Journal of Agriculture and Natural Resources (2024) 7(1): 37-49
ISSN: 2661-6270 (Print), ISSN: 2661-6289 (Online)
DOI: https://doi.org/10.3126/janr.v7i1.73123

Research Article

Assessment of end products of Ashwagandha (*Withania somnifera)* and their marketing channel in Bharatpur, Chitwan, Nepal

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Received: August 15, 2024; Revised: October 30, 2024;
Accepted: December 05, 2024; Published: December 30, 2024

ABSTRACT

This study was conducted for six month from February-July in 2019 to evaluate the end products, end uses, ingredients and marketing channel associated with Ashwagandha (*Withania somnifera*) in Bharatpur, Chitwan, Nepal. A 100% sampling intensity was employed encompassing all medicinal/herbal retailer shops and processing industries/companies identified within the study area. Data were collected through complete surveys of herbal/medicinal shops and industries located at Bharatpur city by using structured questionnaire which offered 41 end products containing *W. somnifera* as an ingredient. Additionally, two herbal industries were found, producing six types of Ayurvedic medicines using *W. somnifera* as a key ingredient. The major uses of these Ayurvedic medicines were found to treat illness of physical weakness (n=20), nervous system (n=18) and reproductive system (17). Of total end products 31.7% were solely made only from Ashwagandha and remaining were prepared by using other 187 medicinal plants/minerals or its extract as ingredient out of which Kurilo (*Asparagus racemosus*) was the most used medicinal plant as ingredient with it. Most of products were Classical Ayurvedic Medicine (51.22%) and sold without prescription (65.85%) also. Most of them were manufactured within Nepal (75.61%) but depends on Indian market for raw material of Ashwagandha. These products from manufacturing industries reached to medicinal/herbal retailer shops through stockiest and super stockiest and sometimes directly from Nepalese company via courier and marketing agents. Major challenges of *W. somnifera* processing industries is lack of cultivation of this species in Nepal leading their dependency on India for raw material, lack of incentives, difficult bureaucracy and political instability.

Keywords: *Withania somnifera*, Medicinal Plants, Ayurvedic Medicines, Nepal

Correct citation: K. C. Binita, and Kafle, G. (2024). Assessment of end products of Ashwagandha (*Withania somnifera*) and their marketing channel in Bharatpur, Chitwan, Nepal. *Journal of Agriculture and Natural Resources, 7*(1), 37-49.
DOI: https://doi.org/10.3126/janr.v7i1.73123

INTRODUCTION

Ashwagandha (*Withania somnifera)* is an erect, evergreen (green in whole year), branching, tomentose shrub of Solanaceae family having 30 to 150 cm height (Mirjalili *et al.*, 2009). It is a xerophytic plant that is found mostly in the drier parts of India, Srilanka, Afghanistan, Baluchistan and Sind, but it is also distributed in the Mediterranean regions, the Canary Islands of Spain and Cape of Good Hope in South Africa (Uddin *et al.*, 2012). The raw material used in medicine is the root, and the name "Ashwagandha" is derived from the word "ashwa", meaning horse. It is believed that after consuming the root, one gains powers

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similar to that of a horse. The second part of the name "gandha," means fragrance and refers to the characteristic smell of the fresh root of the plant (Singh *et al.,* 2011). Being a drought hardy crop, it requires dry climate for better development and winter low temperatures are known to increase the root quality and yield (Kahar *et al.,* 1991). The crop starts flowering and fruiting from December and harvested in January-March at 150 to 180 days after sowing. The maturity of crop is judged by drying out of leaves and yellow red berries. Approximately 0.5-0.7 tonnes of dried roots and 50-76 kg seeds can be obtained from one hectare area under commercial cultivation and market price of dry root is Rs4000 per kg (Kubsad *et al.,* 2010; Rajeswara *et al.,* 2012). It is a highly important medicinal plant and used globally in the pharmaceutical industry (Baba *et al.,* 2013). As the world's largest producer, India exports Ashwagandha in a variety of forms, including raw (dried leaves, dried roots), root powder, extracts, capsules, tablets, formulations, and other forms to nations like Romania, Bulgaria, Italy, the United States of America, South Africa, Belgium, Canada, and the Czech Republic (Khabiya *et al.,* 2024). The multinational company, Dabur Nepal, has also prioritized *Withania somnifera* for commercial cultivation in low altitude (Bara, parsa) mainly for use in its factory located in Nepal and India (Barakoti *et. al*, 2013). *W. somnifera* is used as dietary supplement and the decoction of its root is used as nutrient and health restorative to pregnant and old people. The root of Ashwagandha can be used as tonic, aphrodisiac, narcotic, diuretic, anthelmintic, astringent, thermogenic and stimulant. It is also used in emaciation of children (when given with milk, it is the best tonic for children), debility from old age, rheumatism, vitiated conditions of vata, leucoderma, constipation, insomnia, nervous breakdown, goiter etc. (Sharma, 1999). The leaves are bitter and are recommended in fever, painful swellings and the flowers are used as astringent, depurative, diuretic and aphrodisiac. The seeds are anthelmintic and in combination with astringent and rock salt it helps to remove white spots from the cornea (Sharma, 1938).

