutase, catalase, glutathione peroxidase, glutathione reductase as well the level of glutathione. The activity of lipid peroxidase was also decreased. The result indicate antioxidant and hepatoprotective action of *Enicostema hyssopifolium*.
8. **Anti-malarial activity:** Four xanthenes were isolated from the leaves of *Enicostema hyssopifolium*. In vitro study revealed that compound 1, 2-dihydroxy-6, 8-dimethoxy-xanthone possessed substantial anti-plasmodial activity against *Plasmodium falciparum*.
9. **Respiratory Tract Infections:** Acute respiratory infections represent a significant cause of over-prescription of antibiotics and are one of the major reasons for absence from work. The leaves of *Enicostema hyssopifolium* are used as a respiratory tract infection. *Enicostema hyssopifolium* is superior to placebo in alleviating the subjective symptoms of uncomplicated upper respiratory tract infection. There is also preliminary evidence of a preventative effect. Adverse events reported following administration of *Enicostema hyssopifolium* were generally mild and infrequent. There were few spontaneous reports of adverse events. *Enicostema hyssopifolium* may be a safe and efficacious treatment for the relief of symptoms of uncomplicated upper respiratory tract infection. The *Enicostema hyssopifolium* promotes mucus discharge from the respiratory system.
10. **Antimicrobial activity:** The antimicrobial activity of aqueous extract, andrographolides and arabinogalactan proteins from *Enicostema hyssopifolium* were evaluated. The aqueous extract showed significant antimicrobial

activity, which may be due to the combined effect of the isolated arabinogalactan proteins and Andrographolides. It has remarkably beneficial effect in reducing diarrhea and symptoms arising from bacterial infections.

## 2. Material and Methods

States that economics concern's with humans behaviour in relation to production, consumption and exchange of goods and services the human wants are unlimited, while the resources available are limited, this not only gives rise the problem how to satisfy unlimited wants from limited means, but also creates the imbalance in the environment. This justifies the statement that there is everything for human needs but not for greed.

*Enicostema hyssopifolium* is annual herb in the domestic medicine called 'Chiraita', which is given to infants. Both in Ayurveda and Unani systems.

For centuries, the Ayurvedic practitioners of India have used the herb *Enicostema hyssopifolium* to treat ailments ranging from poor digestion to hepatitis. In the Chinese medical tradition, the plant has been used to treat everything from gastrointestinal complaints to throat infections. Although some early scientific studies suggested that *Enicostema hyssopifolium* has a direct antimicrobial action, the weight of clinical evidence now shows that the real value of this ancient herb is as a stimulant for the immune system.

*Enicostema hyssopifolium* is grown in very less amount for the save of medicinal value. The crop is cultivated in most part of India.

## 3. Results and Discussion

*Enicostema hyssopifolium* is a herb found throughout India and other Asian countries. *Enicostema hyssopifolium* has become popular in Scandinavia for use during winter upper respiratory infection.

A general survey was conducted in Rewa Ayurvedic medicine shops which sale the raw plant to the Vaidyas and indigenous medicine makers. It has been estimated that on an average 184 kgs of *Enicostema hyssopifolium* dried plant sold in Rewa town every year which gives an earning of Rs. 9180.00 annually (Table 1).

According to preliminary information (Bhatnagar, 1990) only a fractions of the total collection is locally used, the bulk finds its way out to major markets. However, some quantities are purchased by Govt. Ayurvedic pharmacies of Madhya Pradesh, Ayurvedic College of Madhya Pradesh. They also requires some medicinal plants.

According to Bhatnagar (1990), the Govt. Ayurvedic pharmacy Gwalior, Raipur and Unani Pharmacy Bhopal consume about 1160 kg of *Enicostema hyssopifolium* plant annually.

The consumption and sale of the three very important Ayurvedic drugs Chooran, Tablet and Kadha (decoction) made from *Enicostema hyssopifolium* has been recorded and presented in tables 2-4.

