

## ETHNOBOTANICAL SCREENING OF MEDICINAL FLORA OF POONCH AZAD KASHMIR HAVING POTENTIAL TO COMBAT COVID-19.

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**ABSTRACT:** Novel Corona Virus 2019 has become a serious threat to human health. Role of Chinese herbal treatment is evident from recent studies which report utilization of medicinal plants for treatment of viral respiratory diseases including COVID-19. Main purpose of this study is to document local medicinal herbs of Azad Jammu Kashmir which are effective against viral infectious diseases included in Traditional Chinese Medicines (TCM). 15 medicinal plants including 11 herbs, 2 tree and 2 shrub respectively belong to 10 families were documented from Poonch area AJK. Traditional knowledge is collected from local inhabitants while TCM usage was reported from Traditional Chinese Medicine Systems Pharmacology database. Documentation of local medicinal plants based on current Chinese published research provides insight into the conventional usage of plants for the treatment of rapidly spreading coronavirus. Further, this ethnobotanical investigation paved the way for research, drug development and an integrated system of health management for the treatment of COVID-19.

**Key word:** Azad Jammu Kashmir, COVID-19, Ethno botany, Traditional Chinese Medicines.

### INTRODUCTION

In China, a novel coronavirus (2019- nCoV) having the potential of infectious transfusion has been investigated [1]. World Health Organization announced that 2019- COVID-19 is an alarming threat to human health worldwide and designated this dangerous virus as COVID-19. This virus is similar to another virus like SARS virus possessing final, natural and intermediate hosts respectively. There is a challenge for us to control it due to its high transmissibility and comparatively lower death rates [2].

The use of Chinese herbal medicinal and their active natural compounds was found effective during the treatment of SARS virus [3]. An integrated system of medicines composed of modern allopathic medicines and TCM was used successfully in China to treat COVID-19 patients monitored by the Nation Health Commission of China Research on the utilization of herbal treatment is a topic of great concern. More than 120 medicinal plants from China have been reported to have potential to cure COVID-19[4].

Currently the main standard which is used to control COVID-19 is to strengthen human bodies against adverse environmental effect. 6 medicinal plants including Astragalus membranaceus (Fisch.) Bge (Huangqi), Atractylodes macrocephala Koidz. (Baizhu), Forsythia suspensa (Thunb.) Vahl. (Lianqiano), Glycyrrhiza glabra L.(Gancao), Lonicera japonica Thunb ( Jin yin hua) and Saposhnikovia divaricata (Turcz.) Schischk. (Fagefeng) from china were used effectively for COVID-19 treatment. However decoction of these plant was found effective only for one weak [5]. History has strong evidence that properly identified plants were used for treatment of many diseases since human creation [6].

Ethno botany is involved in understanding of effective relationship between plant life and human beings in form of economy and culture [7]. Indigenous health system base on local plants got great significance for scientists since last decade and utilization of medicinal and aromatic plants increases drastically[8, 9]. (Therapeutic values of plants were tremendously investigated recent years around the world [10]. Azad state of Jammu Kashmir having different climatic zones is situated between 73°28'14 East longitude and 34°22'25

North latitude. AJK is blessed with variety of medicinal and aromatic plants [11]. Medicinal plants have been commonly used for curing infectious diseases. Antiviral compounds are isolated from these plants

having broad-spectrum antiviral effectiveness against quickly spreading viral infections [12].

With outbreak of COVID-19, usage, trade and demand of medicinal plants are increasing day by day. Traditional Chinese Medicines (TCM) achieved importance during corona pandemic. Sustainable future usage of medicinal plants is at risk and well organized scientific enterprise is needed to explore and document plant wealth of world[13,14].

Although, research on utilization of medicinal herbs against novel corona virus is still at the preliminary stage. There is urgent need of hour to screen medicinal herbs which may be effective against deadly COVID-19. Present research work aims to identify and document traditional usage of local medicinal plants from the Poonch area of AJK which have been explored in the Traditional Chinese Medicine System against COVID-19.

### MATERIAL AND METHOD

Target antiviral activities possessing medicinal plants were selected according to [15]. After that, an exclusive survey was conducted during the month of March and April 2020 to collect and document these targeted plant species. Plants were collected from all ecological zones of the Poonch area. Field images of each plant were taken according to [16] to

provide convenient identification for end users. Collected plant specimens and digital images were identified with the help of Flora of Pakistan [17, 18] Flora of China, Flora of North America and taxonomic literature. TCM names were assigned to these plants using the TCM Database. TCM usage was recorded from Traditional Chinese Medicine Systems Pharmacology database TCMSp.