Herbal products have become an important and indispensable part of public healthcare around the world (Lai, 2001). People interest in natural therapies, namely herbal medicines has increased dramatically not only in developing countries but also in developed nations (Calixto, 2000). Allopathic medicine may cure a wide range of diseases; however, its high prices and side-effects are causing many people to return to herbal medicines which have fewer side effects (Kala, 2005). The demand for medicinal plant (MPs)-based raw materials is growing at the rate of 15 to 25% annually, and according to an estimate of WHO, the demand for medicinal plant is likely to increase more than US $5 trillion in 2050 (Sharma, 2004). 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 (Inamdar, 2008). In India, the estimated annual production of Aswagandha roots is more than 1500 t, while the annual requirement is about 7000 t, so that increased cultivation and higher production have become necessity (Umadevi *et al.,* 2012).

Recognizing the present escalating demand for herbal medicines, and also in order to reduce the possibility of bio-piracy and to protect the rights of traditional herbal healers, there is an urgent need to document the various uses of plant species (Udgaonkar, 2002). The aim of this study is to contribute to the understanding of commercially important medicinal plants by exploring the end products, end uses and marketing channel of end products using Ashwagandha in Nepal. Likewise, the study focuses on ingredients used in the end products of Ashwagandha that helps to document and evaluate the ingredients and provides the knowledge on most commonly used ingredient with Ashwagandha for making herbal medicine. Since very few works have been done on this topic, this study will be useful to provide baseline information in further studies. There is a possibility of developing this plant

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a source of antifungal agent and further investigations are necessary to identify the bioactive principles (singh *et al.*, 2010). However, in India cultivation and bussiness of Ashwagandha faces challenges like market exploitation, price and demand fluctuations, limited exports, climate change, low yields, pests, labor issues, patenting, storage problems, and post-harvest knowledge gaps (Rajeswara *et al.*, 2012). National Medicinal Plants Board (NMPB) in India is promoting *W. somnifera* species for large scale cultivation and the multinational company, Dabur Nepal, has also prioritized this species for commercial cultivation mainly for use in its factory located in Nepal and India (Paroda *et al.*, 2013). Understanding end products of Ashwagandha is essential for the prediction of future demand for this species and planning for its sustainable harvesting and cultivation as Ashwagandha is not native in Nepal but have great opportunity for the commercial cultivation. However, we do not have much information on end-products, end uses and marketing channel of Ashwagandha in Nepal. In this context, this study was carried out in Bharatpur, Chitwan to assess end products of *Withania somnifera* and their marketing channel.

METHODOLOGY

Study site

The study was conducted in Chitwan's Bharatpur in Latitude: 84.4173° E, 27.6487° N. Its area is 167 square miles (432.95 km^2) and population is 369,377 Population (Census 2021). The climate is tropical, with humid and hot summers and mild winters. The elevation is 208 meters (682 feet). The Brahmin, Chhetri, Tharu, Newar, Gurung, Magar, Tamang, and Chepang are the main ethnic groups. The map of study site is given in Figure 1.

