IJPPR
INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals
ISSN 2349-7203
HUMAN

Human Journals
Research Article
October 2020 Vol.:19, Issue:3

Ashwagandha and Moringa Used as Immunity Booster during COVID-19 Pandemic

IJPPR
INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals
ISSN 2349-7203
HUMAN

Pooja Mishra*[1], Sunita Mishra[2]

[1] Student, Department of Food Science and Nutrition, School for Home Science, Babasaheb Bhimrao Ambedkar University, A central University, Lucknow, Uttar Pradesh, India

[2] Professor, Dean, Department of Food Science and Nutrition, School for Home Science, BBAU, A Central University, Lucknow, Uttar Pradesh, India.

Submission: 22 September 2020
Accepted: 28 September 2020
Published: 30 October 2020

HUMAN JOURNALS
www.ijppr.humanjournals.com

Keywords: Phytochemicals, *Escherichia coli*, *Staphylococcus aureus*, Superfood, Coronavirus pandemic, Immunity booster, Exotic, Endurance

ABSTRACT

This present study is based on the *Moringa oleifera* and Ashwagandha, phytochemical, physicochemical, and nutritional properties to enhance immunity during this worst situation in the world i.e. Coronavirus pandemic. Moringa and ashwagandha are the traditional ayurvedic herbal medicine which is used to cure many diseases, increase endurance, enhance strength, boost immunity, enhances healing power. They work as a superfood and medicine, offering enormous amounts of nutrients, vitamins, minerals, antimicrobial properties that our body needs. They are traditionally used to boost immunity and prevent nutrient deficiencies, like malaria, typhoid fever, high blood pressure, and diabetes. In moringa many phytochemicals and bioactive compounds and nutrients are present like flavonoids, tannins, steroid, terpenoids, saponins, glycosides, alkaloids, a bioactive compound like protein, iron, amino acid, vitamin B1, B2 and B3, vitamin C, calcium, potassium, etc, the antimicrobial test is done for this by bacteria Escherichia Coli and Staphylococcus aureus. Ashwagandha in Ayurveda is known as the "Prince of Herbs" because it has an impressively wide variety of Impact of Counseling. It is an exotic Indian herb with substantial stress-relieving properties similar to those of powerful herbs. In ashwagandha phytochemicals like phenol, saponins, glycoside, tannins, etc, in the root of ashwagandha many minerals are present like calcium, iron, manganese, phosphorous and sulfide, in the roots of ashwagandha testing for heavy metals is also done and the results are cobalt, copper, nickel, and mercury are absent but only zinc is present in a good amount.

1. INTRODUCTION

Withania somnifera (Family: Solanaceae) is an important part of Ayurvedic herb, for centuries used in India as a herbal adaptative treatment to improve overall health and longevity. It's a well-loved guy Indian medicinal plant known also as Ashwagandha, Ginseng, and Cherry in Winter. It was a critical Ayurvedic herb and Indigenous healthcare for more than 3000 years. Ashwagandha is a short woody shrub native to the Indian subcontinent which grows in India naturally, Afghanistan, Afghanistan, Italy, Central parts Eastern Africa and the Canaries (Chopra et al., 1980). Ashwagandha is now also cultivated in North America, and its other temperate climates Popularity is increasing. It is enumerated in Indian Materia Medica and is an Ayurvedic, Siddha, and Unani part (The Anonymous, 1982). It was a critical Ayurvedic herb and Indigenous healthcare for more than 3000 years. Ashwagandha is a short woody shrub native to the Indian subcontinent which grows in India naturally, Afghanistan, Afghanistan, Italy, Central parts Eastern Africa and the Canaries (Chopra et al., 1980). Ashwagandha is now also cultivated in North America, and its other temperate climates Popularity is increasing. It is enumerated in Indian Materia Medica and is an Ayurvedic, Siddha, and Unani part (The Anonymous, 1982). Several parts of this plant are used in herbal applications Good care. The root is used for medicinal purposes while seeds, shoots, juice, and leaves were all used and traditionally, too. Ashwagandha was just like Natural Age Therapy (Bone, 1996). There are many benefits and advantages of using Ashwagandha and it was used to cure South Asia and Africa Inflammation, fevers, and as a tonic overall. It was also used to overload the immune system, improve memory, and promote overall well-being (Chatterjee and Pakrashi, 1995). This plant has strong properties Antioxidants, which search and kill the free Radicals concerned about aging and numerous states of the disease. It's good for people who do physical labor or Do a lot of exercises to help your body adapt to physical Tension. It was also used for the strengthening of the Women's reproductive system. Ashwagandha contains many active ingredients of flavonoids the class Withanolide.

