

Herbal Medicine for Market Potential in India: An Overview

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Abstract: People are using herbal medicines from centuries for safety, efficacy, cultural acceptability and lesser side effects. Plant and plant products have utilized with varying success to cure and prevent diseases throughout history. Written records about medicinal plants date back at least 5000 years to the Sumerians and ancient records are suggested earlier use of medicinal plants. Due to side effects of synthetic products, herbal products are gaining popularity in the world market. In spite of well-practiced knowledge of herbal medicine and occurrence of a large number of medicinal plants, the share of India in the global market is not up to the mark. The present article deals with the measures to be adopted for global promotion of Indian herbal products. The scenario and perceptions of herbal medicine are discussed.

Key words: Medicinal plants . Market potential . Herbal industries . Herbal trade

INTRODUCTION









Recently there has been a shift in universal trend from synthetic to herbal medicine, which we can say 'Return to Nature'. Medicinal plants have been known for millennia and are highly esteemed all over the world as a rich source of therapeutic agents for the prevention of diseases and ailments. Nature has bestowed our country with an enormous wealth of medicinal plants; therefore India has often been referred to as the Medicinal Garden of the world. Countries with ancient civilizations such as China, India, South America, Egypt, etc. are still using several plant remedies for various conditions. In this regard India has a unique position in the world, where a number of recognized indigenous system of medicine viz., Ayurveda, Siddha, Unani, Homeopathy, Yoga and Naturopathy are being utilized for the health care of people. No doubts that the herbal drugs are popular among rural and urban community of India. The one reason for the popularity and acceptability is belief that all natural products are safe. The demand for plant based medicines, health products, pharmaceuticals, food supplement, cosmetics etc are increasing in both developing and developed countries, due to the growing recognition that the natural products are non-toxic, have less side effects and easily available at affordable prices [1]. Now a days, there is a revival of interest with herbal-based medicine due to the increasing realization of the health







hazards associated with the indiscriminate use of modern medicine and the herbal drug industries is now very fast growing sector in the international market. But unfortunately, India has not done well in this international trade of herbal industry due to lack of scientific input in herbal drugs. So, it would be appropriate to highlight the market potential of herbal products and that would open floodgate for development of market potential in India [2]. With these objects, we reviewed here the market potential of herbal medicine in India.







INDIAN HERBAL TRADE IN WORLD SCENARIO



The utilization of herbal drugs is on the flow and the market is growing step by step [3]. The annual turnover of the Indian herbal medicinal industry is about Rs. 2,300 crore as against the pharmaceutical industry's turnover of Rs. 14,500 crores with a growth rate of 15 percent [4]. The export of medicinal plants and herbs from India has been quite substantial in the last few years. India is the second largest producer of castor seeds in the world, producing about 1,25,000 tonnes per annum. The major pharmaceuticals exported from India in the recent years are isabgol, opium alkaloids, senna derivatives, vinca extract, cinchona alkaloids, ipecac root alkaloids, solasodine, Diosgenine/16DPA, Menthol, gudmar herb, mehdi

Table 1: List of Medicinal plants whose market potential is very high

S.N.	Name of the plant (Ranunculaceae)	Common name	Figures	Medicinal uses
1.	<i>Aconitum ferox</i> (Ranunculaceae)	Vatsnabh		Cardiac stimulant [18], Anti-rheumatic [19], Anti-inflammatory [19]
2.	<i>Aconitum heterophyllum</i> (Ranunculaceae)	Atis		For curing stomach ache and fever [20], Tonic [21], Febrifuge [21], Anti-cough [21]
3.	<i>Allium sativum</i> (Liliaceae)	Garlic		Anti-hypertensive [18], Anti-hyperlipidemic [22], Platelet aggregation Suppressant [23]
4.	<i>Azadirachta indica</i> (Meliaceae)	Neem		Anthelmintic [18], Astringent [21], Anti-septic [21], Purgative [21], Emollient [21], Anti-plaque [24]
5.	<i>Andrographis paniculata</i> (Acanthaceae)	Kalmegh		Stomachic [18], Hepatoprotective [18], Dyspepsia [18], Anthelmintic [18], Bitter tonic [25], Febrifuge [25]
6.	<i>Asparagus recemosus</i> (Liliaceae)	Satavatri		Galactagogue [25], Diurectic [25], Anti-dysenteric [25], Nervine disorder [26]
7.	<i>Berberis aristata</i> (Berberidaceae)	Daru haridra		Astringent [21], Febrifuge [21], Laxative [21], In menorrhagia [21], In Liver and spleen Diseases [27]
8.	<i>Commiphora weightii</i> (Burseraceae)	Guggul		Hypocholesteremic [21], Hypolipidemic [28] Anti-inflammatiry [5], Anti-rheumatic [5]

