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O‘ZBEKISTONDA SHUVOQ (*ARTEMISIA* L.)NING DORIVOR TURLARIDA PARAZITLIK QILUVCHI *PUCCINIA* TURLARI

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Maqolada O‘zbekistondagi shuvoq (Artemisia L.)ning dorivor turlarida parazitlik qiluvchi Puccinia Pers. turkumi ayrim turlari haqida ma’lumotlar keltirilgan. Mikologik tadqiqot natijalariga ko‘ra, shuvoqning 15 turida Puccinia zamburug‘larining 7 ta turi (P. absinthii DC., P. artemisiicola P. Syd. & Syd., P. chrysanthemi Roze, P. cinae Tranzschel & Kuprev., P. conferta Dietel & Holw., P. dracunculina Fahrend va P. universalis Arthur) uchrashi ma’lum bo‘ldi. Shuvoqning eng ko‘p zararlangan turlari Artemisia absinthium, A. tenuisecta va A. dracunculus ekanligi aniqlandi. Shuningdek, Puccinia turlarining O‘zbekiston viloyatlari bo‘yicha tarqalishi tahlili, morfologik tavsifi va konspekti keltirilgan.

Kalit so‘zlar: *Asteraceae, Pucciniaceae, tarqalishi, xo‘jayin o‘simliklar, taksonomik tahlil*.

В статье представлены сведения о некоторых видах рода Puccinia Pers., паразитирующих в лекарственных видах полыни (Artemisia L.) Узбекистана. По результатам микологического исследования у 15 видов полыни обнаружено 7 видов Puccinia (P. absinthii DC., P. artemisiicola P. Syd. & Syd., P. chrysanthemi Roze, P. cinae Tranzschel & Kuprev., P. conferta Dietel & Holw., P. dracunculina Fahrend и P. universalis Arthur). Определено, что наиболее пораженными видами полыни являются: Artemisia absinthium, A. tenuisecta и A. dracunculus. Также приведен анализ распространения по регионам Узбекистана, морфологическая характеристика и краткий обзор видов Puccinia.

Ключевые слова: *Asteraceae, Pucciniaceae, распространение, растения-хозяева, таксономический анализ*.

Kirish

Asteraceae oilasi yer yuzining barcha qismida tarqalgan bo‘lib, 1300 ga yaqin turkum, 25000 dan ortiq turni o‘z ichiga oladi. O‘rta Osiyoda mazkur oila vakillarining 179 ta turkum, 1460 dan ortiq turi uchrashi qayd etilgan. Shuningdek, respublikamizda 121 turkumga mansub 560 ta turi uchrashi haqida ma’lumotlar berilgan [8]. Bu oilaning keng tarqalgan turkumlaridan biri *Artemisia* bo‘lib, asosan dunyoning shimoliy yarimsharida, qisman janubiy yarimsharida uchraydi [26]. Shuvoqning ba’zi turlaridan oziq-ovqat va farmatsevtika sanoatida foydalaniladi [29]. Masalan, *A. annu* o‘simligida efir moyi, C va K vitaminlari bo‘lib, tibbiyotda keng qo‘llaniladi [46]. Shuningdek, ushbu turning yer ustki qismi gijja haydovchi dori sifatida foydalanilishi aniqlangan [46]. Bundan tashqari, shuvoq turlari ko‘krak bezi saratoni [44], ovqat hazm qilish muammolari [27], isitma [54] hamda epilepsiyaga qarshi dori sifatida qo‘llaniladi [4]. Shuvoqlarning dorivorlik xususiyatlari O‘zbekistonda ularga katta ehtiyoj borligini ko‘satadi. Shuningdek, bu o‘simliklar respublikamizning bir nechta Farm sanoatlarida yetishtiriladi. Shu sababli ushbu dorivor o‘simliklarning mikobiotasini o‘rganish va keng tarqalgan patogen zamburug‘ turlarini aniqlash, ularga qarshi kurash choralarini ishlab chiqish zarur hisoblanadi.

Zang zamburug‘lari shuvoq o‘simliklarida keng tarqalgan parazit zamburug‘lardan bo‘lib, asosan *Puccinia* turkumiga mansub turlardir. Bu turkum vakillari Pucciniaceae oilasining eng katta jamoasi bo‘lib, yer yuzining barcha qismida tarqalgan. Ushbu turkum vakillari juda ko‘p dorivor, qishloq xo‘jaligi va boshqa foydali o‘simliklarda uchrab, zang kasalligini keltirib chiqaradi. Ayniqsa, iqtisodiy ahamiyatga ega bug‘doyda *P. striiformis* Westend., *P. triticina* Eriks. va *P. graminis* turlari zang kasalligini keltirib chiqarishi natijasida hosilning juda ko‘p qismini nobud qilib, davlatga iqtisodiy zarar keltiradi. Shuningdek, *Puccinia* turlari ko‘pgina dorivor o‘simliklarda tarqalgan bo‘lib, shulardan biri Asteraceae oilasiga mansub *Artemisia* turkumidir. Ushbu o‘simlik turkumida bir nechta *Puccinia* turlari tarqalib, ularni zararlaydi [9]. Britaniyada *Artemisia* turkumida 4 ta *Puccinia* turi uchrashi haqidagi ma’lumotlar keltirilgan [30]. Qozog‘istonlik olimlar Oqmo‘la viloyatida tarqalgan *A. taurica* L., *A. cina* O., *A. campestris* L., *A. dracunculus* L. turlarida *P. absinthii* turining tez-tez uchrashini aniqlashgan [28]. Turkiya davlatida esa *Artemisia* turkumi o‘simliklarida 5 ta *Puccinia* turi uchrashi haqida ma’lumotlar berilgan [53]. Yapon olimlari *Artemisia* turlarida *P. dioicae* var. *micropuncta* Y. Ono,