Local traditional knowledge was gathered from hakims, old peoples, students, teachers, doctors, pharmacists and local people by formal and informal interviews

[19, 20]. Recorded information was tested and correlated with already published literature. Finally, herbarium specimens were pressed, dried and mounted on herbarium sheets

according to approved procedures

[21, 22]. Specimens were poisoned with 30% sodium pentachlorophenate and submitted to Azad Jammu Kashmir Medicinal and Aromatic Plant Herbarium(AJKMAPH) (flora.parc.gov.pk) at Govt. Post Graduate College Abbaspur Poonch AJK.

## RESULTS

15 available plants including *Aster tataricus* (L.)f., *Bupleurum scorzonifolium* Willd, *Chrysanthemum coronarium* L., *Cibotium barometz* (L.) J.Smith, *Erigeron breviscapus* (Vant.) Hand-Mazz., *Eriobotrya japonica* (Thunb.) Lindl., *Euphorbia helioscopia* L., *Fagopyrum tataricum* (L.) Gaertner, *Hovenia dulcis* Thunberg, *Inula japonica* Thunb., *Lepidium apetalum* Wild., *Lonicera japonica* Thunb, *Morus alba* L. *Peucedanum ferulaefolium* Gilli., and

*Tussilago farfara* L., were documented from the Poonch area. TCM names like Sang Ye (*Mori follum*) is actually white mulberry leaf while Sang Bai Pi (*Mori cortex*) is its root. Similarly, Ju Hua (*Chrysanthemum flos*), Xuan Fu Hua (*Inulae flos*), Jin Yin Hua (*Lonicerae japonicae flos*) and Kuan Dong Hua (*Farfrae flos*) are flowers of these plants respectively. Zhi Ju Zi (*Hoveniae dulcis semen*) and Ting Li Zi (*Lepidii semen*) are seeds of these plants. Chai Hu (*Radix bupleuri*), Qian Hu (*Peducedani radix*) and Qian Hu (*Peducedani radix*) are roots of respective plants. Pi Pa Ye (*Eriobotryae folium*) is leaf of loquat. Zi Wan (*Asteris radix et rhizoma*), Gou Ji (*Cibotium barometz*) and Jin Qiao Mai (*Rhizoma fagopyri cymosi*) are rhizomes of interpreted plants. Deng Zhan hua (*Erigeron breviscapuse*) and Ze Qi (*Euphorbiae helioscopiae herba*) are names of whole plants in Traditional Chinese Medicines. Botanical name, TCM name, local name, English name, family, habit, part used, TCM usage and local uses of plants under study are mentioned in (Table.1).

Further, 14 field images, 1 of root and 1 dry specimen of targeted plants were taken to avoid taxonomic errors and to support taxonomic description (Fig.1). In this research 10 families were reported (Fig.2) among which Asteraceae was the dominant family with 5 species following Apiaceae with 2 species. In the case of habit, the most dominant habits recorded in this study were herbs (11 reports) followed by trees (3 reports) and shrubs (2 reports) respectively and depicted in (Fig.3).

In this study, the most used part is a flower (7 reports) followed by a root (4 reports), a seed (2 report), leaf (1 report), rhizome (1 report), whole plant (1 report) (Fig.4). During study

5 modes of preparations of traditional medicines were recorded (Fig.5), out of which decoction was common (8 reports), followed by infusion (3 reports), powder (1 report), paste (1 report) and tea (3 reports).

In this work, ethno botanical screening of 15 local plants was carried out from the Poonch area of Azad Kashmir which

revealed the medicinal importance of local flora.

## DISCUSSION:

The worldwide spread of COVID-19 posed a serious threat to the world's health system. Treatment of this pandemic has become a challenge to health professionals. Scientific research about the use of modern and traditional medicines to treat this virus and published literature is limited. Despite these problems, in light of an updated Chinese research paper local plants were investigated which were found effective in COVID -19 treatments.

The present study is parallel to previous investigations that traditional herbal remedies are easy and cheap sources of treatment for human ailments [23]. Our investigations revealed a resemblance with earlier studies which reported that color photography helps taxonomists in solving problems of obscurity and ambiguity in plant taxonomy description. Images can be used to demonstrate taxonomic and morphological characteristics [24]. Asteraceae and Apiaceae are important families having plants with great medicinal values[25, 26]. Results resemble with recently published literature *Sanginia*[27] in the Khurum agency[28] and in Alpine and subalpine ecological zones [29].