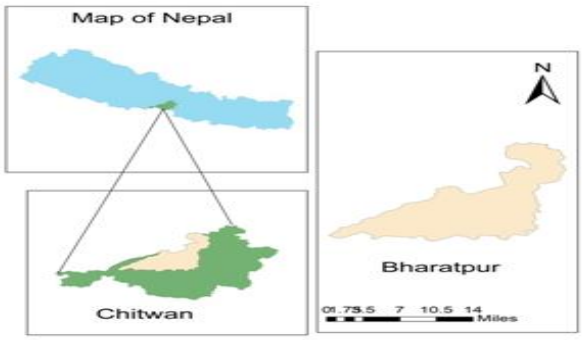

Figure 1: Map of study site

Data Collection

Market survey:

All herbal/medicinal retailer shops (n=15) located at Bharatpur, Chitwan were surveyed to identify the herbal products which has Ashwagandha as ingredient by using structured questionnaire which was composed of introduction, name of end-product containing *W. somnifera*, form of product, manufacturers' details, who mainly buys, basis of sale (prescription or without prescription), use of product, amount of *W. somnifera* used, ingredients used and retail price as well as its marketing channel. The amount of *W. somnifera* used and other ingredients of end products was observed and recorded by reading the labels of end products containing *W. somnifera.*

Industrial survey:

Face to face interview was conducted by using structured questionnaire with the representatives of all companies (n=2) established at the study area which are manufacturing end products using *W. somnifera* as an ingredient. The structured questionnaire was

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composed of three major sections. Section 1 included characteristics of respondents such as name, age, education and number of years of experiences in processing of medicinal plants. Section 2 included characteristics of the industry such as name, year of establishment, and number of regular staffs. Section 3 included name of end-product or end product containing *W. somnifera*, amount of its raw dry roots required, price of raw material (dry roots), and marketing channel of end-products and challenges they face. The information on end-products collected from market survey was also cross-checked and confirmed with this survey.

Data analysis

The data collected from both primary and secondary sources were analyzed using both qualitative and quantitative methods depending on the nature of the field data and were interpreted through statistical tools. The descriptive (frequency and percentage) statistics were used to analyze the qualitative data. Microsoft excel 2010 software was used to analyze the quantitative data.

RESULTS AND DISCUSSION

End products of *W. somnifera*:

There were no any records about the end products manufactured from the *W. somnifera* found in our country. From market and industrial survey, we found that *W. somnifera* was used as an ingredient in 41 medicines available at 15 herbal/medicinal retailer shops of Bharatpur (Table 1). All of these medicines were Ayurvedic medicine. Among these medicines, 21(51.22%) were classical (Classical Ayurvedic medicine which is prepared considering different standard formulation from traditional Ayurvedic text books like Charaka Samhita, Sushruta Samhita etc. those preparations remain the same for specific medicine irrespective of the manufacturers) and remaining 20 (48.78%) were proprietary (Ayurvedic Medicine) which is prepared by industries using their own formulations. The forms of these Ayurvedic medicines were different: 18 were in powder form, 10 were in capsule form, 9 were in syrup form, 3 were in tablet and 1 was in gel form. *W. somnifera* are mostly used and sold as dietary supplements in the form of powder, syrup, tablets, and capsules (Chandra *et al*., 2016).

Medicines were sold either on demand of the consumer or on the prescription by physician. From market survey, it was found that about 34.15% of Ayurvedic medicines were sold only on prescription by physician and 65.85% can be sold without prescription on demand of consumer. Most of the Ayurvedic medicines are sold on demand of consumers without the prescription of registered physicians and only some of them are consumed on prescription of the physician (Adhikari, 2009). Both Indian and Nepalese industries were processing *W. somnifera* for making different kinds of medicine for different end uses. Out of total Ayurvedic medicine, ten (24.39%) products were manufactured by Indian company and 31(75.61%) were manufactured within country. According to Adhikari and Regmi (2009), Indian and Nepali manufacturers were found about equal in number, the frequency of Indian medicines was found quiet high in Nepalese market. From this study, it was found that Nepalese products are expanding and replacing the Indian products in Nepalese market. The number of herbal medicine processing units has increased by 80% in the past eight years since 2015 (Chapagain *et al.*, 2024).