Moringa oleifera (drumstick tree), commonly known as sajina or moonga, is considered as the miracle tree due to its marvelous nutritional and medicinal values from thousands of years. India is the largest producer of Moringa. Every part of the drumstick tree is enriched with varieties of ingredients that contribute to its magical health benefits. They are a significant source of calcium, iron, vitamin C, fiber, protein, and β–carotene. Due to its antibacterial and anti-inflammatory action, it can be used as a treating agent for diarrhea, urinary disorder, and gastric ulcer. Moringa leaves can successfully purify blood along with a decrease in blood glucose and cholesterol level.

Moringa, have antioxidant properties, shows high protein content with all the essential amino acids and micronutrient composition indicating its potential to be used as food. Moringa is a rich source of essential amino acids such as methionine, cysteine, tryptophan, and lysine. The leaves are most commonly eaten in the form of powder and used in traditional medicine. Rich in antioxidants, amino acids, vitamins, and minerals, Moringa leaves have many nutritional and health benefits.

Ashwagandha as immunity enhancer:

The use of ashwagandha root powder as an indirect immunity booster as it is loaded with therapeutic properties that enhance other body functions. It indirectly supports the immune system by enhancing protection against infection, e.g. many pieces of research have shown that ashwagandha has anti-inflammatory antioxidant,anti-cholesterol effects that may contribute to protective effects on the heart. It has also shown an increase in energy level and offers mental health benefits, relieving anxiety, depression, and chronic stress, it also lowers the hormone level of cortisol and stress hormone. Some studies indicate that it can also help with the regulation of blood sugar level and improves insulin sensitivity especially in muscle cells, also these effects indirectly support the immune system. The name ashwagandha translates to the "smell of horse" which indicates eminence strength in the body, it can reduce blood sugar level, strengthen muscle mass, improve brain functions. It shows the impact of immunosuppressants on human Band T lymphocytes. Ashwagandha is Adaptogen because of its ability to help the body cope and adapt to stress. This is believed that by improving cell-mediated immunity, it can strengthen the immune function of the body. Various studies show that ashwagandha supplementation can promote an increase in natural killer cell activities which help to fight off infections. Dosages with 300-500 mg of ashwagandha have been shown to lower the cortisol hormone levels by more than 25 %. The Gain of muscle mass and endurance are linked to the low cortisol level and boosting testosterone are the effects of ashwagandha. Its root powder supplement could enhance both immediate and general memory, it improves attention and processing speeds in patients with mild cognitive impairment, it may even help to fight against Alzheimer's and improve memory, task performance, and reaction time. Ashwagandha indicates an anti-inflammatory effect regulating influence in the cell cycle, reducing the proliferation of blood vessels around the tumor and it can inhibit the speed and growth of cancer cells. Ashwagandha has the highest immunity booster nutrients which help to increase the enzyme activity and increase the number of antibodies that help to fight during pathogen attack in the body. Through which the body makes the memory cells fight with viruses, bacteria, and others in the future.

Moringa as immunity booster:

Moringa has many health benefits and helps the whole body, from hairs to a healthy heart. This miracle tree is more nutritious than any other herb and it provides powerful anti-inflammatory benefits. It can also improve nutrition around the world due to its nutrient density and drought resistance ability. When it comes to helping the immune system of the busy it helps in several ways i.e. moringa has high protein content which is most likely the same as the skeleton system of the immune system. Its function depends on the new synthesis of new protein; It contains two times more protein than yoghurt. Moringa contains a high amount of vitamin A, C, E, and vitamin B complexes. They all are known as antioxidant vitamins, they help in reducing the illness and effect of infection; vitamin A and E make healthy cells and prevent cellular mutation. Many researchers determine that the proximate amount of micronutrients like iron, calcium, and vitamin A and C can help to boost immunity during any pathogen entered into the body and make the immunity strong to fight against pathogens.