It has also been recorded from the significant Ayurvedic shops of Rewa town giving an annual earning of Rs. 47400.00, 7645.00 & Rs. 40260.00 respectively.

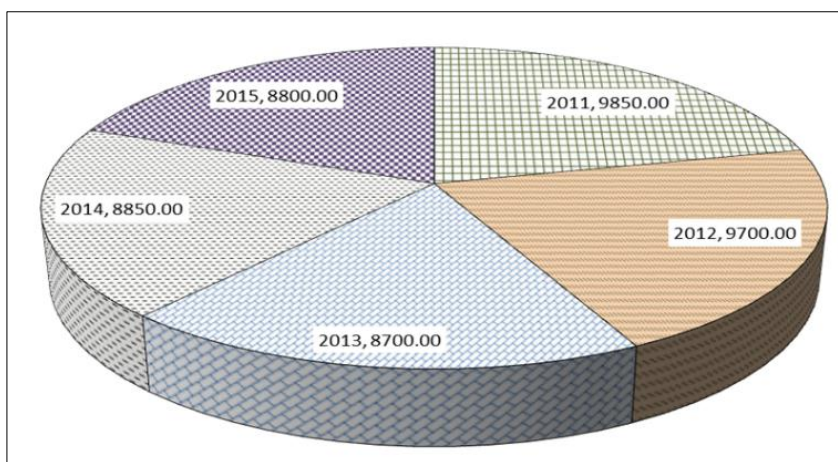
So if *Enicostema hyssopifolium* maintained properly and cultivated on large scale it can also provide employment to the weaker sections of the society.

**Table 1:** Consumption of *Enicostema hyssopifolium* in the last five years in Rewa City.

S. No.	Years	Consumption / sale in kg.				Total in kg.	Total revenue earned Rs. 50/kg
		A	B	C	D		
1.	2011	60	45	40	52	197	9850.00
2.	2012	56	47	43	48	194	9700.00
3.	2013	43	51	38	42	174	8700.00
4.	2014	47	41	47	42	177	8850.00
5.	2015	52	47	36	41	176	8800.00
Average consumption = 184							Average money earned Rs. 9180.00

A-M/s Shankar Ayurvedic Shop.  
B-M/s Harbhookhan Pansari.

C-M/s Vidya Bhoosan Medical Shop.  
D-M/s Kamal Medical Store.



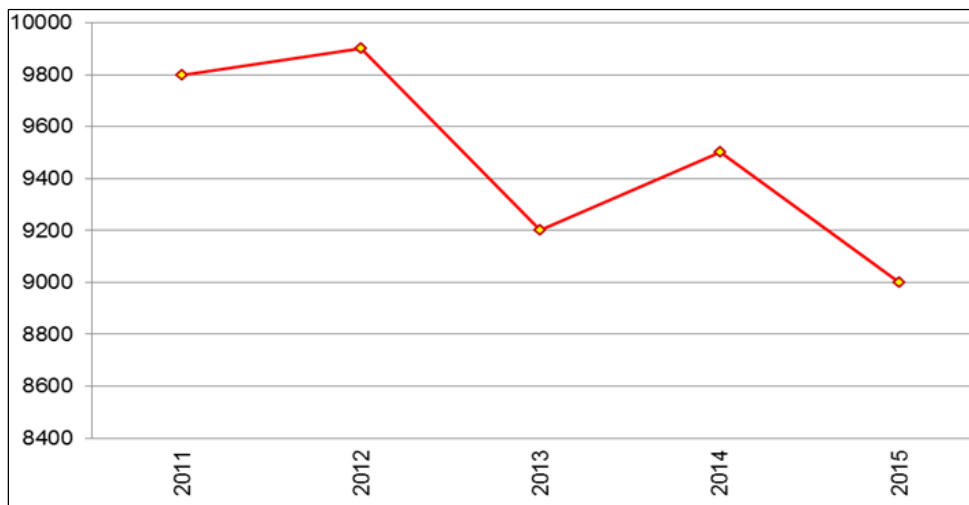
**Fig 1:** Consumption of *Enicostema hyssopifolium* in the last five years in Rewa City