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Table 1: Details of end products containing *W. somnifera* (N=41)

SN	Name of product	Form of product	Category of product	Marketing channel	Use of end products	Amount of *W. somnifera* used	Name of manufacturing industry
1	*Ashwagandha Churna* (UHU)	Powder	CAM	Direct	Aphrodiasic, Insomnia, Weakness	100%	Upadesh Herbal Udhyog, Chitwan.
2	*Pradar Bishek Churna* (UHU)	Powder	CAM	Direct	Dysmenorrhoea, Pradar	4%	Upadesh Herbal Udhyog, Chitwan.
3	Ashwagandha (GACPL)	Capsule	CAM	Direct	General debility, Emaciation, Insomnia and promotion of general promotion	100%	Gorkha Ayurved Co. Pvt. Ltd., Kathmandu.
4	Ashwagandha powder(GHPL)	Powder	CAM	Direct	General debility, and weakness	100%	Gorakhnath Herbaceuticals Pvt. Ltd., Kabre.
5	Tensarin (GACPL)	Tablets	PAM	Direct	Hypertension, anxiety, depression and forgetfulness	10%	Gorkha Ayurved Co. Pvt. Ltd., Kathmandu.
6	Narvinol (HPL, India)	Capsule	PAM	Super stockiest via courier (Biratnagar)	Keep mind sharp and stress free	8%	Herbals (APs) Pvt. Ltd., India.
7	*Zandu Ashwagandha rishta*	Liquid	CAM	Super stockiest (Birjung)	General debility	14.39%	Emami Limited, Kolkata.
8	*Ashwagandha churna* (SHC)	Powder	CAM	Direct	General debility, Physical and mental stress	100%	Solution Herbal Company Pvt. Ltd., Dhading.
9	Ashwagandha (BHPL)	Capsule	CAM	Stockiest (Bishwo)	Physical, mental and nervous strength	100%	Bhaskar Herbaceuticals Pvt. Ltd., Birjung.
10	Ayuvigo (WLPL)	Capsule	PAM	Superstockiest, Butwal	General weakness, stress, Sexual debility, Reproductive health	16.67%	Welex Laboratories Pvt. Ltd., India.
11	*Yarshajeet capsule* (SHC)	Capsule	PAM	Direct	Increase libido and arousal level, sexual stimulant	10%	Solution Herbal Company Pvt. Ltd., Dhading.
12	*Musli Pak* (Shree Baidyanath, India)	Powder	CAM	Stockiest (Dhanwantari, Bharatpur)	Strength, Vigour and Emaciation	0.4%	Shree Baidyanath, India
13	*Ashwagandha Churna* (AJU)	Powder	CAM	Direct	Sexual debility, premature ejaculation and weakness	100%	Anmol Jadibuti Udhyog, Lalitpur.
14	*Anmol Pidha Nasak Churna* (AJU)	Powder	CAM	Direct	Gout, Osteo-arthritis, Back ache, Body ache, lumbar, Spondylosis, Frozen shoulder and Sprains and painful joints	15%	Anmol Jadibuti Udhyog, Lalitpur.
15	*Anmol Bruhat Vata Nivarak*	Powder	CAM	Direct	Rheumatism, Fatique,	5%	Anmol Jadibuti

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SN	Name of product	Form of product	Category of product	Marketing channel	Use of end products	Amount of *W. somnifera* used	Name of manufacturing industry
	Churna (AJU)				Muscular ache, Joint pain, Anthritice, Body ache		Udhyog, Lalitpur.
16	*Tri-shakti Churna* (AJU)	Powder	CAM	Direct	Increasing Blood power, Sexual disability, Premature ejaculation, Nocturnal emissions, stress and weakness	30%	Anmol Jadibuti Udhyog, Lalitpur.
17	*Ashwagandha Churna* (GACPL)	Powder	CAM	Stockiest	General debility, Emaciation and Insomnia	100%	Gorkha Ayurved Co. Pvt. Ltd., Kathmandu.
18	*Ashwagandha Churna* (ABWPL)	Powder	CAM	Stockiest	General debility, Aphrodisiac and Rejuvenation	100%	Arogya Bhawan Works Pvt. Ltd., Kathmandu.
19	*Satavaryadi Churna* (SaAAU)	Powder	CAM	Direct	Erectile dysfunction, loss of libido and disorder of semen	20%	Sagarmatha Ayurvedic Aausadi Udhyog, Kathmandu.
20	*Ashwagandha churna* (SwAAU)	Powder	CAM	Direct	Aphrodisiac, Insomnia and Weakness	100%	Swargadwari Ayurvedic Aausadi Udhyog, Chitwan.
21	*Shakti Kalpa* (SwAAU)	Powder	PAM	Direct	Sexual debility and Libido	10%	Swargadwari Ayurvedic Aausadi Udhyog, Chitwan
22	Semento (AIMIL pharmaceutical, India)	Tablet	PAM	Stockiest, Bharatpur	Promotes and tones male system in nature's way	7.84%	AIMIL Pharmaceutical, India
23	Memoplus (Grace pharmaceuticals pvt. Ltd.)	Liquid	PAM	Stockiest (sriyam supplier, Bharatpur)	Memory tonic	6.93%	Grace Pharmaceuticals Pvt. Ltd., Rupendehi.
24	Lactone	Syrup	PAM	Stockiest Bharatpur	Lactogenic nutritive for female	14.7%	Ojas Herbaceuticals Private Limited, Kapilvastu, Nepal
25	Aptiboom	Syrup	PAM	Stockiest (sriyam supplier, Bharatpur)	Apetite, Digestive system	19.23%	Grace Pharmaceuticals Private limited, Rupendehi, Nepal
26	Superactive	Syrup	PAM	Stockiest (sriyam supplier, Bharatpur)	Energy and tonic	2.88%	Grace Pharmaceuticals Private Limited, Rupendehi, Nepal
27	Vigo Power	Powder	PAM	Direct	Sexual debility, and libido	20%	Swargadwari Ayurvedic Aausadi Udhyog
28	B-ALL	Syrup	PAM	Stockiest	As vitamin	11.42%	Grace