2. OBJECTIVES:

1. To study the biochemical and functional properties of Moringa and ashwagandha and their potential in the immune system.

2. To study about the nutritive and nutrimedical properties of ashwagandha and moringa.

3. To study the protecting properties of ashwagandha and moringa powder during the covid-19 pandemic.

3. MATERIALS AND METHODOLOGY:

Sample collection

Moringa and ashwagandha were sampled from Lucknow, India. Whole leaves were washed by tap water after by distilled water and air-dried at room temperature under shade; dried leaves were crushed with help of pestle and mortar. 15 gm powder of sample was weighed and processed with 100ml of methanol, hexane, acetone, propane, chloroform, benzene, ether, and ethyl acetate solvent separately for 8 hours (600c) using Soxhlet apparatus.

Antibiotic sensitivity test

The concept of good diffusion of the agar is close to that of the diffusion test of the agar plate. Standardized inoculums concentration of defined volume is distributed uniformly across the gelled agar plate surface. A hole that varies from 6-8 mm in diameter is drilled aseptically in the center with a sterile cork borer. Based on the research micro-organism, a set volume of plant extract is then well injected into the bored agar and incubated at optimal temperature and period (Norrell and Messely, 1997). In this research 20 µL pathogen (Escherichia Coli and Staphylococcus aureus) were spread on nutrient agar media, well prepared,45 µl extract sample was loaded in and incubated at 37^0C for 24 hr in the incubator. After incubation zone of hydrolysis was determined.

Phytochemical test

The plant extracts phytochemical components were tested using normal protocols. For 3 days with intermittent shaking, the 50 g of air-dried powdered samples is percolated in 200ml each of 95 percent ethyl alcohol, petroleum ether, and toluene, separately. Instead, the samples were extracted using filter paper Whatman No. 1. Based on a rotary evaporator, organic solvent filtrates were condensed in a vacuum, and the aqueous extracts were dried using a water bath to acquire the crude extract.

Determination of Antibacterial Activity:

The antibacterial activity of the Moringa leaf extracts was determined by using the nutrient agar well diffusion method. Nutrient agar was inoculated with the given microorganisms by spreading the bacterial inoculums on the semi-solid media on the Petridis. Wells of 6mm were punched in the nutrient agar media and filled with plant extracts. The plates were incubated at 37°C for 24 hours and the antimicrobial activity was assessed by measuring the diameter of the zone of inhibition. The antibacterial activity of the moringa leaves extracts was evaluated by comparing their zone of inhibition with a standard antibiotic.

4. RESULTS AND DISCUSSION

Summary of phytochemical test for moringa leaves:

Alkaloids: 5ml of sample extract then add oil. HCL drop by drop, filter it, add dragendorff's reagent, it gives orange-brown colored precipitation, it shows the presence of alkaloids.

Flavonoids: 5ml aqu. Filtrate of sample extract adds 25ml of dil. H2So4 and boil it for 15 min. Cool and neutralize with10% sodium hydroxide, add 5ml Fehling's solution, it gives Brick red coloured precipitation it shows the presence of flavonoids.

Terpenoids: 5 ml of sample extract add 2ml of chloroform and few drops of conc. H2SO4, gives a layer of reddish-brown color which is the indication of terpenoids.

Tannins: 5ml of dil. Sample extract adds 4-5 drops of 10% ferric chloride which gives blue or green color precipitation which shows the presence of tannins.

Saponins: 2ml of alcohol dil. With distilled water add 2ml of aqu. Sample extract, shake for 15 min. Foams are formed which is the indication of saponins.

Steroids: 5ml of sample extract add a few drops of conc. hydrochloric acid in chloroform, the appearance of red colour in the chloroform layer which indicated the presence of steroids.