Formation of herbal medicine from herbs is cost and time-effective [30]. A similar investigation was carried out in South Asian countries India [31]. and Nepal [32]. Common use of flowers or plants in the pharmaceutical and cosmetic industry has been reported in many previous studies due to high medicinal values[33],[34]. Utilization of decoction of plant material particularly root was common and suitable for treatment of ailments. Important medicinal compounds found in plants can easily extracted by boiling process[35],[36].

The emergence of COVID-19 has opened the door for scientists to utilize a combination of modern and natural herbal medicines to

cure the current pandemic [37]. In vitro, screening of Chinese herbs showed anti-coronavirus activities due to their natural compounds [38]. The importance of herbal medicines was observed during the treatment of infectious diseases during severe acute respiratory syndrome spread in China, TCM plant-based natural products have provided alternative treatment for many decades for the treatment of various endemic and pandemic human diseases [39]. The presence of natural antiviral compound in medicinal plants urge scientists throughout the world to explore and identify natural plants having COVID-19 inhabiting compounds [40].

It has been already reported that natural compounds found in Chinese herbal treatment are useful for corona treatment [41, 42].

The present investigation correlates to previous research in that plants were identified and investigated for antiviral compounds and they are isolated for medicinal purposes [43, 44, 45].

**Table I: Ethno botanical investigation of local plant effective against COVID-19**

Sr. No	Botanical name	TCM Name	Local name	English name	Family	Habit	Part used	TCM usage	Local usage
1	<i>Aster tataricus</i> (L.) f.	Zi Wan (Asteris radix et rhizoma)	Usmani Tara	Tatarian Aster	Asteraceae	H	Root	Cough, respiratory disorder	Anti tumor, carminative
2	<i>Bupleurum scorzonerifolium</i> Willd	Chai Hu (Radix bupleuri)	Pili Jeveli	Bupleurum	Apiaceae	H	Root	Antiviral, antipyretic	Antidote
3.	<i>Chrysanthemum coronarium</i> L.	<i>Ju Hua</i> (Chrysanthemum flos)	Gul-i-Dodi	Chrysanthemum	Asteraceae	H	Flower	Cold, flu	Diuretic
4.	<i>Cibotium barometz</i> (L.) J. Smith	Gou Ji (Cibotium barometz )	Patbha	Cibotium,manfer n	Cibotiaceae	H	Rhizom e	Back pain	Worm killer
5.	<i>Eriobotrya japonica</i> (Thunb.) Lindl.	Pi Pa Ye (Eriobotryae folium)	Loquat	Loquat	Rosaceae	S	Leaf	Carminative, cough	Anti diabetic
6.	<i>Erigeron breviscapus</i> (Vant.) Hand-Mazz.	Deng Zhan hua (Erigeron breviscapuse)	Usmani tara	Aster plant	Asteraceae	H	Flower	Carminative, cardiovascular	Carminative, cough, asthma
7.	<i>Euphorbia helioscopia</i> L.	Ze Qi (Euphorbiae helioscopiae herba)	Dodal	Spruge	Euphorbiacea e	H	Whole plant	Cough, worm killer	Wart, eczema
8.	<i>Fagopyrum tataricum</i> (L.) Gaertner	Jin Qiao Mai (Rhizoma fagopyri cymosi)	Chati Musloon	Wild buckwheat	Polygonaceae	H	Rhizom e	Cough, Pulmonary abscess	Carminative, immunity booster

**H\*=Herb, S\*= Shrub, TCM\*= Traditional Chinese Medicine ,T\*= Tree.**

9.	<i>Hovenia dulcis</i> Thunberg	Zhi Ju Zi (Hoveniae dulcis semen)	Chaingen	Japanese Raisin Tree	Rhamnaceae	T	Seed	Liver disease, Antimicrobial	Fever, scurvy
10.	<i>Inula japonica</i> Thunb.	Xuan Fu Hua (Inulae flos)	Layak	Inula	Asteraceae	H	Flower	Cough	Carminative
11.	<i>Lepidium apetalum</i> Wild.	Ting Li Zi (Lepidii semen)	Haliyan	Pepper weed	Brassicaceae	H	Seed	Edema, Cough	Carminative, stomachache
12.	<i>Lonicera japonica</i> Thunb	Jin Yin Hua (Lonicerae japonicae flos )	Nagar ball	Honeysuckle	Caprifoliaceae	S	Flower	Fever	Influenza, fever
13.	<i>Morus alba</i> L.	Sang Bai Pi (Mori cortex)	Shat Toot	White Mulberry	Moraceae	T	Root	Asthma	Worm killer, sore throat
		Sang Ye (Mori folium)	Shat Toot	White Mulberry	Moraceae	T	Leaf	Asthma	Worm killer, Cough
14.	<i>Peucedanum ferulaefolium</i> Gilli	Qian Hu (Peucedani radix)	Jangli Soya	Peucedanum	Apiaceae	H	Root	Cough, pneumonia	Carminative
15.	<i>Tussilago farfara</i> L.	Kuan Dong Hua (Farfrae flos )	Tarakhari	Coltsfoot	Asteraceae	H	Flower	Cough, Asthma	Influenza, cough,