P. ferruginosa P. Syd. & Syd. va *P. artemisiae-keiskeanae* Miura zamburug‘lari parazitlik qilishini aniqlaganlar [45].

O‘zbekistonda tarqalgan yuksak o‘simliklarda uchraydigan zang zamburug‘lar to‘g‘risidagi dastlabki ma’lumotlar Zaprometov va Golovinlarning ishlarida keltirilgan [12, 13, 14, 15]. Keyinchalik O‘zbekiston yuksak o‘simliklarining mikrobiotasiga bag‘ishlangan ilmiy ishlarni Panfilova va Gaponenko [17], Baymuratova [11], Arifxonova [1] va boshqa olimlar olib borganlar. Shuningdek, 1990-yillardan O‘zbekiston Respublikasi Botanika institutining bir qancha mikolog olimlari tomonidan yuksak o‘simliklarning zamburug‘lari bo‘yicha ilmiy ma’lumotlar keltirilgan [20, 21, 22, 23, 24, 25, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43]. Jumladan, respublikamizda tarqalgan *Artemisia* turkumi o‘simliklarida uchraydigan *Puccinia* turlari bo‘yicha dastlabki ma’lumotlarni 1950-yillarda Lebedeva tomonidan tog‘li mintaqalarda olib borilgan mikologik tadqiqotlarda ko‘rish mumkin. Muallif *A. persica* Boiss. o‘simligida *P. absinthii* zamburug‘i uchrashini qayd etgan [16]. Keyinchalik, 1960-yillarda Ahmedova tomonidan Janubi-g‘arbiy Tyan-Shan mikoflorasini o‘rganish bo‘yicha olib borilgan tadqiqotlari natijasida *A. absinthium*, *A. dracunculus*, *A. vulgaris* o‘simliklarida *P. absinthii* zang zamburug‘i uchrashi haqida ma’lumot bergan [10]. 1980-yillarda Saliyeva Surxondaryo viloyatidagi ilmiy ishlari davomida *A. dracunculus* o‘simligida *P. absinthii* zamburug‘i uchrashi haqida ma’lumotlar keltirilgan [18]. Shuningdek, O‘zR FA Botanika instituti olimlari tomonidan 2000-yildan hozirgi vaqtgacha olib borilgan tadqiqotlarda shuvoq o‘simliklarida zang zamburug‘larining uchrashi haqida ma’lumotlar keltirilgan. Namangan, Jizzah va Toshkent viloyatlarida olib borilgan ilmiy ishlarda *Artemisia* turkumining 6 turida *Puccinia* ning 5 turi uchrashi aniqlangan [2, 47, 48, 49, 50, 51, 52, 55]. Zomin Milliy bog‘ida *A. juncea* Kar. & Kir. da *P. conferta* aniqlangan [5], Ortiqovning Jizzax viloyatida olib borgan ilmiy ishlarida *Artemisia* turkumining 5 turida *Puccinia* ning 3 turi uchrashi to‘g‘risida ma’lumotlar keltirilgan [7].

Yuqoridagi ma’lumotlarni o‘rganish va tahlil qilish natijasida yuksak o‘simliklarda, jumladan, shuvoq o‘simliklarida tarqalgan zang zamburug‘lari bo‘yicha respublikamizda ma’lumotlarning to‘liq emasligi, *Puccinia* turlari bilan shuvoqning qaysi turlari zararlanishi to‘g‘risidagi ma’lumotlar yetarli emasligi va *Puccinia* turlarining ro‘yxati mavjud emasligi ma’lum bo‘ldi. Buni hisobga olgan holda, zang zamburug‘larining respublikamizdagi yuksak o‘simliklarda tarqalishini o‘rganish va konspektini shakllantirish bo‘yicha ilmiy ishlar olib borilmoqda. Bizning ilmiy ishimiz shimoli-sharqiy O‘zbekistonning yuksak o‘simliklarida tarqalgan *Puccinia* turlarini aniqlash va o‘rganishni o‘z ichiga oladi.

Tadqiqot obyekti va metodlari

Mikologik ekspeditsiyalar O‘zbekistonning shimoli-sharqiy viloyatlarining shuvoq tarqalgan joylarida olib borildi. *Artemisia* turkumida uchraydigan zang zamburug‘lari bilan zararlangan o‘simliklarni yig‘ishda marshrutli hamda monitoring usullaridan foydalanildi.