9.	<i>Crocus sativus</i> (Iridaceae)	Saffron		Colouring [5] (Food Dye) and Flavouring [5] agent, Anti-spasmodic [5], Stimulant [5], Emmenagogue [29], Anti-tumor [30]
10.	<i>Nardostachys jatamansi</i> (Valerianaceae)	Jatamansi		Diuretic [22], Stomachic [31], In constipation [31], Anti-spasmodic [31], In menstruation [31]
11.	<i>Embelica officinalis</i> (Euphorbiaceae)	Amla		Anti-inflammatory [25], Diuretic [25], Laxative [25], Hepatoprotective [32], Anti-oxidant [33], Anti-fungal [34]
12.	<i>Garcinia camboga</i> (Guttiferae)	Kokum		Anti-obesity [25], Hypolipidemic [35], Anti-fungal [36], Anti-ulcer [37]
13.	<i>Gymnema sylvestre</i> (Asclepiadaceae)	Gudmar		Cardiac stimulant [29], Anti-diabetic [38], Larvicidal [38], Stomach ache [39], Diarrhea [39]
14.	<i>Holarrhena antidysenterica</i> (Apocynaceae)	Kutuja		Amoebicidal [40], Anti-protozoal [40], Anti-tuberculous [40], In facial acne [41]

15.	<i>Ocimum teniflorum</i> (Labiatae)	Holi basil		Aromatic [21], Stimulant [21], Tonic [21], Anti-oxidant [42], Anti-inflammatory [42], Anti-diabetic [43]
16.	<i>Picrorhiza kurroa</i> (Scrophulariaceae)	Kutki		Hepatoprotective [44], Immunomodulatory [46], Anti-inflammatory [45], Jaundice [46], In periodic Fever [46], In Nausea and anorexia [46], Dyspepsia [46], In bronchial asthma [47]
17.	<i>Plantago ovata</i> (Plantaginaceae)	Isabgol		Aphrodisiac [18], Anti-inflammatory [18], Diarrhea [18], Demulcent [21], Laxative [25], Emollient [25]
18.	<i>Saraca indica</i> (Leguminosae)	Ashoka		Gynecologic disorders [27], Uterine tonic [5], Sedative [5], In menorrhagia [5]
19.	<i>Saussurea costus</i> (Asteraceae)	Kuth		Anti-inflammatory [48], Anti-arthritic [48], Cytotoxic [49], Antioxidant [50], Aphrodisiac [51], Carminative [51], Anti-septic [51]
20.	<i>Solanum nigrum</i> (Solanaceae)	Makoy		Sedative [52], Diaphoretic [52], Diuretic [52], Hydragogue [52], Expectorant [52], In dysentery [52], In Piles [53], Fever [53], Hypotensive [53], Antioxidant [53], In stomach ulcer [54], Hepatoprotective [55]

21.	<i>Tinospora cordifolia</i> (Menispermaceae)	Guduchi		Anti-cancer [56], Anti-malarial [57], Anti-periodic [58], Anti-allergic [58], Anti-spasmodic [58], Anti-inflammatory [58], Anti-leprotic [58], Anti-oxidant [58]
22.	<i>Withania somnifera</i> (Solanaceae)	Ashwgandha		Sedative [25], Anti-rheumatic [25], Diuretic [25], Anti-inflammatory [59], Anti-stress [60], Anti-tumor [61], Immunomodulator [5], Rejuvenator [62], Hypotensive [62], Hemopoetic [62]

leaves, papian, rauwolfia guar gum, Jasmine oil, agar wood oil, sandal wood oil, etc [5]. The turnover of herbal medicines in India as over-the-counter products, ethical and classical formulations and home remedies of traditional systems of medicine is about \$ one billion and export of herbal crude extract is about \$ 80 million [3]. The herbal drug market in India is about \$1 billion. Some of the medicinal plants, whose market potential is very high have been identified and summarized in Table 1.

