ENDOFIT MIKROORGANIZMLARNI O`SIMLIKLARDAN AJRATIB OLISH, STRELIZATSIYA USULLARI VA ULARNI TAHLILI

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Annotatsiya: U*shbu maqolada endofit achitqilar tavsifi, xususiyatlari, ajratib olish usullari va metodlari haqida. Bilamizki, dunyo miqyosida o`simliklardagi endofit mikroorganizmlar keng ko`lamda o`rganilib borilmoqda. Jumladan, endofit zamburug`lar, bakteriyalar shular qatorida. Ko`rishimiz mumkinki, endofit achitqilar ular orasida end kam o`rganilgani hisoblanadi. Shu sababdan ham biz endofit achitqilar xususida ilmiy ish boshladik va bunda dastlab jahonda qay darajada o`rganilgani diqqatimizni tortdi. Bunda endofit achitqilarni ajratib olish, ularni morfologik, fiziologik identifikatsiyalash, ikkilamchi metabolitlarini tahlil qilib, farmasivtik ahamiyatga ega bo`lgan jihatlarini sanoatga tadbiq qilishni oldimizga vazifa qilib olganmiz.*

Abstract: *This article is about endophytic yeast description, properties, isolation methods and methods. We know that endophytic microorganisms in plants are widely studied worldwide. In particular, endophytic fungi and bacteria are among them. We can see that endophytic yeasts are the least studied among them. For this reason, we started scientific work on endophytic yeasts, and at first we were drawn to the extent to which they were studied in the world. We have set ourselves the task of isolating endophytic yeasts, their morphological and physiological identification, analyzing their secondary metabolites, and applying their pharmaceutical aspects to industry.*

Kalit so`zlar: *endofit achitqilar, identifikatsiyalash, ajratib olish, Citrus reticulata cv. Blanco,*

KIRISH:

Endofit mikroorganizmlar bugungi kunda dunyo bo`ylab keng miqyosda o`rganilmoqda va bu haqida olimlar ko`plab ma`lumotlar to`plashgan. Endofit mikroorganizmlarning o`simliklarning o`sishi, rivojlanishidagi roli va xususiyatlari muhim amaliy ahamiyatga ega. Jumladan, endofit mikroorganizmlar birinchi marta nemis botaniki Jon Link tomonidan 1809-yilda tavsiflangan. Dastlab o`simliklardagi roli noma`lum bo`lsa-da, keyinchalik

fransuz olimi Bicham “mikroorganizm” deb atashni taklif etdi va nihoyat 1887-yilda Viktor Galipp o`simlik to`qimalarida uchraydigan bakteriyalarni topdi [2]. Endofit mikroorganizmlar boshqa biologik tushunchalar singari vaqt o`tishi bilan o`z tasdiqini topishida ko`plab ilmiy tadqiqotlarga asoslangan. “Endofit” atamasi “endo” ichkarida va “fiton” o`simlik degan ma`nolarni anglatadi [4]. “Endofit” atamasi dastlab 1866-yilda Genrix Anton De Bari tomonidan qo`llanilgan bo`lib, unda endofitlar o`simlik to`qimalarida yashovchi har qanday mikroorganizm ya`ni zamburug`lar, baktariyalar sifatida ta`riflangan. 1986-yilda Kerroll endofitik organizmlarni o`simlik to`qimalarida yashovchi va turli infeksiyalarga sabab bo`luvchi zamburug`lar deb ta`riflagan. 1991-yilda Petrini endofitlarga o`simlik to`qimalarida yashashi mumkin bo`lgan barcha mikroorganizmlar zamburug`lar, bakteriyalar, aktinomitsetlar va mikoplazmalar deb ta`riflagan [3] Bundan tashqari ularni o`simlikning barglarida, novdalarida, poyalarida o`z hayot sikliga ega bo`lgan, xo`jayin o`simlikka ziyon yetkazmaydigan har qanday mikroorganizmlar deb ta`riflagan va endofitlarning o`simlik bilan simpiotik munosabatlarini ko`rsatib o`tgan. Ba`zida endofitlar o`simlikka ziyon yetkazadigan zaif patogenlar ham bo`lishi mumkinligi haqida aytib o`tgan. Biroq ko`pchilik endofitlarning patogen emasligi o`z tasqig`ini topgan [1]. Endofitik mikroorganizmlar o'simliklarning yashirin yo'ldoshlari bo'lib, o'simlik ichida o'zaro manfaatli hayot kechiradi. Ushbu endofitlar quruqlikdagi o'simliklar bilan bog'langan va rivojlangan deb taxmin qilingan bo'lsa-da, endofitlar o'tgan asrda tan olingan. Endofitlarning foydali ta'siri yangi dorivor ahamiyatga ega bo'lgan birikmalarni olish imkoniyati, shuningdek, ularning hosildorlikni oshirishdagi roli bilan ahamiyat kasb etmoqda, chunki ular turli xil birikmalar hosil qiladi va patogen va patogen bo'lmagan boshqa mikroorganizmlar bilan o'zaro ta'sir qiladi. Molekulyar biologiyaning zamonaviy vositalari va usullarining rivojlanishi bilan ushbu mikroorganizmlarning to'g'ri identifikatsiyasini aniqlash va mezbon va boshqa mikroorganizmlar bilan o'zaro ta'sirini bilish mumkin bo'ldi []