Tadqiqot uchun O‘zbekistonda tarqalgan *Artemisia* turkumi o‘simliklarida uchraydigan *Puccinia* turlari obyekt bo‘lib xizmat qildi. Ekspeditsiyalar davomida, yig‘ilgan gerbariy namunlarining terib olingan vaqti va joyi belgilab borildi. Zang zamburug‘larining tur tarkibini aniqlashda, ilmiy maqolalar va aniqlagichlardan foydalanildi. *Puccinia* zamburug‘i bilan zararlangan o‘simlik gerbariylari O‘zR FA Botanika institutining Mikologiya laboratoriyasida tahlil qilindi. Shuningdek, Toshkent mikologiya gerbariysi (TASM) fondida saqlanayotgan gerbariy materiallari qayta tekshirildi. Morfologik tekshirish ishlarini olib borishda 300M (HDCE-X5) va N-MBI-15 rusumli biolam va trinokulyar mikroskoplaridan foydalanildi. O‘rganilgan zamburug‘larning zamonaviy sistematik nomenklaturasi indexfungorum.org (Index Fungorum.) [56] va xo‘jayin o‘simlik nomlari powo.science.kew.org (Kew Science Plants of the World online.) [57] bazalari asosida berildi.

Tadqiqot natijalari va ularning tahlili

Ilmiy adabiyotlarni o‘rganish, olib borilgan dala tadqiqotlari davomida yig‘ilgan namunalarni taksonomik tahlil qilish hamda Toshkent mikologiya gerbariysi (TASM) fondida saqlanayotgan *Puccinia* turlari namunalarini morfologik qayta tekshirish natijasida O‘zbekistonda tarqalgan *Artemisia* turkumining 15 ta turida *Puccinia* ning 7 ta turi (*P. absinthii*, *P. artemisiicola*, *P. chrysanthemi*, *P. cinae*, *P. conferta*, *P. dracunculina* va *P. Universalis*) ichrashi aniqlandi (1-jadval). *Puccinia* turlarining o‘simliklarda tarqalishi tahlil qilinganda, ko‘p uchrashi hamda zararlashi bo‘yicha *P. absinthii* turi 42,3 % ni, *P. chrysanthemi* 15,5 % ni,

P. cinae va *P*. *conferta* zamburug‘lari har biri 11,5 % dan ko‘rstgichni tashkil etdi. Kam darajadagi ko‘rsatkich *P. universalis* (3,8 %), *P*. *artemisiicola* va *P*. *dracunculina* (7,7 %) turlariga tegishli ekanligi kuzatildi (1-diagramma).

Tadqiqot davomida dorivor shuvoq o‘simliklarini zararlovchi *Puccinia* turlarining O‘zbekiston viloyatlari bo‘yicha tarqalishi ilk bor tahlil qilindi. Bunga ko‘ra, O‘zbekiston viloyatlarida tarqalgan *Artemisia* o‘simliklarida *Puccinia* turkumining eng ko‘p turlari Namangan, Jizzax va Samarqand viloyatlarida (5 ta), Toshkent viloyatida (2 ta) va eng kam Farg‘ona, Buxoro, Surxondaryo, Sirdaryo viloyatlarida (1 ta) uchrashi aniqlandi (2-diagramma). Shuningdek, O‘zbekistonda shuvoq o‘simliklarida *Puccinia* zamburug‘larining tarqalish darajasi o‘rganilganida, Jizzax viloyatida eng ko‘p (11 marta) ko‘rsatkich kuzatildi, keyingi viloyatlar esa Namangan (10 marta), Samarqand (8 marta) va Toshkent (7 marta) viloyatlari ekanligi aniqlandi. Aksincha, eng kam qayd etilish darajasi Farg‘ona (4 marta), Buxoro (2 marta), Sirdaryo va Surxondaryo (har birida bir marta) viloyatlarida kuzatildi (2-jadval). *Artemisia* o‘simliklarida tarqalgan *Puccinia* turlarining viloyatlar miqiyosida tarqalishi foiz ko‘rsatkichi bo‘yicha eng ko‘p Jizzaxda 25 % ni, Namanganda 23 % ni, Samarqandda 18 % ni va Toshkentda 16 % ni tashkil etishi kuzatilgan bo‘lsa, past ko‘rsatkichlar Farg‘onada 9 % ni, Buxoroda 5 % ni tashkil etdi. Sirdaryo va Surxondaryoda uchrash darajasi eng past – 2 % ekanligi aniqlandi (3-diagramma). Olib borgan tadqiqotlarimizga ko‘ra, *A. dracunculus* turi *Puccinia* ning 4 ta turi bilan, *A. absinthium* va *A. tenuisecta* turlari 3 tadan, *A. diffusa*, *A. persica, A. vulgaris* turlari 2 tadan hamda *A. annua*, *A. eriocarpa*, *A. ferganensis*, *A. leucodes, A. juncea A. turanica*, *A. serotina* va *A. tournefortiana* turlari faqat bittadan *Puccinia* turi bilan zararlanishi kuzatildi (4-diagramma).