*Aster tataricus* Linnaeus f.  
(Zi Wan, Asteris radix et rhizoma)



*Bupleurum scorzonerifolium*  
Willd  
(Chai Hu, Radix bupleuri)



*Chrysanthemum coronarium* L.  
(L.) J.Smith (Ju Hua, Chrysanthemum flos)



*Cibotium barometz*  
(Gou Ji, Cibotium Rhizoma)



*Eriobotrya japonica* (Thunb.)Lindl.  
(Pi Pa Ye, Eriobotryae follium)



*Erigeron breviscapus* (Vant.) Hand-Mazz.  
(Deng Zhan hua, Erigeron breviscapuse)

**Fig.1: Field images of TCM based local investigated flora effective against COVID-19**



*Euphorbia helioscopia* L.  
(Ze Qi, Euphorbiae helioscopiae herba)



*Fagopyrum tataricum* (L.) Gaertner  
(Jin Qiao Mai, Rhizoma fagopyri cymosi)



*Hovenia dulcis* Thunberg  
(Zhi Ju Zi, Hoveniae dulcis semen)



*Inula japonica* Thunb.  
(Xuan Fu Hua, Inulae flos)



*Lonicera japonica* Thunb  
(Jin Yin Hua, Lonicerae japonicae flos)



*epidium apetalum* Wild.  
(Ting Li Zi, Lepdi semen)

Fig.1: (Cont'd).



*Morus alba L.*  
(Sang Bai Pi, Mori cortex)



*Morus alba L.*  
(Sang Ye, Mori folium)



*Peucedanum ferulaefolium Gilli*  
(Qian Hu, Peducedani radix)



*Tussilago farfara L.*  
(Kuan Dong Hua, Farfrae flos)

Fig.1: (Cont'd).

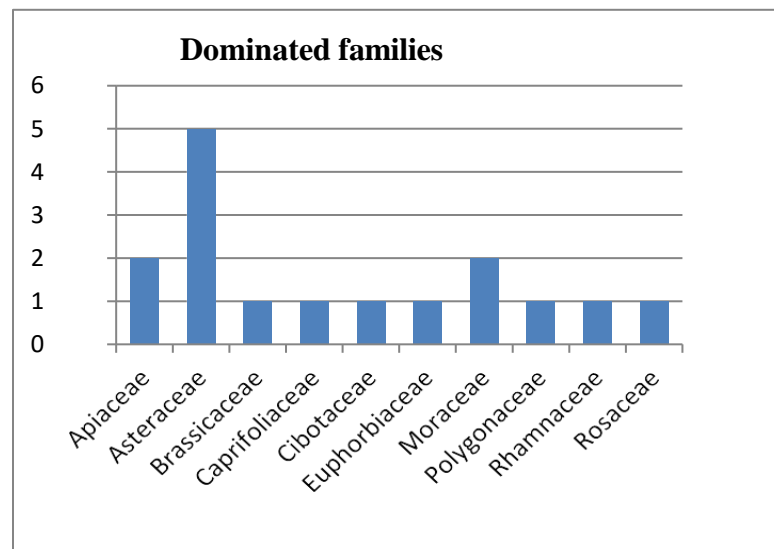
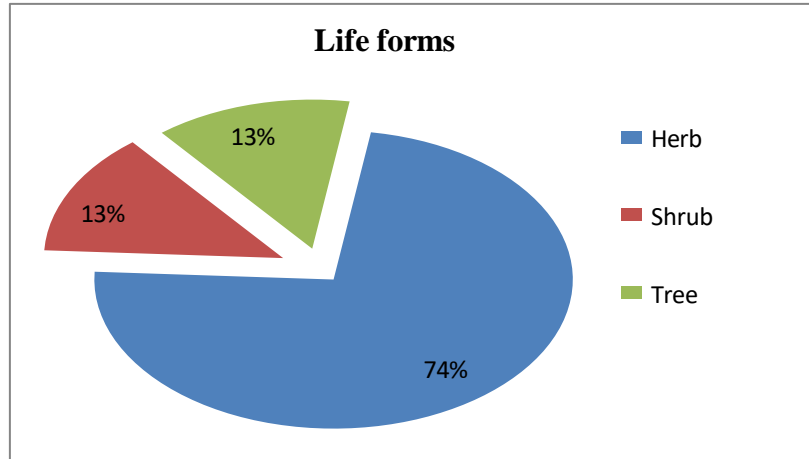
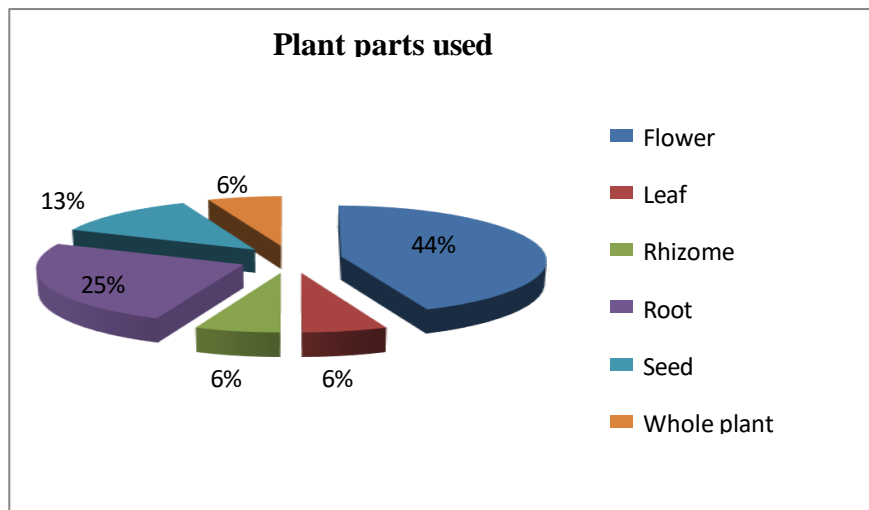


