

Medicinal Plants Used in the Traditional Chinese Medicine Growing on Fallow Lands in the South Agricultural Zone of the Amure Region, Russia

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Abstract

There was more than 1 million hectares of arable lands in the Amur region of Russia that were released from agriculture during the 1990-s. It is a serious national economic problem. The aim of the current research is to study the species composition of herbaceous plants growing on the fallow lands and to analyze their efficiency in the Chinese traditional medicine. It is well-known that the Chinese medicine utilize simultaneously the latest medications of the West along with collections of medicinal plants and potions. That is why there is always an interest from the Chinese side for harvesting different herbaceous raw materials. The Amur region is the border region with China where the pace of economic and international collaboration is being drastically accelerating. It opens new perspectives for joint study of new opportunities of arable land development. There have been lands studied not been affected by fires within the last 10-15 years in the south agricultural zone of the Amur region. The arable lands have been studied during the whole vegetation period which allowed to study the dynamics of growing plants on these lands, the change of aspects and complete herbaceous specious composition. It has been determined that within this period phytocenosis of forest-steppe vegetations have been formed diversely represented by species composition. Due to the seasonal dynamics of the region there have been more than 180 plant species found growing on these fallow lands (mostly herbaceous). The analysis of scientific references and internet sources has shown that nine of these species are listed in the officinal registry of medicinal plants of the Russian Federation, more than eighty species can be utilized as pharmaceutical plants, and sixty-three species are used in the traditional medicine of China.

Keywords: fallow lands, resources, pharmaceutical drugs, official medicine, traditional medicine, scientific Chinese medicine.

INTRODUCTION

Agricultural lands become fallow lands after three years of stopping their cultivation. According to the data of the Ministry of Agriculture of the Russian Federation, in 1988 the total surface of uncultivated agricultural lands was 5.1 mln. ha, while in 2006 this number has increased up to 54.4 mln. ha – it is 33 % of the total square of country's agricultural lands. This represents a serious issue for the national economy [10]. In the Amur Region of Russia there were more than 1 mln. ha of arable lands that have been released out of the agriculture during the 1990s. While in 1990 there was around 1623 thousand hectares have been cultivated, in 2000 – only 635 thousand hectares [8].

It is believed, that only useless weeds are growing on “set aside” agricultural lands and that appearing eco-systems do not have any resource of biospheric value. In fact, when an arable land is being abandoned, herbaous communities (meadows) substitute them – that can be utilised for hay making or green forage (forage resources).

D.I. Lyri defines these types of plants as inner-agricultural substitutive resources of the type 1. Besides, substitutive resources of type 2 are being formed – the resources of medicinal plants, hunting, and gathering [4].

Medicinal plants are species containing biologically active substances, positively influencing animals and humans and also used for medicinal vegetation raw material production. Medicinal plants, that are officially authorized by designated institutions, have been identified as “officinal” or “pharmaceutical”. There are more then 300 different pharmaceutical plants utilized in Russia [1]. These plants are collected and used in medicines production. There are 81 species out of these plants that are represented in the flora of the Far East of Russia [2].

Nowadays the economic cooperation between Russia and the People`s Republic of China is rapidly increasing. As the Amur Region is a bordering region with China, the international cooperation between these two countries in efficient use of fallow lands could have promising perspectives, and not only for production of traditional agricultural crops as soy and wheat.

It is well-known, that modern Chinese medicine is a synthesis of traditional (ancient) medicine and modern scientific (Western) medicine. In this country there is a unique matrix of medicinal treatment - simultaneous use of latest medicines of the Western medicine alone with plant collection and preparing potions [8]. The interest to various plant raw material production is always actual.

The aim of the current research is to study the species composition of herbaceous plants composition, growing on the arable lands that have been released out of the agricultural production with the following analysis of their potential utilization in the traditional medicine of China.

THE METHOD OF THE RESEARCH

Field studies have been conducted in the period from 2000 till 2016 years in Arhara and Blagoveschensk districts, located in the Amur Region of Russia (south agricultural

zone). Fallow lands, that have not been affected by fires for the 10-15 years in the period of their existence, have been studied. The pyrogenic factor has played a significant role in choosing fallow lands for the research, as species composition of fallow lands' plant communities after being burned out is noticeably decreasing for a long period of time [5]. Each fallow land has been studied for several years and each time during the whole vegetation period. This method helped us to identify the dynamic of fallow land vegetating process, to find out aspects change, and to register the complete species composition of plant communities. 10 fallow lands, with an area from 4 till 10 ha, have been studied. Botanical classification has been established according to the data mostly suitable for the region [3]. The potential of plants' use in the traditional Chinese medicine has been determined based on the literature and Internet sources [3].