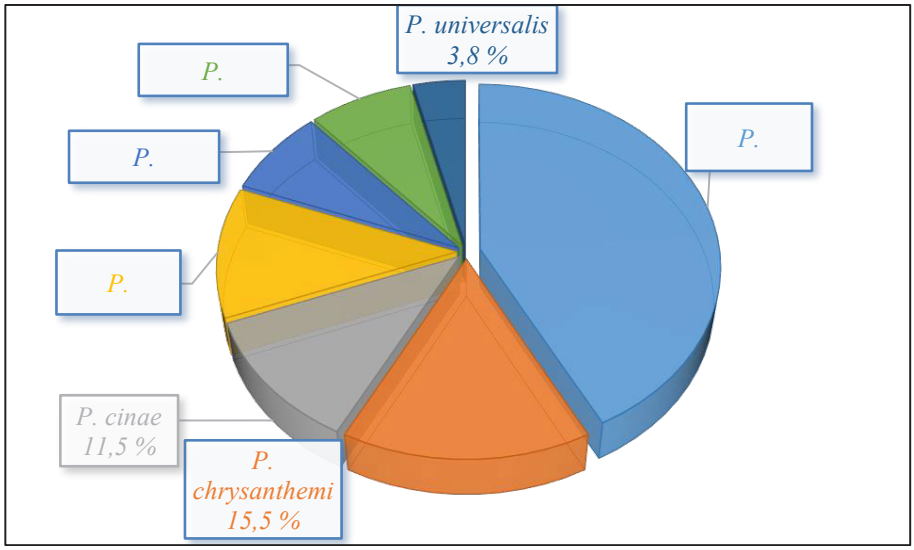
Mikologik kuzatishlar jarayonida *Puccinia absinthii* turi shuvoq turkumining hamma vakillarida uchrab, deyarli hamma viloyatlarda shuvoqlarni ko‘plab zararlashi kuzatildi (1-rasm). Toshkent viloyatida *A. absinthium* o‘simligida *P*. *absinthii* turining uchrashi birinchi bor qayd etildi (1-rasm).

1-jadval

Artemisia turkumi o‘simliklarida tarqalgan _Puccinia_ turlari

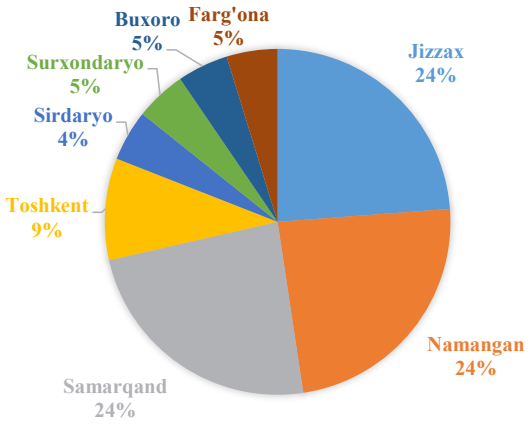
Tur	Xo‘jayin o‘simlik	O‘simlik soni	Zamburug‘ aniqlangan hudud
Puccinia absinthii	*Artemisia absinthium* L.	11	Namangan
			Farg‘ona
			Toshkent
			Toshkent
			Farg‘ona
			Samarqand
	Artemisia annua L.		Farg‘ona
	Artemisia diffusa Krasch. ex Poljakov.		Jizzax
	Artemisia dracunculus L.		Namangan
			Toshkent
			Surxondaryo
			Jizzax
	Artemisia eriocarpa Bunge.		Farg‘ona
			Buxoro
	Artemisia ferganensis Krasch.		Namangan
			Sirdaryo
			Samarqand
	Artemisia leucodes Schrenk.		Buxoro
	Artemisia persica Boiss.		Toshkent
	Artemisia tenuisecta Nevski.		Namangan
			Samarqand
	Artemisia vulgaris L.		Namangan
			Toshkent
			Samarqand
	Artemisia sp.		Toshkent

Puccinia artemisiicola	*Artemisia dracunculus* L.	2	Samarqand
	Artemisia tenuisecta Nevski.		Namangan
Puccinia chrysanthemi	*Artemisia absinthium* L.	4	Jizzax
	Artemisia diffusa Krasch. ex Poljakov.		
	Artemisia tournefortiana Rchb.		
	Artemisia sp.		
Puccinia cinae	*Artemisia persica* Boiss.	3	Toshkent
			Samarqand
			Jizzax
	Artemisia serotina Bunge.		Namangan
	Artemisia tenuisecta Nevski		
Puccinia conferta	*Artemisia juncea* Kar. & Kir.	3	Jizzax
	Artemisia turanica Krasch.		Samarqand
			Jizzax
	Artemisia vulgaris L.		Namangan
Puccinia dracunculina	*Artemisia absinthium* L.	2	Namangan
	Artemisia dracunculus L.		Namangan
			Jizzax
Puccinia universalis	*Artemisia dracunculus* L.	1	Samarqand



1-diagramma. *Artemisia* o‘simliklarida tarqalgan *Puccinia* turlarining uchrash darajasi (% hisobida).