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SN	Name of product	Form of product	Category of product	Marketing channel	Use of end products	Amount of *W. somnifera* used	Name of manufacturing industry
				(sriyam supplier, Bharatpur)	(physical weakness)		Pharmaceuticals Private limited, Rupendehi, Nepal
29	Stresscom	Capsule	PAM	Superstockiest (Luna trading company, Birjung)	Physical and mental weakness, General debility	100%	Dabur India, India
30	Ashwagandha Capsule	Capsule	PAM	Direct	Physical and mental weakness, General debility	100%	Siddha Formulation Pvt. Ltd., Rupendehi, Nepal
31	Nervitone	Syrup	PAM	Direct	Improves mental alertness and memory, useful in anxiety and stress	8.93%	Bhaskar Herbaceutical Pvt. Ltd., Birjung, Nepal
32	Vita-Ex Gold	Capsule	PAM	Superstockiest	For stronger and sustained stamina and vitality	3.77%	Shree Baidyanath Ayurvedic Bhawan Pvt. Ltd., India
33	*Ashwagandha rishta*	Syrup	CAM	Superstockiest	Physical and mental stress, tonic	91.68%	Shree Baidyanath Ayurvedic Bhawan Pvt. Ltd., India
34	Live-vita	Syrup	PAM	Stockiest	Malnutrition, Iron deficiency anemia, general debility, vitamin and mineral deficiency	14.87%	Live Pharmaceuticals Pvt. Ltd., Rupendehi
35	Vigoril	Capsule	PAM	Superstockiest	Sex stimulant	6.67%	Growel Pharmaceuticals, India
36	*Ashwagandha Churna*	Powder	CAM	Direct	Mental stress and Nerve disease	100%	Jiban Shakti Ayurvedic Aausadhi Udhyog, Hetauda, Nepal
37	*Dabur Chyawanprash*	Gel	CAM	Stockiest (Raj ayurved, Bharatpur)	Strength	0.796%	Dabur Nepal, Bara, Nepal
38	Revival Capsule	Capsule	PAM	Stockiest (Bishwo)		7.77%	Dharmani International, India
39	Stressnil	Tablet	PAM	Stockiest (Bishwo)	Anxiety, Depression and stress	47.05%	Grace Pharmaceuticals Private limited, Rupendehi, Nepal
40	*Ashwagandha Churna*	Powder	CAM	Stockiest (Bishwo)	Stress, Fatique and Weakness	100%	Dekha Herbaceuticals Pvt. Ltd., Lalitpur, Nepal
41	*Saraswata Churna*	Powder	CAM	Direct	Unmada, Apasmara and Smritikshya	9.09%	Upadesh Herbal Udhyog

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Uses of End products of *W. somnifera*:

The major uses of the Ayurvedic medicines containing *W. somnifera* has been categorized into a number of illness categories: Nervous system disorder, Reproductive system disorder, Physical weakness, Digestive system, Rheumatism and many others. Table 2 showed that the highest number of products (n=20, 48.78%) were reported to treat disease associated with nervous system disorder. About 17 (41.46%) of Ayurvedic medicine were found to treat the disease associated with reproductive system disorder etc. Sixteen (n=16, 39.02%) Ayurvedic medicines containing *W. somnifera* were used to treat the physical weakness. A few number of Ayurvedic medicine (n=2), were found to treat the disease related to rheumatism and one for disorder related to digestive system. *W. somnifera* in India is widely used for improving reproductive power (Połumackanycz *et al.*, 2020) and nervous system (Mikulska *et al.*, 2023), rejuvenating body, improving vitality and recovery after chronic illness (Singh *et al.*, 2010).

Table 2: **Uses of End products of *W. somnifera* (N=41)**

Uses	Frequency	Percentage
Nervous system disorder	20	48.78
Reproductive system disorder	17	41.46
Physical weakness	16	39.02
Rheumatism	2	4.88
Digestive system disorder	1	1.44
Other	2	2.88

Ingredients used in medicine containing *W. somnifera*

W. somnifera was used either as single herb or as an ingredient of polyherbal or herbo-mineral formulations for the making herbal medicine. Among 41 end products using *W. somnifera* that were available in Bharatpur city, 13(31.7%) end products were manufactured using *W. somnifera* only and other 28(68.29%) end products were manufactured using *W. somnifera* as ingredient with other species. *W. somnifera* may be effective not only in isolation, but may actually have a potentiating effect when given in combination with other herbs or drugs (17) (Figure 2). Altogether 187 ingredients (medicinal plants) were used with *W. somnifera* in the forty one Ayurvedic medicine. Thirteen medicine were manufactured only from the *W. somnifera*. Among 187 ingredients except *W. somnifera*, 172 were medicinal plants and 10 were Ayurvedic medicine prepared using mineral extract and 5 were minerals only. Highest used ingredient was *Asparagus racemosus* which was used in 17 Ayurvedic medicines.

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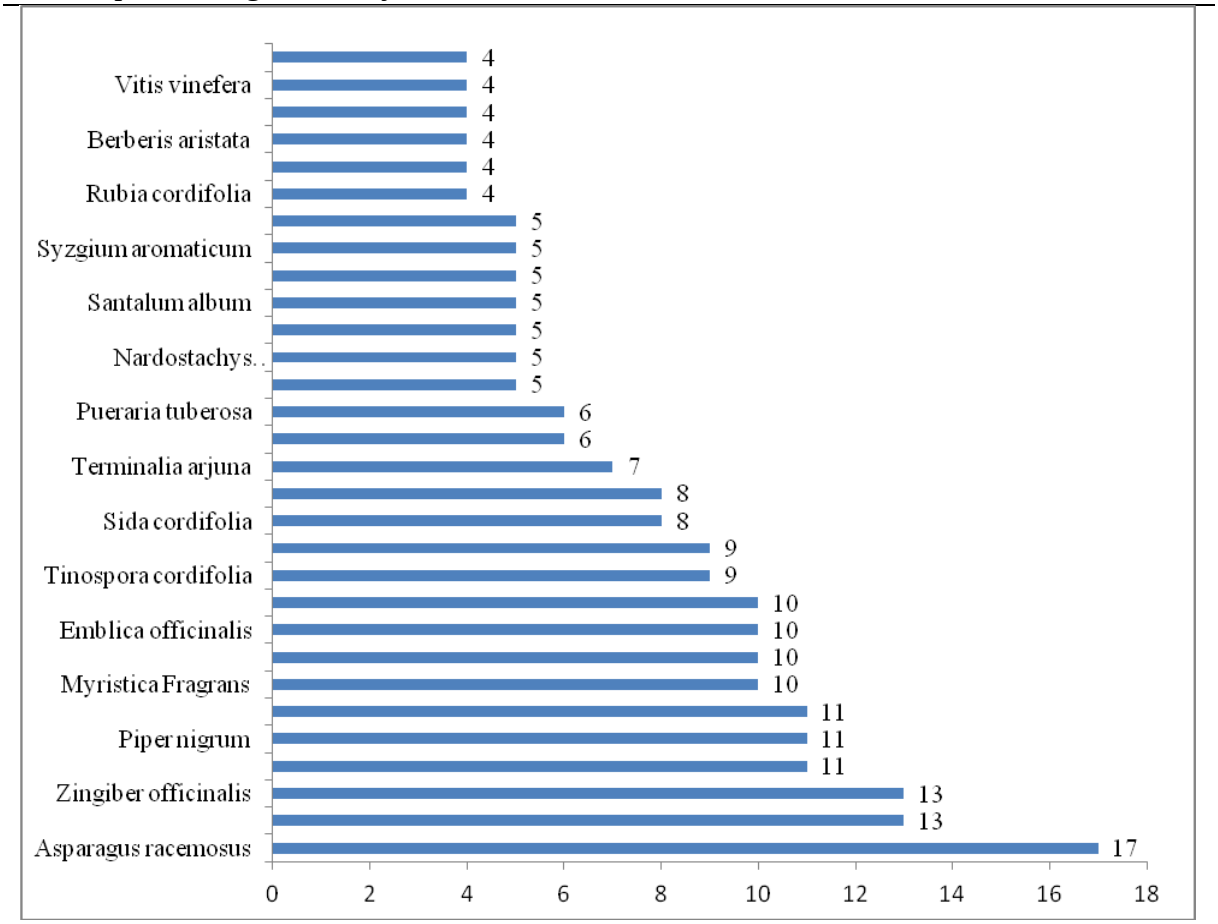