Table No. 1: List of phytochemical tests for moringa leaves powder.

Phytochemicals	Methanolic extract	Petroleum extract	Acetone extract	Chloroform extract
Alkaloids	NA	NA	NA	Present
Flavonoids	Present	NA	NA	Present
Terpenoids	Present	Present	NA	NA
Tannins	Present	NA	Present	Present
Saponins	Present	Present	Present	NA
Steroid	NA	present	NA	present

Antimicrobial activity for moringa:

Table No. 2: List of antimicrobial tests for moringa leaves powder.

Microorganism	Ethanol	Hexane	Ethyl acetate
Staphylococcus aureus	9mm	NA	10mm
Escherichia Coli	4mm	NA	8mm

Phytochemical test for ashwagandha:

Tannins: 5ml aqus. Extract of sample add vanillin alcoholic HCL reagent (vanillin 1 gm+10 ml conc. HCL +10 ml alcohol), it gives brick red colour which indicates the presence of tannin.

Glycoside: 2ml sample extract adds glacial acetic acid and few drops of FeCl3 and few drops of conc. H2So4, it gives reddish-brown colour with few layers changing, the upper is a bluish-green colour which indicates the presence of glycoside.

Saponins: 1ml of aqus. Sample extract, add 10ml of distilled water and shaken in a cylinder for 15 min, No formation of forth indicates the absence of saponins.

Phenol: 2ml of sample extract in a test tube add 2 ml of FeCl3, it indicates deep green or red, violet and blue colour solution which shows the presence of phenol.

Table No. 3: list of phytochemical tests for ashwagandha powder.

Phytochemicals	Result
Tannin	Present
Glycoside	Present
Saponins	NA
Phenol	Present

Testing of minerals for ashwagandha:

Calcium: 5ml of sample extract add 2 drops of conc. H2So4 gives white precipitation which indicates the presence of calcium.

Iron: 0.5ml of sample extract add 3 drops of KSCN reagent, the formation of red colour indicates the presence of iron.

Manganese: 0.5ml of sample solution add 1 ml of 1%KOH solution, add 5 drops of Benzidine reagent, it gives blue colour which indicates the presence of manganese.

Phosphorous: 0.5ml of sample solution add 2 drops of ammonium molybdate reagent, it gives yellow colour which indicates the presence of phosphorus.

Sulfur: 0.5ml of sample extract solution add 2 drops of BaCl, white precipitation of BaSo4 appears which indicates the presence of sulfur.

Table No. 4: list of Mineral tests for Ashwagandha.

Minerals	Result
Calcium	Present
Iron	Present
Manganese	Present
Phosphorous	Present
Sulfur	Present

Testing of heavy metals for ashwagandha:

Cobalt: 20 mg powder of sample dissolved in 0.5ml of distilled water add a few drops of H2So4 with few drops of dil. In the solution of sodium hydroxide, no blue precipitation was found which indicates the absence of cobalt.

Copper: 25 mg of powdered sample in 1 ml of distilled water, add dil. Ammonium solution dropwise until the blue solution was obtained, heated to boiling, add 2% w/v alcoholic solution of alpha-benzoin oxime, no green precipitation was found which indicates the absence of copper.

Mercury: 25mg of sample powder in 1ml of distilled water, add 2M of sodium hydroxide until the solution becomes strongly alkaline, no dense yellow precipitation was found which indicates the absence of mercury.

Zinc: 25 mg of powdered sample in 2-3 ml of distilled water, add 0.2ml of 10M sodium hydroxide solution, white precipitation was found, add 2mml of 10M sodium hydroxide solution,5ml of 2M ammonium chloride, 0.1ml of sodium sulfide solution. A flocculent white precipitation was found which indicates the presence of Zinc.

Nickel: 20 mg of sample powder in 0.5ml of distilled water, acidified with a few drops of dil. HCL, add a solution of sodium hydroxide was added drop by drop, no blue precipitation was formed which indicates the absence of nickel.