MEDICINAL PLANT BASED INDUSTRIES IN INDIGENOUS SYSTEM OF MEDICINE

In India, It is estimated that there are about 25,000 licensed pharmacy of Indian system of medicine. Presently about 1000 single drugs and about 3000 compound formulations are registered. Herbal industry in India uses about 8000 medicinal plants. Table 2 contains some important manufacturer of herbal formulation [3]. However, none of the pharma has standardized herbal medicines using active compounds as markers linked with confirmation of bioactivity of herbal drugs in experimental animal models [3]. From

Table 2: Manufacturer of herbal formulation

S.N.	Name of the company
1.	Ansar Drug Laboratories, Surat
2.	Acis Laboratories, Kanpur
3.	Amil Pharmaceutical, New Delhi
4.	ALRASIN Marketing, Mumbai
5.	Allen Laboratories, Kolkatta
6.	Bharti Rasanagar, Kolkatta
7.	Dabur India Ltd., Ghaziabad
8.	Dattatraya Krishan Sandu Bros., Mumbai
9.	Herbals Pvt. Ltd., Patna
10.	Herbo-med (P) Ltd., Kolkatta
11.	The Himalaya Drug Co., Banglore
12.	Indian Herb & Research Supply co., Shharanpur
13.	J & J Dechane Laboratories pvt. Ltd., Hyderabad
14.	Madona Pharmaceutical Reaearch Pvt. Ltd., Kolkatta
15.	Kruzer Herbals, New Delhi
16.	Shilpachem, Indore
17.	Hamdard (Wakf) Laboratories, Delhi
18.	Zandu Pharmaceutical Works Ltd., Bombay
19.	Baidyanath Ayurveda Bhavan, Jhansi
20.	Charak Pharmaceuticals, Bombay

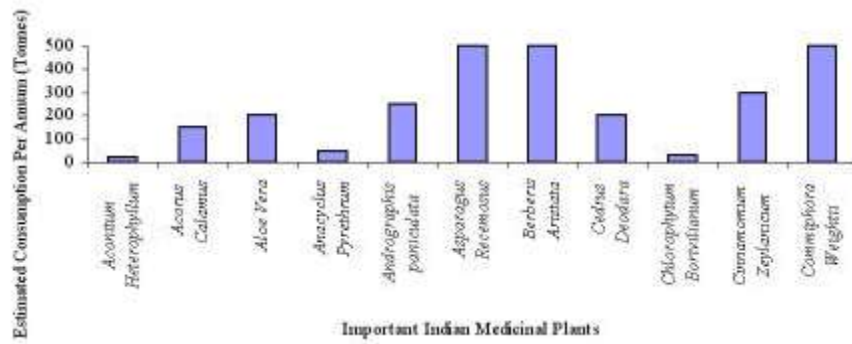


Fig. 1(a): Important indian medicinal plants vs estimated consumption per annum (Tonnes)

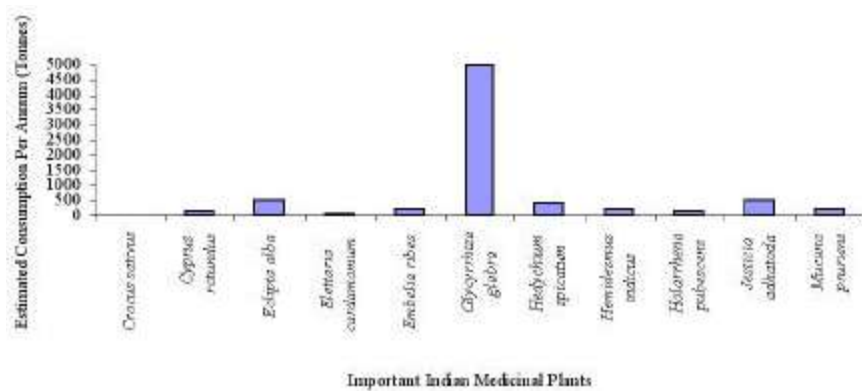


Fig. 1(b): Important indian medicinal plants vs estimated consumption per annum (Tonnes)