Endofitlar biologiyasi va biotexnologiyasi zamonaviy biologiyadagi so'nggi tadqiqotlarda dolzarb mavzuga aylandi, ammo endofitlar va endofitizmning tabiati haqida to'liq tushuncha hamon to`la shakllanmagan. Biroq, endofitik arxeyalar, viruslar, viroidlar va daraxtlardagi protozoalarni, shuningdek endofungal bakteriyalar, mikoviruslar va bakteriofaglar kabi endofitik mikroorganizmlarning mumkin bo'lgan endosimbiontlarini o'rganish uchun qo'shimcha tadqiqotlar talab etiladi. Ushbu jamoalar o'rtasidagi mikrob-mikrob o'zaro ta'sirini va mezbon o'simlik mikroblarining o'zaro ta'sirini va ularning o'simlik salomatligi uchun ta`sirlarini tushunish evolyutsiya va amaliy fanlarda

katta ahamiyatga ega bo'lishi mumkin. Bundan tashqari, ushbu endofitik va endofungal jamoalar tomonidan ishlab chiqarilgan bioaktiv kimyoviy moddalar sohasini yanada tavsiflash uchun tizimli yondashuvlar zarur [5].

Endofit mikrorganizmlarning biotexnologiyasida ularning aniq belgilab olingan bir qancha xususiyatlarini sanab o`tish mumkin. 1. Endofitlardan bio o`g`it sifatida foydalanish istiqbollari 2.Endofitlardan fermantlarni ishlab chiqarish, ularni tozalash va ularni qo`llash [6]. 3. Endofitlardan ikkilamchi metabolitlarni ajratish va qo`llash 4.Endofitlar vositasida yangi biopreparatlar yaratish va ularning farmasivtik dasturlarda qo`llanishida endofitlarning biotexnologik potensiali. 5.Endofitlarning biodegradatsiya, metallarni olish, bioakkumulyatsiyadagi potensiali 6.Nanobiopreparatlar, nenopestitsidlar, nano`g`itlar kabi turli xususiyatlarga ega nanomateriallar ishlab chiqarishda endofit mikroorganizmlarning qo`llanilish ko`lami 7.Endofitlarning genetik materiali, ularning funksional genomikasi va uning qo`llanilishi. Ushbu yuqoridagilar endofitlar biotexnologiyasidagi potensialini belgilovchi asosiy vositalardan bo`lib hisoblanadi.