1-diagramma ma’lumotlaridan ko‘rish mumkinki, o‘simliklarda *Puccinia* turlarining uchrashi tahlil qilinganda, *P. absinthii* turi eng ko‘p – 11 ta *Artemisia* o‘simlik turlarini zararlashi kuzatilgan bo‘lsa, qolgan *P. chrysanthemi* turi 4 ta, *P. cinae* va *P. conferta* turlari 3 ta, *P. artemisiicola* va *P. dracunculina* turlari 2 ta hamda *P. universalis* faqat bitta shuvoqda uchrab zararlayotgani kuzatildi.



2-diagramma. *Artemisia* o‘simliklarini zararlovchi *Puccinia* turlarining O‘zbekiston viloyatlari bo‘yicha tarqalish ko‘rsatkichi (% hisobida).

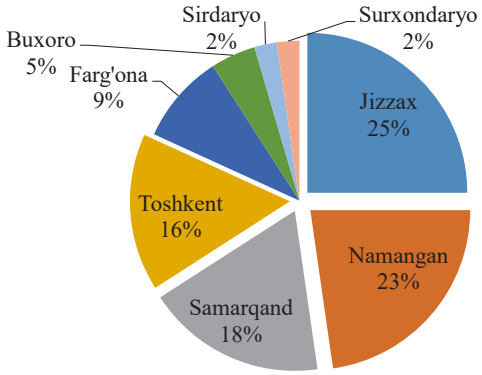
2-diagramma ma’lumotlari ko‘rsatib turibdiki, O‘zbekiston viloyatlarida tarqalgan *Artemisia* o‘simliklarini zararlayotgan *Puccinia* zamburug‘ turlari eng ko‘p Namangan, Jizzax va Samarqand viloyatlarida – 5 ta, Toshkent viloyatida qisman kam – 2 ta va eng kam Farg‘ona, Buxoro, Surxondaryo, Sirdaryo viloyatlarida – 1 ta tur uchrashi aniqlandi.

2-jadval

O‘zbekiston **viloyatlari bo‘yicha *Puccinia* turlarining tarqalish ko‘rsatkichi**

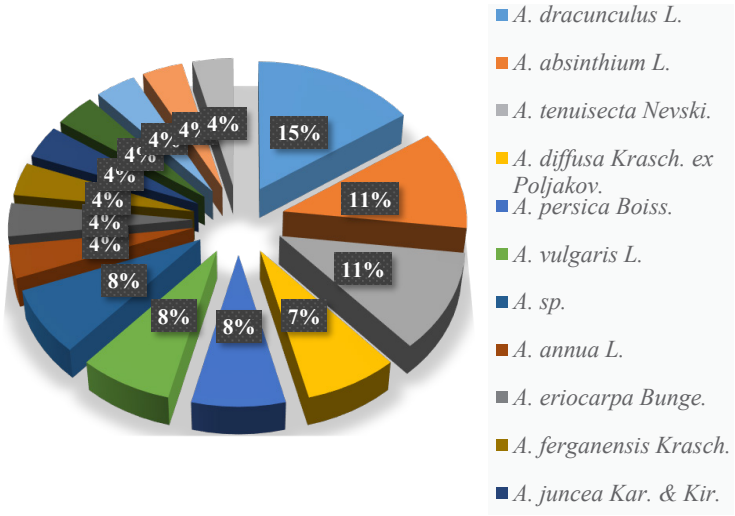
T/r	Viloyatlar	Sonda	% hisobida
1	Buxoro	2	4,5
2	Farg‘ona	4	9
3	Jizzax	11	25
4	Namangan	10	22,7
5	Samarqand	8	18,2
6	Sirdaryo	1	2,3
7	Surxondaryo	1	2,3
8	Toshkent	7	16
	Jami	**44**	**100 %**

2-jadval ma’lumotlariga ko‘ra, *Puccinia* turlarining respublikamiz viloyatlarida uchrashi bo‘yicha Jizzax va Namanganda eng yuqori, Samarqand, Toshkent va Farg‘ona viloyatlarida qisman kam, Buxoro, Sirdaryo va Surxondaryo viloyatlarida eng kam ko‘rsatkich qayd etilgan.



3-diagramma. *Artemisia* turkumi o‘simliklarida tarqalgan *Puccinia* turlarining O‘zbekiston viloyatlari bo‘yicha aniqlanganlik darajasi tahlili (% hisobida).

3-diagramma ma'lumotlaridan ko'rinib turibdiki, *Artemisia* turkumi o'simliklarini zararlovchi *Puccinia* turlari tarqalishining eng yuqori aniqlanganlik darajasi Jizzax viloyatiga (25 %), eng past aniqlanganlik darajasi esa Buxoro, Surxondaryo va Sirdaryo viloyatlariga (2 %) to'g'ri kelyapti.



4-diagramma. *Puccinia* turlarining shuvoq turlarida tarqalish ko'rsatkichi.