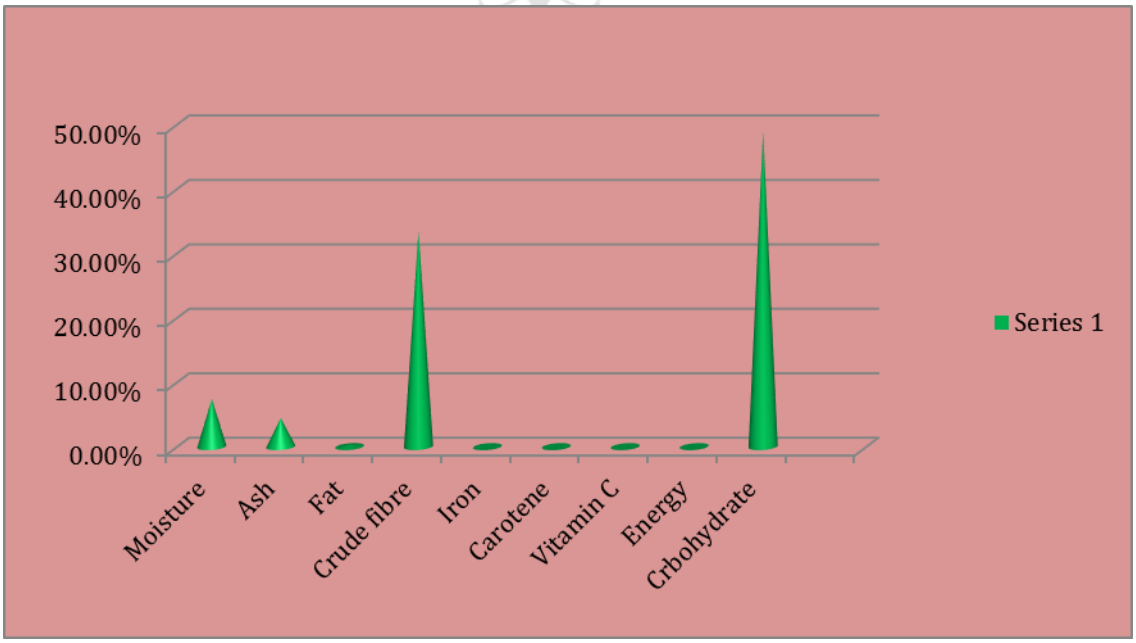
Table No. 5: list of heavy metal tests for ashwagandha.

Heavy metal	Result
Cobalt	NA
Copper	NA
Mercury	NA
Nickel	NA
Zinc	Present

Proximate estimation for ashwagandha root powder:

Table No. 6: proximate tests for ashwagandha

Nutrients	Nutritive values
Moisture %	7.40%
Ash %	4.44 g
Carbohydrate %	48.9 g
Fat %	0.4 g
Crude fibre	33.4 g
Iron	3.4mg
Carotene	75.9 mg
Vitamin C	5.9 g / 100g
Energy	245k cal