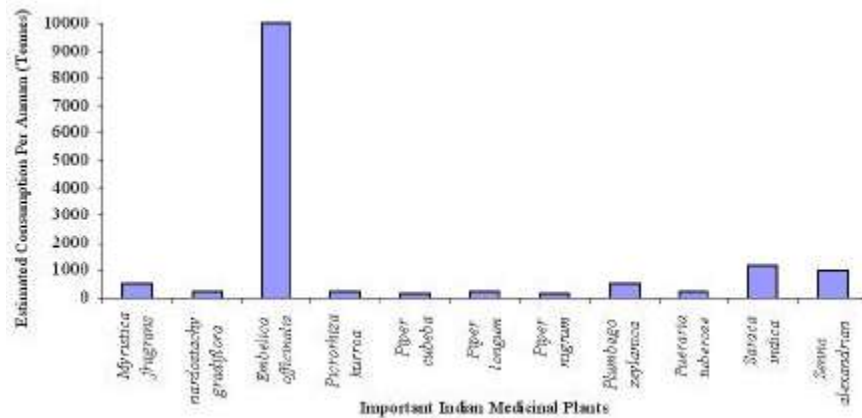


Fig. 1(c): Important indian medicinal plants vs estimated consumption per annum (Tonnes)

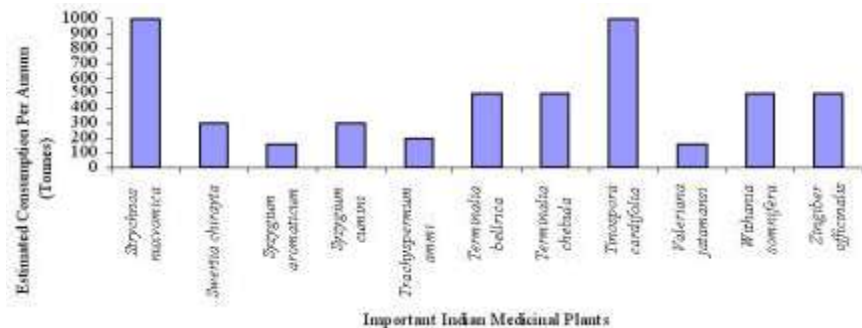


Fig. 1(d): Important indian medicinal plants vs estimated consumption per annum (Tonnes)

about 8000 drug manufactures in India, there are however not more than 25 manufactures that can be classified as large scale manufactures. The annual turnover of Indian herbal industry was estimated around US \$ 300 million in Ayurvedic and Unani medicine was about US \$ 27.7 million. In 1998-1999 again went upto US \$ 31.7 million and in 1999-2000 of the total turnover was US \$ 48.9 million of Ayurvedic and herbal products. Export of herbal drugs in India is around \$ 80 million [7]. Some of the highly consumed medicinal plants are presented in the Table 3 with reference to their turnover [1]. Figure 1(a-d) are the graphical representation of some highly consumed Indian medicinal plants Vs estimated consumption per annum (Tonnes).

WORLD WIDE HERBAL TRADE

The global market for herbal medicines currently stands at over \$60 billion annually. The sale of herbal medicines is expected to get higher at 6.4% an average annual growth rate [8]. Due to the contribution of numerous significant factors, the market of herbal medicines has grown at an expressive rate worldwide. Some of them are: preference of consumers for natural therapies; concern regarding undesirable side effects of modern medicines and the belief that herbal drugs are free from side effects, since millions of people all over the world have been using herbal medicines for thousands of years; great interest in alternative medicines; preference of populations for preventive medicine due to increasing population age; the belief that herbal medicines might be of effective benefit in the treatment of certain diseases where conventional therapies and medicines have proven to be inadequate; tendency towards self-medication; improvement in quality, proof of efficacy and safety of herbal medicines and high cost of synthetic medicines [9].

According to World Health Organization, herbal medicines are lucrative globally and they represent a market value of about US\$ 43 billion a year [10]. According to an estimate in 1991, the herbal medicine market in the European countries was about \$ 6 billion, with Germany accounting for \$ 3 billion, France \$ 1.6 billion and Italy \$ 0.6 billion while in other countries was 0.8 billion. In 1996, the herbal medicine market in the European countries was about \$ 10 billion, in USA about \$ 4 billion, in India about \$ 1.0 billion and in other countries was \$ 5.0 billion [6]. In 1997, the European market alone reached about \$ 7.0 billion. The German market corresponds to about 50% of the European market, about \$ 3.5 billion. This market is followed by France, \$ 1.8 billion; Italy, \$ 700 million;

the United Kingdom, \$ 400 million; Spain, \$300 million; the Netherlands, about \$ 100 million [9].