Mikologik tadqiqotlarimiz davomida *A. dracunculus* L. turi *Puccinia* turkumining eng ko'p 4 ta: *P. absinthii*, *P. artemisiicola*, *P. dracunculina* va *P. universalis* turlari bilan zararlanishi kuzatildi. Aksincha, *A. serotine*, *A. turanica*, *A. tournefortiana*, *A. leucodes*, *A. juncea*, *A. ferganensis*, *A. eriocarpa*, *A. annua* turlari faqatgina *Puccinia* turkumining bir turi bilan zararlangan.

Artemisia turkumida tarqalgan *Puccinia* turlarining konspekti

Artemisia turkumi vakillarida *Puccinia* turlarining tarqalishi ro'yxati alifbo tartibida berildi. Ba'zi qisqartmalardan foydalanildi. Quyidagi so'zlar qisqartirildi: *Artemisia* – *A*., Farg'ona viloyati – FV, Buxoro viloyati – BV, Jizzax viloyati – JV, Namangan viloyati – NV, Samarqand viloyati – SV, Sirdaryo viloyati – SirV, Surxondaryo viloyati – SurV, Toshkent viloyati – TV.

***1. Puccinia absinthii* DC.**

Tarqalishi: *A. absinthium* L. – NV: Uychi tumani, Qizilrovot qishlog'i, 11.05.2000 [2]; 59-o'rta maktab, 24.07.2000 [2]; Yangiqo'rg'on tumani, Nanay qishlog'i, 01.10.2001 [2]; 25.07.2002 [2]. SV: Kattaqo'rg'on, 1919 [9]; Jomboy tumani, 17.08.1955 [9]. FV: Farg'ona tumani, Shohimardon, 15.06.1949 [9]; So'x tumani, Demursad MFY, 29.06.2023 [51]; Qal'a MFY, 13.09.2023. TV: Bo'stonliq tumani, Oqtosh pastki adirliklari, 27.07.1938 [10]; Piskom tog'i, 01.10.1958 [10]; Yusufxona, 18.07.2023 [51].

A. annua L. – FV: 03.07.1948, Farg'ona tumani, Shohimardon, 03.07.1950 [9].

A. diffusa Krasch. ex Poljakov – JV: Zafarobod tumani, Chimqo'rg'on, 26.04.1959 [9].

A. dracunculus L. – JV: Zomin tumani, Guralash qo'riqxonasi, 31.06.1948 [9]. TV: Bo'stonliq tumani, Chimyon, 11.07.1928 [10]; Maydontol, 07.1955 [10]; Devonsoy, 07.1955 [10]. SurV: Hisor tizmasi, 07.1986 [18]. NV: Pop tumani, Sansoloqsoy bo'yida, 18.07.2000; Dubog' qishlog'i, 03.05.2002; o'sha joyda, 17.07.2002 [2].

A. eriocarpa Bunge – BV: Kogon tumani, Toshquduq, 10.1956 [9]; Beshxona, 08.10.1956 [9]. FV: Garchakov, 07.06.1949 [9].

A. ferganensis Krasch. – SV: Urgut tumani, 10.10.1957 [9]; SirV: Sardoba ko'li, 11.09.1959 [9]. NV: Uchqo'rg'on tumani, 4-bo'lim, 24.07.2000 [2]; Kosonsoy tumani, Qorasuv qishlog'i, 23.07.2002 [2].

A. leucodes Schrenk – BV: Qizilqum, 15.06.1936 [9].

A. persica Boiss. – TV: Parkent tumani, Boshqizilsoy, 09.1954; Ohangaron tumani, Abiyasoy, 06.10.1954; Bo'stonliq tumani, Maydontol, 1957, 29.07.1958 [9].

A. tenuisecta Nevcki. – SV: Urgut tumani, Omonqo'ton, Bul-bulzorsoy, 10.10.1957 [9]; Uchqo'rg'on tumani, 4-bo'lim, 27.07.2002 [2].

A. vulgaris L. – SV: Jomboy tumani, 26.04.1958 [9]. NV: Norin tumani, Norinkapa qishlog'i, 30.09.2001 [2], 28.07.2002 [2]; Mingbuloq tumani, Oqqum qishlog'i, 17.07.2000 [2], o'sha joyda, 23.11.2000 [2]; Alami qishlog'i, 03.05.2000 [2]. TV: Bo'stonliq tumani, Sidjak, 12.07.1957 [10].

A. sp., TV: Bo‘stonliq tumani, Maydontol, 28.07.1938 [10].

2. *Puccinia artemisiicola* P. Syd. & Syd.

Tarqalishi: *A. dracunculus* L. – SV: 1926 [9].

A. absinthium L. – JV: Zomin tumani, Zomin milliy tabiat bog‘i, Sharsharalisoy, 31.07.2018 [7].

A. tenuisecta Nevski. – TV: Pop tumani, Dubog‘ qishlog‘i, “Omon” dachasi atrofida, 29.09.2001 [2].

3. *Puccinia chrysanthemi* Roze 1900.

Tarqalishi: *A. absinthium* L. – JV: Zomin tumani, Zomin milliy tabiat bog‘i, 29.08.2018 [7].