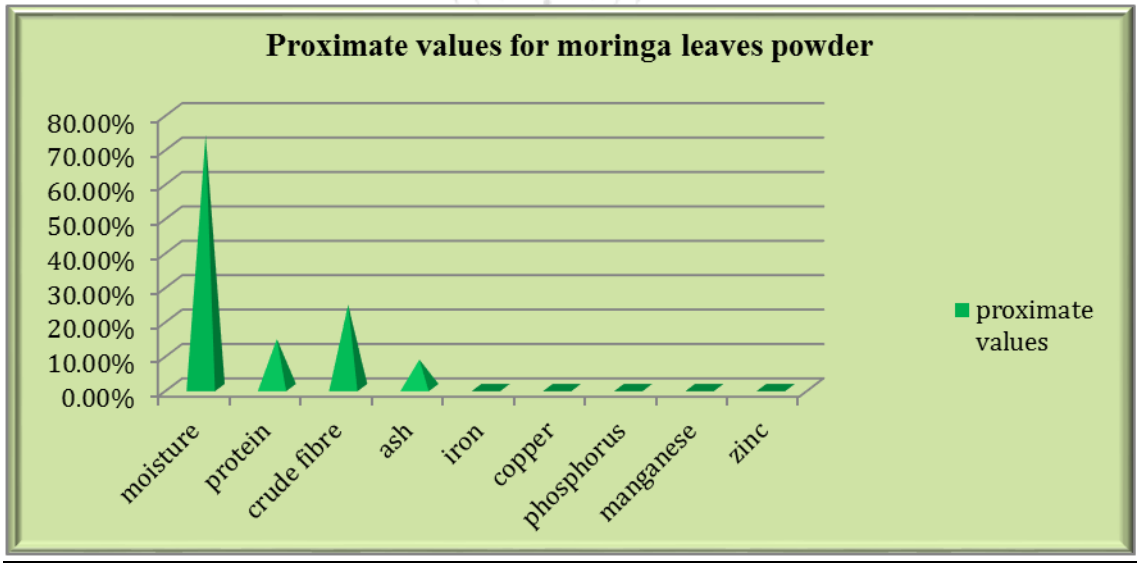


Graph 1. Graphical representation of proximate analysis for ashwagandha

Proximate estimation for moringa leaves powder:

Table No. 7: proximate tests for moringa leaves powder.

Nutrients	Nutritive values for moringa leaves powder
Moisture %	73.40%
Protein %	14.135%
Crude fiber	24.09%
Ash %	8.15%
Iron	112.059ppm
Copper	8.743ppm
Phosphorus	34.89ppm
Manganese	73.242ppm
Zinc	68.345ppm



Graph 2. Graphical representation of proximate analysis for Moringa leaves powder

Nutrients present in ashwagandha and Moringa powder per 100 gm.

Table No. 8: list of nutrients present in Moringa leaf powder per 100 gm

Nutrients	Moringa leaves
Carbohydrate	9.6g
Dietary fibers	2.2g
Fat	1.9g
Protein	8.4g
Vitamin A	84ug
Vitamin B_1	0.105mg
Vitamin B_2	0.114mg
Vitamin B_3	1.6mg
Vitamin B_5	0.48mg
Vitamin B_6	0.130mg
Vitamin B_9	42ug
Vitamin C	8.4mg
Calcium	99.2mg
Iron	1.5mg
Magnesium	36.1mg
Manganese	0.117mg
Phosphorus	70.6mg
Phosphate	473mg
Zinc	0.83mg
Sodium	72mg

Table No. 9: list of nutrients present in ashwagandha root powder in per 100 gm

Nutrients	Ashwagandha root powder
Carbohydrate	48.9g
Crude fiber	33.4g
Fat	0.4g
Calcium	24mg
Potassium	2.07mg
Phosphorous	2.06mg
Sodium	0.53mg
Copper	7.9mg
Iron	3.4mg
Zinc	37.4mg
Manganese	27.6mg
Vitamin C	5.9g

5. CONCLUSION:

The significant testing of ashwagandha and moringa powder indicates that both herbs are a miracle and both boost the immunity of the human body which is very useful during this covid-19 pandemic.ashwagandha and moringa both are ayurvedic and herb which is used most frequently in Ayurveda as a medicine. They both can cure many diseases like cancer, arthritis, dementia, depression, Alzheimer's, anxiety, work as an immunity enhancer, improve brain functions, increase muscle mass, strength, endurance, boost testosterone and increase male fertility, increase cardiovascular health, etc. ashwagandha and moringa have high protein, vitamin, minerals content which help in most of the body function and increase the enzyme activity which enhances the immunity power against any bacteria and virus.

6. ACKNOWLEDGMENT:

I'm highly indebted and express my gratitude to my supervisor Prof. Sunita Mishra, Dean and Head Department of Food Science and Nutrition, for her kind suggestion and for providing me the opportunity to work on this project. I would like to express my sincere regards to my parents who support me a lot while completing this research.