**Table 2:** Consumption and sale of Choorn made from *Enicostema hyssopifolium* in Rewa city.

S. No.	Years	Consumption/sale Rs. 56/100 gms.				Total money and revenue earned
		A	B	C	D	
1.	2011	3000	2200	2000	2600	9800.00
2.	2012	3200	2800	1700	2200	9900.00
3.	2013	2200	2600	2000	2400	9200.00
4.	2014	2800	2600	2000	2100	9500.00
5.	2015	2600	2200	1800	2400	9000.00
Rs. 47400.00						

A-M/s Shankar Ayurvedic Shop.  
B-M/s Harbhookhan Pansari.

C-M/s Vidya Bhoosan Medical Shop.  
D-M/s Kamal Medical Store.



**Fig 2:** Consumption and sale of Choorn made from *Enicostema hyssopifolium* in Rewa city.

**Table 3:** Consumption and sale of Tablet made from *Enicostema hyssopifolium* in Rewa city.

S. No.	Years	Consumption / sale Rs. 33/10 gms.				Total money and revenue earned
		A	B	C	D	
1.	2011	336.00	186.00	290.00	342.00	1154.00
2.	2012	520.00	336.00	340.00	218.00	1414.00
3.	2013	340.00	200.00	515.00	266.00	1321.00
4.	2014	680.00	274.00	666.00	340.00	1960.00
5.	2015	660.00	398.00	340.00	398.00	1796.00
Rs. 7645.00						

A-M/s Shankar Ayurvedic Shop.  
B-M/s Harbhookhan Pansari.

C-M/s Vidya Bhoosan Medical Shop.  
D-M/s Kamal Medical Store

**Table 4:** Consumption and sale of Kadha made from *Enicostema hyssopifolium* in Rewa City.

S. No.	Years	Consumption / sale Rs. 56/100 gms.				Total money and revenue earned
		A	B	C	D	
1.	2011	1410.00	2800.00	1180.00	1960.00	7350.00
2.	2012	1580.00	2440.00	1660.00	1980.00	7660.00
3.	2013	1660.00	2090.00	1360.00	3280.00	8390.00
4.	2014	2380.00	1320.00	2360.00	2780.00	8840.00
5.	2015	1660.00	1960.00	1960.00	2440.00	8020.00
Rs. 40260.00						

A-M/s Shankar Ayurvedic Shop.  
B-M/s Harbhookhan Pansari.

C-M/s Vidya Bhoosan Medical Shop.  
D-M/s Kamal Medical Store.

**4. Conclusion**

Primitive societies have depended on local remedies in illness for ages. All herbal medicines had their origin in folklore even today large population adopt the some methods, at least for initial treatment. Analgesic pills have no doubt reached many corners of the country. Bet there is tremendous possible of popularization of plant based medicine through ethnobotanical approach.

The primitive knowledge of plants is important not just for the tribal people, but for the wider world. The use of plants in folk medicine is very prevalent in Central India (Jain 1962, Jain). Certain plants were considered useful for only one disease whereas several had multiple uses. The *Enicostema hyssopifolium* is used to support healthy digestive cardiovascular and urinary systems. During present investigation it was observed that *Enicostema hyssopifolium* used for various diseases.

Considering the medicinal importance of *Enicostema hyssopifolium* a proper policy should be formulated by the govt. to check its exploitation and supply to Ayurvedic medicine industries and the policy framed should be such that it benefitis the tribals and Weaker sections in sum are the other way.

To conclude finally *Enicostema hyssopifolium* has a great ecological as well as economic significance. The species should be paid specific attention for in farming and management to have better ecological as well as economic in returns.

**5. Acknowledgement**

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