A. diffusa Krasch. ex Poljakov. – JV: Zomin tumani, Usmonlisoy, 30.05.2019 [7].

A. tournefortiana Rchb. – JV: Zomin tumani, Sufa, 12.07.2019 [7].

A. sp. – JV: Zomin tumani, Qorong‘isoy qishlog‘i, 20.07.2022 [7].

4. *Puccinia cinae* Tranzschel & Kuprev.

Tarqalishi: *A. persica* Boiss. – SV: Jomboy tumani, 19.10.1957 [9]. JV: Zomin tumani, Guralash qo‘riqxonasi, 18.07.1947 [9]. TV: Bo‘stonliq tumani, Katta Chimyon, 06.07.1929 [10].

A. serotina Bunge – NV: Uchqo‘rg‘on tumani, 4-bo‘lim, 26.06.2001 [2].

A. tenuisecta Nevski – NV: To‘raqo‘rg‘on tumani, Kuymazor qishlog‘i, 30.04.2001 [2].

5. *Puccinia conferta Dietel & Holw.*

Tarqalishi: *A. juncea* Kar. & Kir. – JV: Zomin tumani, Nurota qo‘riqxonasi hududi, Majrumsoy, 19.07.2011 [5].

A. turanica Krasch. – SV: 14.05.1958 [9].

A. vulgaris L. – NV: Norin tumani, Norinkapa qishlog‘i, 28.05.2002 [2]; To‘raqo‘rg‘on tumani, Kuymazor qishlog‘i, 12.05.2002 [2]; Kosonsoy tumani, Qorasuv qishlog‘i, 26.05.2002 [2].

6. *Puccinia dracunculina* Fahrend.

Tarqalishi: *A. absinthiuum* L. – NV: Yangiqo‘rg‘on tumani, Nanay qishlog‘i, 29.04.2001 [2].

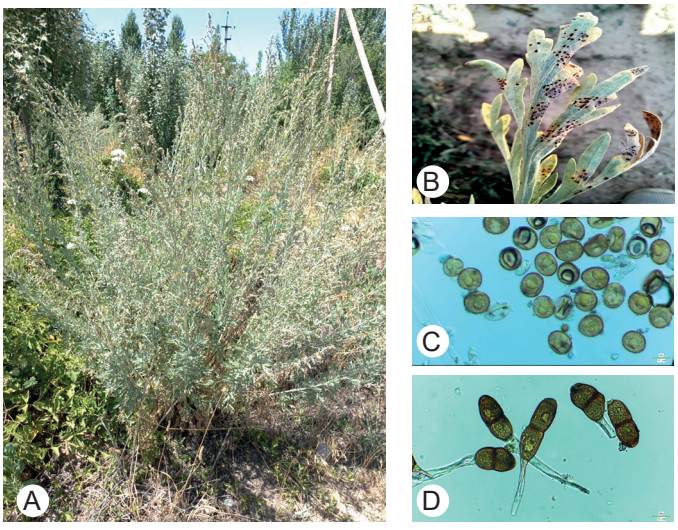
A. dracunculus L. – JV: Zomin tumani, Guralash qo‘riqxonasi, 31.06.1948 [9]; Irg‘aylisoy, 10.09.2022 [7]; Usmonlisoy, 12.09.2022 [7]. Pop tumani, Qandog‘on qishlog‘i, 18.07.2000 [2].

7. *Puccinia universalis* Arthur.

Tarqalishi: *A. dracunculus* L. – SV: Samarqand tumani, Jomboy, 18.07.1956 [9].

Shuvoq o‘simliklarida keng tarqalgan *Puccinia absinthii* turining morfologik va kasallik belgilarining qisqacha tavsifi

***Puccinia absinthii* DC.** – xo‘jayin o‘simligi *Artemisia absinthium* L. O‘simlik barglarining har ikki tomonida, asosan, pastki qismida zamburug‘ spermogoniyalari joylashadi. Barglarning yuza qismida juda zich guruhlar hosil qilib yoki tarqalgan holatda bo‘lib, zamburug‘inchoq yoki yumaloq shaklda, rangi och jigarrang. Uredeniosporalari ellipssimon, sharsimon, ovalsimon, 24–35×22–29 mkm, qobig‘ining qalinligi 1,5–2 mkm, tikansimon, rangi sariq. Teliosporalar ellipssimon, zamburug‘inchoq, 38–56×18–30 mkm, pastki qismi biroz toraygan, yuqori qismi yumaloq, qobig‘ning rangi kashtan-qo‘ng‘ir tusda, uzunligi 85 mkm gacha [19] (1-rasm).



1-rasm. A) *P. absinthii* turi bilan zararlangan *A. absinthium* L. o‘simligi;
B) *A. absinthium* L. o‘simligining zararlangan bargi;
C) *P. absinthii* zamburug‘ining urediniosporalari;
D) *P. absinthii* zamburug‘ining teliyalari.