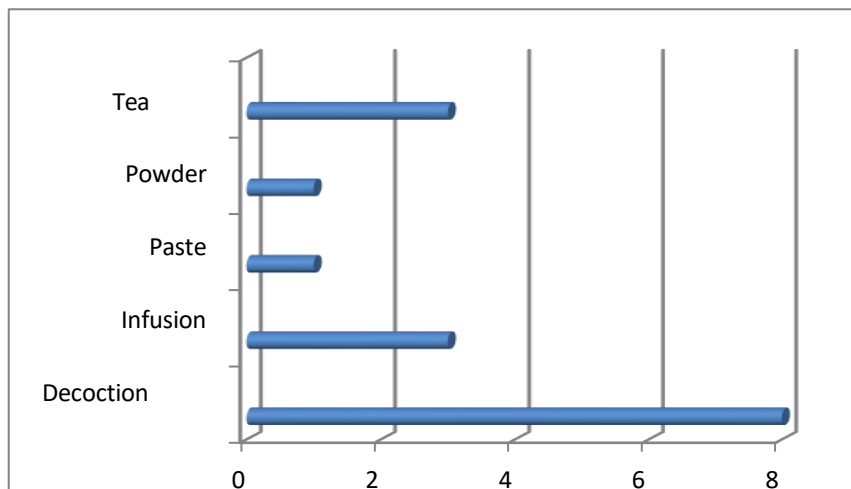
Fig.2: Family wise distribution of AJK flora inhabiting COVID-19



**Fig.3: Plant habit of AJK flora effective against COVID-19**



**Fig.4: Part wise usage of plant investigated against COVID-19**



**Fig.5: Mode of utilization of reported flora combating COVID-19**



## CONCLUSION

This study provides documentation of local medicinal flora which is effective against COVID-19 in light of Chinese-published paper. Local traditional usage of each plant species is recorded. Investigation revealed that documented plants are used for the treatment of various ailments in the Poonch Area of Azad Kashmir 15 local plants were found to be active against common diseases. Common use is cough treatment and antipyretic activity. TCM literature also supports the antiviral and antipyretic effects of documented plants. A common habit is an herb while a common part used is a flower. It is the first report that identifies medicinal plant usage against COVID-19. It will open the door for all stakeholders concerned with medicinal plant research and can prove milestones for drug discovery and integrated health systems in countries like China. The findings of the present study disclose the secret facts of local medicinal plants and provide a

## DECLARATION

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