

Authentication of *Andrographis paniculata* in relation to Immunity

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Abstract

Andrographis paniculata had multiple clinical applications in traditional systems of medicine. This research article deals with the estimation of immunity related compounds from *Andrographis paniculata* of aerial parts . Quantitative phytochemical analysis was carried out by UV visible spectrophotometer. Physico-chemical analysis was done to standardize the plant material so as to ensure the use of genuine material. The result of quantitative phytochemical studies confirmed that itcontains various secondary metabolites like total phenol, bound phenols, ortho dihydric phenols,flavonoids, tannins, anthocyanin, Leucoanthocyanin, chlorophyll, vitamin C, total carotenoids.

UV visible spectrophotometer analysis confirmed the *Andrographis paniculata* contain different immunity booster compounds with varying amounts. This active constituent also exhibits antioxidant properties and also reduces viral infection therefore, it is used during Covid 19pandemic.

Keywords: *Andrographis paniculata* , Phenolic compound, Ascorbic acid, Chlorophyll pigments, Spectrophotometer.

Introduction

Now –a-days, we are facing many global health problems. Infectious disease is one of them. It is a serious global health problem that leads to a high mortality rate.

World has recently faced most formidable threat in human history, Pandemic COVID-19. Infectious disease leads the question of survival, because almost all time, mutation in strains of viruses lead to the emergence of infectious diseases with new symptoms and consequences. Virus infections in humans lead to diseases ranging from mild upper respiratory tract infections to severe pneumonia, acute respiratory failure syndrome and death.

- Why such conditions created?

There are many reasons, but nutritional food is one of them. Increasing Population requirement of food also increases, Food which has taken sometime less nutritional or seasonal food not available during proper duration people faces lack of deficiency or diseases. Eating enough nutrients as part of a variety of diet is required for the health and Function of all cells, including immunity. The immune system needs energy and a variety of nutrients to produce a functional immune response. Less nutritious food or ultraprocessed food affects the immune system through gene expression, cell activation,modification of signalingmolecules.

Each stage of the body immune response relies on the presence of many micronutrients, nutrients help the immune system in several ways working as an antioxidant to protect healthy cells, supporting growth and activity of immune cells and producing antibodies. Deficiency of single nutrients can alter the body immune response. For fulfillment of requirement of nutrients, we have taken various type of medicine, most people give Preference to allopathic medicine.

Majority of medicine works on one drug, one target and also sometimes causes side effects. Now –a-days, the philosophy of drug discovery has transformed into “one drug, multi target form is necessary because during severe conditions of COVID19, many people have wait for vaccine and strengthen immunity drug, Death of many people occur due to lack of treatment. To overcome this problem scientists this problem scientist was tried to research on multi target drug and natural product-based drug from medicinal plant to reduce side effect. On other hand *Andrographis paniculata* was used during pandemic COVID 19 .During the pandemic situation COVID 19, *Andrographis paniculata* extract was taken in city &village by every person not only during COVID19 but also during fever, cold etc. 1st wave 900-1000 people had taken this plant extract. Because during this period more people who lived outside the village and state should come. They were infected by COVID 19 and every person was cured, no severe situation occurs like hospitalization, ventilation etc.

During the 2nd wave situation, one person could be on ventilation; He also consumed plant extract and was cured. *Andrographis paniculata* extract is very helpful as an immunity booster for every person in My living area and this is also my own experience. Thus, *Andrographis paniculata* have the capacity to be an immunity booster and to prevent and cure from infectious disease. I also tried to study medicinal plants which had played a major role as an immunity booster and also used during COVID 19 pandemic where I lived. Because this plant has more medicinal properties, contains more secondary metabolites which are also present in another medicinal plant but some second day metabolites are species specific and also vary in their amount, these characteristics are shown by *Andrographispaniculata*. It Contains active secondary metabolites that includes lactones, diterpenes, flavonoides, xanthones, Andrographolide, neo Andrographolide, iso Andrographolide like this: 142 secondary Metabolites are isolated. These are the most bioactive compounds from aerial parts of *Andrographis paniculata* aerial parts, leaves, shoots, whole plants and even roots. Andrographolide high amounts in leaves & stems. These compound shows different types of pharmacological activities including antibacterial anti-biofilm, antiviral, Anti-HIV anti-influenza, Herpes, simplex virus, dengue virus, serotype, anti-Epstein Barr papillomavirus, and fungal, anti-parasitic, Virus, pestivirus, flavivirus, human antimalarial Cytotoxicity, antileishmaniasis, antiproliferative, anti-inflammatory, antiplatelet aggregation phagocytosis, anti-complement.

Materials and method

Andrographis paniculata Plant material was collected from amravati region, plant identification from an "Associate in the compilation of flora of Marathwada (V.N. Naik). "*Andrographis paniculata* was grown in normal condition extremal fertilizer or nutrients given to this plant except water. After flowering and fruiting during February end, *Andrographis paniculata* collected in a natural dried condition. After drying it is slightly under normal temperature 4-5day because their shoot part was not properly dried. When the plant completely dried to make a powder from this plant by using an electric blender. 1 gm powder was used from this plant for estimation of different phenolic compounds, Ascorbic acid (vitamin C) and some chlorophyll pigments. for estimation of above compounds standard methods was used (Thimmaiah,S. R. 1999).