Xulosa

Olib borilgan tadqiqot ishlari davomida O‘zbekistonda *Puccinia* zamburug‘larining 7 ta turi *Artemisia* turkum o‘simliklarining 15 ta turida uchrashi aniqlandi. Mikologik tadqiqotlarimiz natijasiga ko‘ra, Namangan, Jizzax va Samarqand viloyatlarida tarqalgan *Artemisia* o‘simliklarida *Puccinia* turkumining eng ko‘p – 5 ta, Toshkent viloyatida – 2 ta va eng kam Farg‘ona, Buxoro, Sirdaryo viloyatlarida 1 tadan turi uchrashi aniqlandi. Tadqiqotlarimiz davomida *Puccinia* turlari bilan zararlangan o‘simliklarning necha marotaba aniqlanganligi adabiyotlar tahlili natijasida o‘rganilganida, eng ko‘p Toshkent, Samarqand, Namangan, Jizzax viloyatlarida kuzatilgan bo‘lsa, aksincha, Farg‘ona, Buxoro, Surxondaryo va Sirdaryo viloyatlarida kam aniqlanganligi kuzatildi. Olgan ma’lumotlarimizga ko‘ra, *P. absinhii* turi keng tarqalgani va Toshkent, Samarqand, Namangan, Jizzax, Farg‘ona, Buxoro, Surxondaryo, Sirdaryo viloyatlarida uchrashi aniqlandi. *P. universalis* turi faqat Samarqand viloyatida, *P. chrysanthemi* turi esa faqat Jizzax viloyatida uchrashi kuzatildi. *A. dracunculus* o‘simligi *Puccinia* turining eng ko‘p – 4 ta turi bilan zararlanishi, *P. absinthii* turi *Artemisia* turkumining eng ko‘p – 11 ta turini zararlashi tadqiqotlar natijasida aniqlandi. Shuningdek, Toshkent viloyatida *A. absinthium* L. o‘simligida ilk bor *P. absinthii* turi uchrashi kuzatildi. Yuqoridagi ma’lumotlar shuvoq turkumining dorivorlik xususiyatlarini O‘zbekiston sharoitida o‘rganish va uning parazitlariga qarshi choralar dasturini ishlab chiqish zaruratini ko‘rsatadi.

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PUCCINIA SPECIES OF MEDICINAL WORMWOOD (*ARTEMISIA* L) PLANTS IN UZBEKISTAN

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Key words: *Asteraceae*, *Pucciniaceae*, distribution, host plants, taxonomic analysis.

Mycological expeditions were conducted in places where wormwood is spread in the north-eastern regions of Uzbekistan. In the collection of plants infected with rust fungi found in the genus Artemisia, the methods of sampling and monitoring were used.

As a result of studying the scientific literature, taxonomic analysis of samples collected during our field research and morphological re-examination of samples of Puccinia species stored in the Tashkent Mycological Herbarium (TASM), 7 Puccinia (P. Absinthii, P. artemisiicola, P. chrysanthemi, P. cinae, P. conferta, P. dracunculina and P. Universalis) species were found to taste. When analyzing the distribution of Puccinia species in plants, P. absinthii (42.3 %) was the most common type, followed by P. chrysanthemi (15.5 %), P. cinae and P. conferta (11 .5 %) fungi were observed to be species such as P. universalis (3.8 %), P. artemisiicola and P. dracunculina (7.7 %) to a lesser extent.

In the course of scientific work, for the first time, the distribution of Puccinia species distributed in medicinal wormwood plants in the regions of Uzbekistan was analyzed. According to this, in the Artemisia plants distributed in the regions of Uzbekistan, the most species of the Puccinia family are found in Namangan, Jizzakh and Samarkand regions (5), Tashkent region (2) and the least in Fergana, Bukhara, Surkhandarya and Syrdarya. (1) species were found in the regions. Also, when the prevalence of Puccinia fungi of wormwood plants spread in Uzbekistan was studied, Jizzakh region had the highest number (11 times), followed by Namangan (10 times), Samarkand (8 times), and Tashkent (7 times). it was found that regions such as times) On the contrary, it was observed that Fergana (4 times), Bukhara (2 times), Syrdarya and Surkhandarya (once each) regions were the least recorded. It was observed that the distribution of Puccinia species spread on Artemisia plants at the regional scale is the highest in Jizzakh, 25% in Namangan, 18% in Samarkand, and 16% in Tashkent. It was observed that the indicators are 9% in Fergana and 5% in Bukhara. In particular, it was observed that the lowest meeting rate is 2% in Sirdarya and Surkhandarya. According to our research, A. dracunculus species with 4 Puccinia species, A. absinthium and A. tenuisecta species (3 each), A. diffusa, A. persica, and A. vulgaris species (2 each) and A. annua , A. eriocarpa, A. ferganensis, A. leucodes, A. juncea, A. turanica, A. serotina, and A. tournefortiana species (only one each) were observed to be infected by Puccinia species.

In the course of mycological observations, it was observed that Puccinia absinthii was found in all representatives of the wormwood family, and that it was frequently found in almost all regions and caused a lot of damage to wormwood. P. absinthii was found for the first time in A. absinthium plant in Tashkent region.

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