Figure 2: List of mostly used ingredients along with their availability in Ayurvedic medicine

Table 3: List of Ayurvedic medicine prepared from mineral extract used as ingredients in end products of Ashwagandha

SN	Ayurvedic medicine	Mineral used
1	Makardwaj	Mercury
2	Yarshad Bhasma	Zinc
3	Kant lauch bhasma	Iron
4	Swarna bhasma	Gold
5	Vang Bhasma	Tin
6	Swarna Makshik Bhasma	Copper and iron
7	Abhrak Bhasma	Mica
8	Ras sindoor	Mercury
9	Godanti Bhasma	Gypsum
10	Mandur Bhasma	Iron rust

Table 4: List of minerals used as ingredients in the end products of Ashwagandha

SN	Minerals
1	Purified black bitumen
2	Arsenii trisulphide
3	Ferrum
4	Saindhava lavana
5	Vida lavana

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Domestic demand of dry roots of W. somnifera in the industries of Bharatpur, Chitwan:
The domestic industrial demand for *W. somnifera* in Nepal was unknown for a long time. Table 3 showed that the annual demand for dry roots of *W. somnifera* in Ashwagandha-processing industries (n=2) in Bharatpur in 2018 was 1500kg (1.5 tons). All the raw materials were imported through different trader from India. We compared our findings with that of Kathmandu valley where the annual domestic consumption of *W. somnifera* was 4035 kg which was totally imported from India only (Tiwari *et al.*, 2004).

Table 5: Characteristics of *Withania somnifera* processing industries and annual consumption of *W. Somnifera* in Bharatpur, Chitwan

SN	Name of industry	Date of Establishment (B.S)	Name of End products	Annual consumption of dry roots (kg/yr)	Total consumption (kg/yr)
1	Upadesh Herbal Udhyog	2064	Ashwagandha churna	500	850
			Pradar bisek churna	200	
			Saraswata churna	150	
2	Swargadwari Ayurvedic Aausadhi Udhyog	2065	Ashwagandha churna	500	650
			Sakti kalpa	100	
			Vigo power	50	
	Total				1500

Marketing channel of End products of W. somnifera*:*
There is little and scattered information on the medicinal plant processing enterprises of Nepal which makes it time-consuming for interested parties to locate and contact enterprises for study or business purposes (Shrestha *et al.*, 2020). All the respondents of medicinal retailer shops reported that they didn't have problems for getting the Ayurvedic medicine. They got their medicine by making contact with stockiest (a retailer that stocks goods of a particular type for sale from Nepalese company only) and super stockiest (a retailer that stocks goods of a particular type for selling from international company). In some cases, the retailer also made direct contact with the company or industries. For Indian Ayurvedic medicine, retailers in Bharatpur city made contact with the super stockiest who stocks medicine from India only. Different industries had contact with different super stockiest in Nepal who supply products to different stockiest all over Nepal and sometimes directly to the herbal/medicinal retailer shop also. They received their order via courier and marketing representatives (Figure 3). These medicines are then reach to main users/consumer with/or without prescription. The use of traditional herbal remedies for self-medication has become very common among Nepalese individuals (Shrestha *et al.*, 2020). The major challenge manufacturing company in Bharatpur is facing is there is no scientific cultivation of Ashwagandha in Nepal and they have to depend completely on India for raw material and negligence of Nepal government to promote domestic medicinal plant processing enterprises, unstable instability and difficult bureaucracy. According to Caporale *et al.*, 2020, key obstacle for such enterprises were low access to technology, political instability and inefficient bureaucracy.