NEED OF STANDARDIZATION

Every Herbal Formulation must be standardized as per WHO guidelines [11]. The objective of WHO guidelines is to define basic criteria for the evaluation of quality, safety and efficacy of drugs herbal medicines [12]. India is one of the world's twelve leading biodiversity centers with the presence of over 45,000 different plant species, out of this about 15,000-20,000 plants have good medicinal properties of which only about 7,000-7,500 are being used by traditional practitioners. The Siddha system of medicine uses around 600, Ayurveda 700, Unani 700 and modern medicine about 30 plants species. Projection is being made that after information technology, herbal technology will be India's biggest revenue earner [13].

India has a great role to play, as supplier of herbal products not only to meet the domestic needs, but also to take advantage of the tremendous export potential. To be a global supplier of herbal medicines conforming to international specification the following aspects are still demanding the attention:

- Proper botanical identification of all medicinal plants in Indian System of Medicine. All herbal ingredients in preparation to be specified by their botanical names besides their popular/common names.
- Processing of medicinal plants in a scientific, economic and safe way using similar ones used for modern drugs.
- Isolation and chemical characterization of acute ingredients including inorganic constituents, wherever possible.
- Pharmacological and clinical studies to ascertain their efficacy and safety.
- Standardization to ensure uniformity. The use of medicinal plants in combination to be limited to facilitate analysis and to apply quality control and standardization parameters to herbal drug preparations.
- Documentation of research.

Such scientifically aspects will project herbal medicine in a proper perspective and help in sustained global market [14]. An estimate of WHO demonstrates about 80% of world population depends on natural products for their health care, because of side effects and high cost of modern medicine [2]. World Health Organization currently recommends and encourages

Table 3: Important plants with reference to trade

S.N.	Plant name	Common name	Plant part	Estimated consumption (Tones)
1.	<i>Aconitum heterophyllum</i>	Atis	Root	20
2.	<i>Acorus calamus</i>	Vacha	Rhizome	150
3.	<i>Aloe vera</i>	Aloes	Leaf	200
4.	<i>Anacyclus pyrethrum</i>	Akkarkara	Fruit	50
5.	<i>Andrographis paniculata</i>	Kalmegh	Aerial part	250
6.	<i>Asparagus recemosus</i>	Satavatri	Root	500
7.	<i>Berberis Aristata</i>	Daru haldi	Root	500
8.	<i>Cedrus deodara</i>	Deodar	Heart Wood	200
9.	<i>Chlorophytum borivilianum</i>	Safed musli	Root	25
10.	<i>Cinnamomum zeylanicum</i>	Dalchini	Bark	200-300
11.	<i>Commiphora wrightii</i>	Guggul	Gum resin	500
12.	<i>Crocus sativus</i>	Keasr	Stigma	5
13.	<i>Cyprus rotundus</i>	Nagar motha	Rhizome	150
14.	<i>Eclipta alba</i>	Bhringraj	Aerial part	500
15.	<i>Elettaria cardamomum</i>	CAedamon	Seed	60
16.	<i>Embelia ribes burm</i>	Vidanga	Fruit	200
17.	<i>Glycyrrhiza glabra</i>	Milathi	Root	5000
18.	<i>Hedychium spicatum</i>	Kapurkachri	Rhizome	400
19.	<i>Hemidesmus indicus</i>	Anantmoool	Root	200
20.	<i>Holarrhena pubescens</i>	Kurchi	Bark	150
21.	<i>Justicia adhatoda</i>	Vasaka	Leaf	500
22.	<i>Mucuna pruriens</i>	Kaunch beej	Seed	200
23.	<i>Myristica fragrans</i>	Jaiphal	Fruit	500
24.	<i>Nardostachy gradiflora</i>	Jatamansi	Root	200
25.	<i>Embelica officinalis</i>	Amla	Fruit	10000
26.	<i>Picrorhiza kurroa</i>	Kutki	Root	200
27.	<i>Piper cubeba</i>	Cubeb	Fruit	150
28.	<i>Piper longum</i>	Pipramul	Fruit	200
29.	<i>Piper nigrum</i>	Black pepper	Fruit	150
30.	<i>Plumbago zeylanica</i>	Chitrak	Root	500
31.	<i>Pueraria tuberosa</i>	Vidarikanda	Root	200
32.	<i>Saraca indica</i>	Ashoka	Bark	1200
33.	<i>Senna Alexandrian</i>	Senna	Leaf & pod	1000
34.	<i>Strychnos nux vomica</i>	Luchia	Seed	1000
35.	<i>Swertia chirayta</i>	Chirayita	Whole plant	300
36.	<i>Syzygium aromaticum</i>	Clove	Flower bud	150
37.	<i>Syzygium cumini</i>	Jaman beej	Seed	300
38.	<i>Trachyspermum ammi</i>	Ajwain	Fruit	200
39.	<i>Terminalia bellrica</i>	Bahera	Fruit	500
40.	<i>Terminalia chebula</i>	Harar	Fruit	500
41.	<i>Tinospora cardifolia</i>	Guduchi	Stem	1000
42.	<i>Valeriana jatamansi</i>	Tagar	Root & Rhizome	150
43.	<i>Withania somnifera</i>	Ashwgandha	Root	500
44.	<i>Zingiber officinalis</i>	Ginger	Rhizome	500