7. REFERENCES:

[1] Aggarwal, R., Diwanay, S., Patki, P., Patwardhan, B. 1999. "Studies on immunomodulatory activity of Withania somnifera (Ashwagandha) extracts in experimental immune inflammation". J Ethnopharmacol. 97: 27-35.
[2] Andallu, B., Radhika, B. 2000. Indian Journal of Experimental Biology. 3: 607-609
[3] Anonymous. 1982. The Wealth of India. Publications and Information Directorate, Council of Scientific and Industrial Research (CSIR), New Delhi. (X): 580-585.
[4] Anonymous. 2007. The Unani Pharmacopoeia of India. Depart. of AYUSH, Ministry of Health & Family Welfare, Govt. of India, New Delhi. I (I): 7-8.
[5] Sangita Kumari and Alka Gupta. "Nutritional composition of dehydrated ashwagandha, shatavari and ginger root powder(2016), international journal of home science,2(3), 69.
[6] Mahima, A. Rahul, R. Mandil, A.K. Verma and V Kumar. "Nutritional potential of moringa oleifera leaves in Uttar Pradesh, India" Indian Journal of medicinal plant (2014), page-8.
[7] Davis, L., Kuttan, G. 2000. "Immunomodulatory activity of Withania somnifera". J Ethnopharmacol. 71 (1-2): 193-200.
[8] Lakshmi-Chandra Mishra, Besy B Singh, Simon Dagenais, "Scientific basis for the therapeutic use of Withania Somnifera", (2000), Alternative medicinal review, volume 5(4), page no.334.
[9] Krutika J, Swagata Tavhare, Kaplwsh Panara, Praveen Kumar A, Niteshware Karea, " Studied of Ashwagandha", (2016), IJPBA, volume 7(1), page no-1-2.
[10] Archana, J. S., Paul, R., & Tiwari, A. (2011). Indian Medicinal Plants: A rich source of natural immunomodulator. International Journal of Pharmacology, 7(2), 198-205.
[11] https://blog.kulikulifoods.com/2019/12/17/improve-immunity-moringa/
[12] Satya Prakash Mishra, Pankaj Singh, Sanjay Singh(2012). "Processing of moringa oliefera leaves for Human Consumption", Bulletin of environment, pharmacology and life Sciences, 2(1), 28.
[13] https://drvaidyas.com/10-amazing-health-benefits-of-immunity-booster-ashwagandha
[14] Norrell, S. A., & Messley, K. E. (1997). Microbiology laboratory manual: principles and applications. Prentice-Hall.
[15] Chopra, R.N., Nayar, S.L., Chopra, I.C. 1980. Glossary of Indian Medicinal Plants. Council of Scientific & Industrial Research. New Delhi: 191, 258.
[16] Chatterjee, A, Pakrashi, S.C. 1995. The Treatise on Indian Medicinal Plants. (4):208-212.
[17] Bone, K. 1996. Clinical Applications of Ayurvedic and Chinese Herbs. Monographs for the Western Herbal Practitioner. Australia: Phytotherapy Press:137-141.
[18] Chopra, R.N., Nayar, S.L., Chopra, I.C. 1980. Glossary of Indian Medicinal Plants. Council of Scientific & Industrial Research. New Delhi: 191, 258.
[19] pratiksha Gutam and Sunita Mishra. "Allevating malnutrition among rural children by using Moringa leaves", International Journal of Current Research in Life Sciences(2018),7.
[20] Pratiksha Gautam and Sunita Mishra. "Dietary Benefits of Incridible Plant Moringa oleifera Leaves", International Journal of Science and Research(2018),7(10).
[21] Helene Kekina, Oksana Shevchuk, Nadezhda Golublkina, Lidia Logvinenko, Ludmila Khlipenko, Ann Molchanova and Gianluca Caruso. "Antioxidant properties and elemental composition of Withania Somnifera L", Journal of International Scientific Publication (2019), 7, 98.

[22] Rasha Khalid Abbas, Fatma S. Elsharbasy and Abdalfatah Abdalla Fadlelmila. " Nutritional Value of Moringa Olifera, Total protein, amino acid, vitamin, minerals, carbohydrate, total fat and crude fibre under the semi arid condition of Sudan", Journal of Microbial and Biochemical Technology(2018),10(2),57.