Insonning turli yuqumli kasalliklarini keltirib chiqaradigan mikroorganizmlarning antibiotiklarga chidamliligining tez o'sib borishi samarali mikroblarga qarshi birikmalarning yangi tabiiy manbalarini izlashni talab qiladi. Tatariston Respublikasida o‘sadigan o‘n ikkita dorivor o‘simliklardan endofitik aktinobakteriyalarni ajratib olish va ularning nafas yo‘llari infektsiyalari bilan bog‘liq bo‘lgan besh turdagi gramm-musbat bakteriyalarga qarshi faolligini baholash natijalari olingan bo`lib bu ham uning biotexnologiyada ahamiyatini ko`rsatadi. Aktinobakteriyalarning 68 ta izolyatlari o‘simliklarning ildizi, poyasi va barglaridan ajratib olingan bo‘lib, endofitlarning asosiy soni o‘rganilayotgan o‘simliklarning ildizlarida (38,24%), eng kami esa barglarida (29,41%) bo‘lgan. 14 ta izolyag bemorlarning nafas olish yo'llaridan ajratilgan *Staphylococcus aureus, Staphylococcus epidermidis, Enterococcus faecalis, Corynebacterium striatum, Bacillus subtilis*ga qarshi antimikrobial ta'sir ko'rsatishi aniqlangan [7]. Endofitlarning farmasivtik potensiali insonning turli kasalliklariga davo bo`lishi mumkin bo`lgan moddalarni endofitlar tomonidan sintez qilinishidadur. Bunda ularning antimikrob qobiliyati eng asosiy biotexnologik salohiyatini ochib beruvchi omil sifatida ko`zga tashlanadi. Endofitlar biologiyasi va biotexnologiyasi bugungi kunda dunyo olimlari tomonidan keng ko`lamda o`ranilmoqda va bu ularning tadqiqotlari asosida sanoatlashgan “endofitlar biotexnologiyasi” tarmog`i uchun asosiy zamin yaratib bormoqda.

MATERIAL VA METODLAR:

Bugungi kunda endofit mikroorganizmlar qatorida endofit achitqilar ham o`rganilmoqda, ammo nisbatan kam o`rganilganini aytib o`tish kerak. Bunda endofit achitqilarni ajratib olishdagi bir qancha murakkabliklarni hisobga olish kerak. Endofit achitqilar o`simliklarning uglevodga boy bo`lgan qismlarida ko`p miqdorda uchraydi va shu sababdan ham ularni o`simlikning saqlash qismlarida(ildizmevalar, tugunaklar), o`simliklarning generativ qismlari, ildizlarida uchrash ehtimoli yuqori. Endofit achitqilarni ajratib olishda mandarin(*Citrus reticulata*), kivi (*Actinidia deliciosa*), olma(*Malus domestica*), lavlagi (*Beta vulgaris*) kabi o`simliklarning mevalaridan olish uchun bir nechta ozuqa muhitlaridan foydalanildi. Dastlab, o`simlik qismlari strelizatsiya qilindi, yaxshilab yuvildi. Ular 5 mm atrofida strell skalpel bilan maydalandi, petri idishlariga joylandi. Bunda jami 18 ta petriga 9 ta antibiotokli, 9 ta antibiotoksiz, har bir mevaning bittasi oddiy strell, ikkinchisi spirt bilan 2-3 minutda, uchinchisi NaOCl 3foizlida 3-4 minut qoldirildi, petri chashkasiga olinib, harorati 30 gradusda 3 kun qoldirildi va keyin natijalarni tahlil qildik.

Natija va Muhokamalar: O`simlik qismlari agarli suslaga ekildi va buni quyidagi jadvalda shunday ifodalash mumkin:

1-jadval.

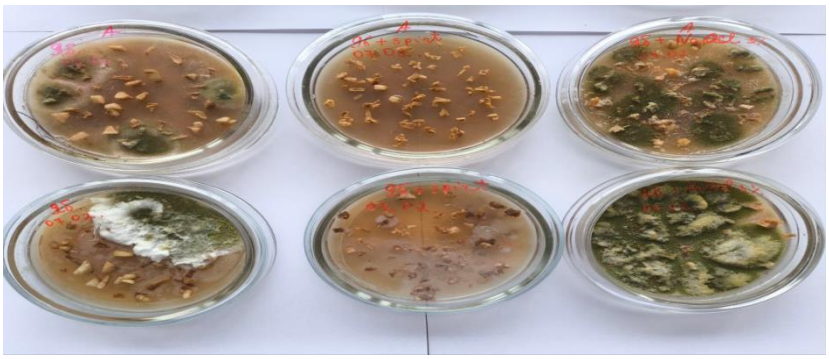
			Olma	Kivi	Mandarin
Antibiotokli	Oddiy	Meva q.s	45	26	21
		Kolonlar iya s	spl	0	33 % spl
	Spirt	Meva q.s	50	25	17
		Kolonlar iya s	0	Spl	33 % spl
	NaOCl 3%	Meva q.s	41	40	27
		Kolonlar iya s	13	Spl	1
Antibiotoksiz	Oddiy	Meva q.s	40	27	29
		Kolonlar iya s	9/ 40 % spl	2	1
	Spirt	Meva q.s	49	27	16