traditional herbal remedies in natural health care programs because these drugs are easily available at low cost and are comparatively safe. People's faith in such remedies is reflected by a whooping turnover of 450 Crores annually in herbal market

besides a healthy 11% annual growth rate and the increasing export potential has attracted several large and medium scale pharmaceutical industries and even multinationals to jump on to the band wagon [14].

DEVELOPMENT IN HERBAL MEDICINE INDUSTRY WITH REFERENCE TO TRADE

There is great demand for herbal medicine in the developed as well as developing countries like India, because of their wide biological activities, higher safety of margin than the synthetic drugs and lesser costs [15]. Medicinal plants play a great role in food supplements for care as well as in personal care of the mankind alongside the therapeutically active substances, thus medicinal plant based industry is a promising sector and enormous economic growth potential. Nutraceuticals (Health Food) are in great demand in the developed world particularly USA and Japan. Nutraceutical market in USA alone is about \$ 80-250 billion, with a similar market size in Europe and Japanese sales worth \$ 1.5 billion [5]. Such huge markets have arisen because of the Dietary Supplement Health Education Act passed by USA in 1994, which permits unprecedented claims to be made about food or the dietary supplement's ability about health benefits including prevention and treatment of diseases. This act has motivated pharma to include not only compounds isolated from fauna and flora but also herbal medicines as Nutraceuticals, which is unfortunate. The Indian herbal pharma companies also see this as a good opportunity and are marketing such products [3].

However, the importance of medicinal plants in the national economy and their potential for the rapid growth of herbal products, perfumery and allied industry in India has been emphasized from time to time [5]. New trends are emerging in the standardization of herbal raw materials whereby it is carried out to reflect the total content of phytoconstituents like polyphenols, which can be correlated with biological activity [16]. The major traditional sector pharmas, namely Himalaya, Zandu, Dabur, Hamdard, Maharishi, etc, are Standardizing their herbal Formulations by Chromatography techniques like TLC/ HPTLC finger printing, etc [17].

CONCLUSION

India is sitting on a gold mine of well-recorded and well-practiced knowledge of traditional herbal medicine. The basic requirements for gaining entry into developed countries include well-documented traditional use, Single-plant medicines, Medicinal plants free from pesticides, heavy metals etc., Standardization based on chemical and activity profile and Safety and stability. Herbal drug development is possible only through the development of standardized herbal products. The health care systems are going to

become more and more expensive therefore, we have to develop technologies to essentially introduce and integrate herbal medicine system in our health care. There is an enormous scope for India also to emerge as a major player in the global herbal product based medicine. Let us hope that drug manufactured in accordance with principles of Ayurveda, Siddha and Unani will reach new horizons and make them the best in the world if the quality of the herbal drugs is maintained, efficacy would it self be maintained and then there is nothing to stop them from competing with the modern medicine with added advantages of fewer side effects and lower costs.

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