RESULTS AND DISCUSSION

There have been more than 180 plant species (mostly herbaceous) found of the studied fallow lands considering the seasonal dynamic of the region [6]. The analysis of the scientific literature and Internet sources has contributed to determine that 9 plant species are officially registered as pharmaceutical plants of Russia and mentioned in the state pharmacopoei. More than 80 species are used in Russian traditional medicine, and 60 – in Chinese traditional medicine (Table 1).

Table 1. Medicinal plants growing on the territory of Amur region in Russia and used in the traditional medicine of China

Latin name of the plant	Use in the traditional medicine of China
<i>Astragalus membranaceus</i> (Fisch.) Bunge	Used in gerontology
<i>Adenophora gmelinii</i> (Spreng.) Fisch.) <i>A. tricuspidata</i> (Fisch. ex Schult.) A. DC	Potion is used to cure rheumatism, arthralgia, epilepsy, atherosclerosis, as febrifuge and restorative aid.
<i>Allium anisopodium</i> Ledeb.	Used for healing gastroenteritis, bronchitis, amenorrhea, diarrhoea, neurasthenia, as anti-helminthic treatment.
<i>Bupleurum scorzonifolium</i> Willd.	Root of this plant is used for lever disease.
<i>Chamaenerion angustifolium</i> (L.) Holub	Used as painkiller and sleeping aid.
<i>Clematis manshurica</i> Rupr. <i>Clematis hexpetala</i> Pall.	Roots' potion is used as painkiller.
<i>Commelina communis</i> L.	Used as potion for acute febrile illnesses.
<i>Convolvulus arvensis</i> L.	Used to treat tuberculosis.

Latin name of the plant	Use in the traditional medicine of China
<i>Crepis tectorum</i> L.	Used for bronchitis, pneumonia, atherosclerosis and as anti-nausea aid. An herb infusion is ingested for tuberculosis of bones, gastralgia, bruising, nervous system disfunction, as a laxative aid.
<i>Cuscuta japonica</i> Choisy	Seed potion is recommended for treating leprosy, also a tuberculoid leprosy.
<i>Delphinium grandiflorum</i> L.	Used for gastro-intestinal diseases.
<i>Dianthus chinensis</i> L.	Potions are used to treat various gynecological diseases.
<i>Dictamnus dasycarpus</i> Turcz.	Bark potion is used for leprosy, psoriasis, jaundice, epilepsy.
<i>Draba nemorosa</i> L.	Herb potion is used as a diuretic.
<i>Dracocephalum argunense</i> Fisch. ex Link	Used for ulcer.
<i>Elytrigia repens</i> (L.) Nevski	Roots are used as regulators of water-salty balance.
<i>Echinochloa crusgalli</i> (L.) Beauv.	Seeds, sprouts and roots of the plant (their potions) are used as a toning, blood clotting, and as a strengthening aid.
<i>Frageria Irientalis</i> Losink.	Used as an expectorant aid.
<i>Gentiana macrophulla</i> Pall.	Herb potion is used for respiratory tract diseases.
<i>Geranium davricum</i> DC. <i>G. vlassovianum</i> Fisch. ex Link <i>G. sibiricum</i> L.	Used for eye diseases.
<i>Geum aleppicum</i> Jacq.	Roots are used as a sedative aid for people with increased heart rate.
<i>Hemerocallis minor</i> Mill.	Use as a toning heart and wound healing aid.
<i>Heracium umbellatum</i> L.	Herb is used to treat rabies and headache.
<i>Heteropappus hispidus</i> (Thunb.) Lees.	Root powder is used for abscess and poisonous insects' bites.