It's increasing use in pandemic COVID I9 situations and many secondary metabolites are present in the plant. Knowing this importance, we have selected this plant and estimated some compounds which are very useful for human beings not only in medicinal purposes but also in daily life for immunity booster.

Observation table: I

Estimation of compound	Weight of material	Total volume of extract	Total volume taken for analysis	Absorbance nm	Amount of compound (in mg /100g)
Total phenol	100mg	5ml	0.1ml	650nm (0.4)	13mg
Ortho dihydric phenol	100mg	5ml	0.1ml	515nm (0.4)	13mg
Bound phenols	100mg	10ml	0.1ml	290 nm (0.231)	15mg
Tannin	100mg	5ml	1ml	500 nm (0.131)	3.5mg
Total carotenoids	100mg	10ml	1ml	450nm (0.6)	565 mg

Anthocyanin	100mg	10ml	1ml	525 nm (0.6)	1.8mg
Leucoanthocyanin	100mg	5ml	1ml	550 nm (0.25)	1.8mg
Vitamin C	100mg	5ml	0.1ml	540 nm (0.36)	1.8mg
Chlorophyll A	100mg	10ml	0.1ml	Chl a -663 nm (0.65)	0.5mg
Chlorophyll B	100mg	10ml	0.1ml	Chl b- 645nm 0.8	0.9mg
Total chlorophyll	100mg	10ml	0.1ml	Total chlorophyll	1.4mg

Result and discussion

Aerial parts of *Andrographis paniculata* were taken for the phytochemical evaluation for phenolic compounds and Vitamins. The extracts of the plant parts were taken and their extracts were subjected to chemical reactions and then analyzed on the UV Visible spectrophotometer. The absorbance was measured at the respective wavelengths The absorbance was plotted on the standard graph for respective compounds to be analyzed and the number of compounds (mg/gram) of the plant material was calculated and results were obtained.

The amount of compound estimated from the extract of *Andrographis paniculata* was in (in mg/100g), Polyphenols include (phenol 13 mg /100g, bound phenols 115 mg/100 mg, ortho dihydric phenol 13 mg /100g, total carotenoids 565mg /100g, Leuco anthocyanins 1.8mg/100g, anthocyanin 1.8mg /100g)VitaminC 1.8mg /100g, chlorophyll a 1.5mg/100g, chlorophyll b 1.9mg/100g, total chlorophyll 1.4mg/100g.

polyphenols should be consumed, there are benefits ranging from intakes of 500mg to 1500mg per day.

The recommended dietary allowance for adults 19 years and older is 90 mg daily for men and 75 mg for women. Smoking can deplete Vitamin C levels in the body, so an additional 35 mg.Total carotenoids is precursor of vitamin A is 900 mcg for adult men and 700mcg for adult women (Mayo clinic staff, 2020).If tannin increases more than causes adverse effects, it requires moderate levels according to the body's needs. Polyphenols, vitamins C are used as antioxidants, metabolic function, conversion of tryptophan to serotonin and also absorb UV radiation. Chlorophyll is necessary for metabolic compounds This is the requirement of nutrients in our

body. The obtained knowledge it is concluded that the amount of requirement of nutrients in the human body, *Andrographis paniculata* can help to fulfill the requirement of nutrients and maintain the health of the body.

Obtained knowledge concluded that *Andrographis paniculata* is used as therapeutic agent, pharmacological agent, antiviral, antibiotics, anticancer inflammatory, hepatoprotective activities.

Using signal transduction technology potential use of this plant for reducing viral infection.(Siddharth mishra 2007) ,also used in Ethno medical practices.

Conclusion

From the above discussion, it is concluded that the allopathic medicine we have been taking during the COVID19 period to boost immunity could also mimic the same result from this plant. Therefore, we use this plant extract in medicine as an immunity booster and various infections and against COVID 19.In future the drug derived from this plant is responsible for its health-promoting effects for human beings.

Phenolic compounds and terpenoids compounds are also present in this plant with andrographolide and neo andrographolide. This compound also exhibits many medicinal properties. The presence of a significant number of different compounds justifies the importance of *Andrographis paniculata*. The research work on *Andrographispaniculata* done on these plants is limited to qualitative analysis and not much work has been done to estimate compounds, there is need to much more work for quantitative research to evaluate the different compounds. Research should also be done to determine the molecular structure of phenolic compounds as they differ from plant to plant. Due to the medical importance, there is much more scope in the pharmaceutical industry for the synthesis of new drugs.

The presence of a significant amount of total phenols, ortho-dihydric phenols, bound phenols, Leuco anthocyanin, Anthocyanin, vitamin C, and carotene justifies the importance of *Andrographispaniculata*. The antiviral, antidiabetic, anticancer-inflammatory, and hepatoprotective activities of this plant are due to the presence of the above compound. Thus the plant is authenticated to be used to increase the immunity of human beings.

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