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ISSN: 2661-6270 (Print), ISSN: 2661-6289 (Online)
DOI: https://doi.org/10.3126/janr.v7i1.73123

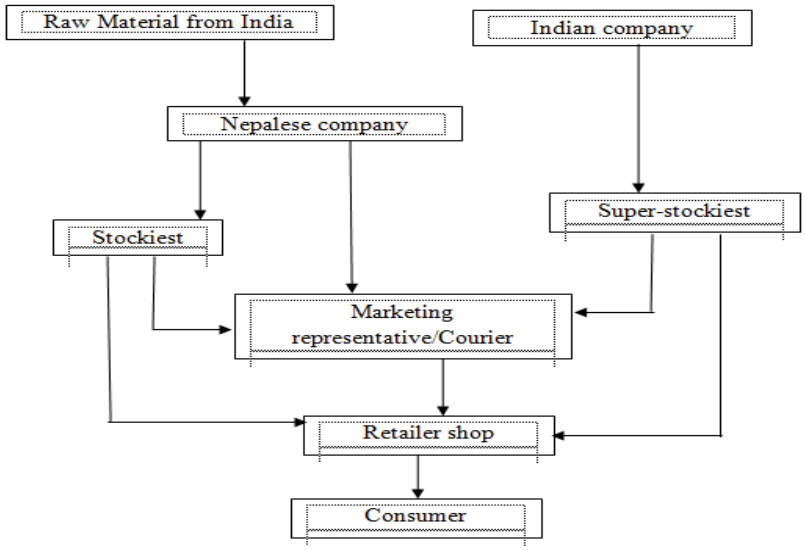

Figure 3: Marketing channel of end products of Ashwagandha

CONCLUSION

End products containing *Withania somnifera* (Ashwagandha) were available in all herbal/medicinal retailer shops in Bharatpur city, with a portion being produced by local industries. All these products were identified as Ayurvedic medicines, primarily in classical formulations and powder form, often sold without prescriptions. The key uses of these medicines include treatment of nervous system disorders, reproductive health issues, and physical weakness, with fewer products targeting rheumatism and digestive system disorders. The research revealed that a wide range of ingredients, primarily medicinal plants, are combined with *W. somnifera* in these formulations, with *Asparagus racemosus* being the most commonly used complementary plant. However, due to the lack of availability and commercial cultivation of Ashwagandha in Nepal, industries are heavily reliant on the Indian market for raw materials. Major challenges faced by *W. somnifera* processing companies include the absence of cultivation of this species in Nepal, lack of incentives, difficult bureaucracy, and political instability. Therefore, in order to reduce dependency on imported raw materials and promote self-sufficiency in the herbal companies, the government of Nepal should prioritize the commercial cultivation of Ashwagandha. Also, Nepal Ayurved Medical Council should develop and effectively implement the ethical guidelines for the production, sale, and prescription of Ayurvedic medicines to regulate products sold without prescription. The findings highlight the significant medicinal value of *W. somnifera* and its potential for further development of herbal medicines, making research on its pharmacological properties and consumer demand essential.

ACKNOWLEDGEMENTS

The authors are grateful to all the respondents/retailer shop owners of ayurvedic medicines for answering the questions of the questionnaire.

Authors' Contributions

Mrs. Binita K.C. collected the data and prepared the first draft of the manuscript. Dr. Gandhiv Kafle designed the research, supervises it, edited and enhanced the manuscript many times and managed the submission process to the journal as corresponding author.

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Conflicts of interest

The author declares that there are no conflicts of interest regarding the publication of this article.

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ISSN: 2661-6270 (Print), ISSN: 2661-6289 (Online)
DOI: https://doi.org/10.3126/janr.v7i1.73123

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