Latin name of the plant	Use in the traditional medicine of China
<i>Hypericum attenuatum</i> Choisy	Used for headaches.
<i>Leonurus japonicus</i> Houtt.	Used as blood clotting.
<i>Lepidium densiflorum</i> Schrad.	Herb potion is used for fever, malaria, and as a febrifuge.
<i>Lilium dahurikum</i> Ker.-Gawl. <i>L. pensylvanicum</i> Ker.-Gawl.	Bulbs and flowers of this plant are applied externally for ulcer and abscess.
<i>Lycopus lucidus</i> Turcz. ex Benth.	Herb and roots' potion is used as a diuretic for swellings; also, is used for disorders of menstrual function and furunculus.
<i>Lysimachia davurica</i> Ledeb. <i>L. barystachys</i> Bunge	Used for stomach problem, gastritis, colitis, enterocolitis, diarrhoea.
<i>Moehringia lateriflora</i> (L.) Fenzl	The herb is used for bone diseases and bone marrow.
<i>Orobanche coerulescens</i> Steph.	The potion of and aboveground part of the plant are applied as a toning and strengthening aid.
<i>Orostachys malacophylla</i> (Pall.) Fisch.	Used for kidney diseases.
<i>Paeonia lactiflora</i> Pall.	Medications made from this plant are known as the most used in the traditional medicine of China.
<i>Patrinia scabiosifolia</i> Fisch. ex Link et DC. <i>P. rupestris</i> (Pall.) DuRoi	Used as a valerian alternative.
<i>Platycodon grandiflorus</i> (Jacq.) A. DC.	Roots are used for skin diseases and chickenpox.
<i>Polygonatum odoratum</i> (Mill.) Druce	Roots are used as strengthening and apoptogenic aid.
<i>Potentilla anserina</i> L. <i>P. longifolia</i> Willd.ex Schlecht.	Potion of roots and flowers of this plant are used for gastrointestinal diseases, lungs tuberculosis and atherosclerosis.
<i>Pulsatilla cernua</i> (Thunb.) Bercht. et Presl	Potion is used as an anti-inflammatory and blood clotting.
<i>Rhaponticum uniflorum</i> (L.) DC.	Herb potion regulates metabolic processes and can also be used as a wound healing aid.

Latin name of the plant	Use in the traditional medicine of China
<i>Saposhnikovia divaricata</i> (Turcz.) Schischk.	Fruit infusion and herb potion are used for chronic gastroenteric.
<i>Sedun aizoon</i> L.	Root potion is used for dysentery.
<i>Scorzonera radiata</i> Fisch. ex Ledeb.	Roots are used for gastritis and as a febrifugal aid.
<i>Scutellaria baicalensis</i> Georgi	Used in herb collections, inhibiting prostate cancer growth.
<i>Sphallerocarpus gracilis</i> (Bess. ex Trev.) K. Pol.	Roots are used for sarcoma.
<i>Spiraea salicifolia</i> L.	Infusion and potion are used for diarrhea.
<i>Synurus deltoides</i> (Ait.) Nakai	The plant has an anti-inflammatory, diuretic and painkilling affect. Used for joints and stomach diseases.
<i>Taraxacum mongolicum</i> Hand.-Mazz.	Used for urinary tract infections, painful urination.
<i>Trifolium arvense</i> L. <i>T. pratense</i> L.	Used in dermatology.
<i>Trollius ledeborii</i> Reichenb.	Herb is used for retinitis.
<i>Thesium chinense</i> Turcz.	Aboveground parts of the plant are used to cure tumors.
<i>Veronica longifolia</i> L. <i>V. longifolia</i> L.	Used as a febrifugal, blood clotting and wound-healing aid, for gastroenteritis, endometritis and hepatitis.
<i>Viola mandshurica</i> W. Beck.	Aboveground part is used for lungs and lymph node tuberculosis.
<i>Xanthium sibiricum</i> Patr. ex Willd.	Used for thyroid deficiency.

The study has determined, that most of the medicinal plants are grown on the fallow lands as single plants and not very abounded [6]. However, the fact that these species are inhabiting these areas proves the favorable soil-climate conditions for their growth on these lands.

CONCLUSION

The fallow lands of the Amur region of Russia in areas that have not been affected by fires, are becoming habitats for medicinal plants that are agricultural substitutive resources of type 2 and can be used not only in the official, but also in traditional pharmacopeia of Russia. Also, they can represent a great interest for the traditional medicine of China. There have been 63 plant species found on these lands, which proves their favorable soil-climate conditions for their growth. Consequently, when these lands get back to the agricultural production of the Amur region, they can be used with a perspective for medicinal plants cultivation for markets of Russia and China.

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