		Kolonia s	2 / 75 % spl	Spl	7
	NaOCl 3%	Meva q.s	47	29	21
		Kolonia s	spl	spl	0

1-jadval. Olma(*Malus domestica*), kivi (*Actinidia deliciosa*), mandarin(*Citrus reticulata*)larning antibiotokli va antibiotoksiz ozuqa muhitda oddiy, spirtda, NaOCl 3% lar orqali strillangan holatda jami qo`yilgan meva qismlari soni (meva q.s.) va hosil bo`lgan koloniyalar soni(Koloniya s), spl(ozuqa muhitni butunlay qoplab olgan koloniyalarni bildiradi).

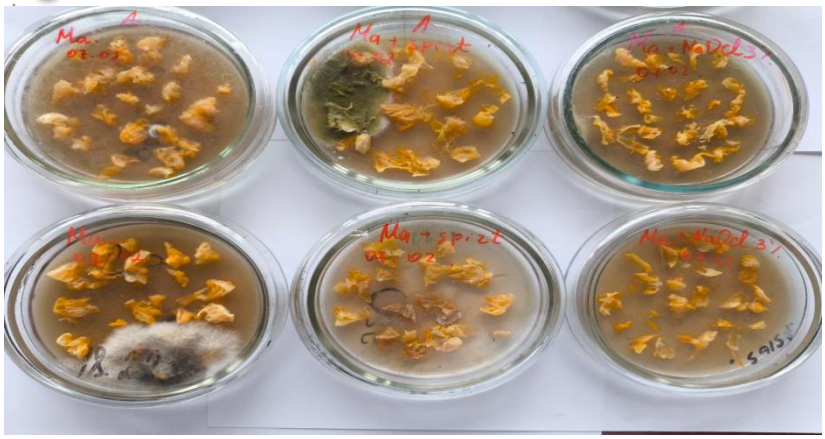
Bunda ko`rinib turibdiki, kivida antibiotokli oddiy strell holatda, olmada antibiotokli oddiy strell holatda, mandarinda antibiotoksiz NaOCl 3% da strell holatda koloniyalar hosil bo`lmagan. Uchala mevadaan mandarinda nisbatan kamroq koloniyalar hosil bo`lib, kivida oddiy strellga qaraganda, spirt va NaOCl 3% da ko`proq koloniyalar paydo bo`lganligi kuzatildi. Olmada mandarin va kiviga nisbatan o`rta miqdorda koloniyalar paydo bo`lgan, ammo nisbatan alohida alohida koloniyalar bo`lib, buni olmada strellik yaxshi ekanligi bilan ham ifodalash munkum, ammo bu taxmin qay darajada ishonchli yana o`rganishni talab qiladi.

N.1



N.2

N.3



1-rasm. Olma(*Malus domestica*)(N.1), kivi (*Actinidia deliciosa*)(N.2), mandarin(*Citrus reticulata*)(N.3) lar koloniyalarining morfologik ko`rinishi.

XULOSA:

Xulosa qilib aytish mumkinki, endofit achitqilar bugungi kunda o`rganilish jarayonida ko`plab qiyinchilikka duch kelinsa ham, uning biotexnologik potensiali bizni endofit achitqilarni o`rganishga rag`batlantiradi. Bizda olma, kivi, mandarin kabi mevalar endofit achitqilarning uchrash ehtimoli yuqori degan ehtimol bilan tanlab olindi. O`zbekiston hududidagi mevalarda uglevodlar miqdori yuqori ekanligi, iqlim sharoitlarini va mevalarning, uglevodga boy o`simliklarning ko`pligini hisobga olib endofit achitqilarni ajratib olish vas shu kabi endofit achitqilarni o`rganishga kirishdik. Bizda olingan izolyatlar qayta ekish qilib toza kulturalarga olindi va shtammlar saqlab qo`yildi. Ularning ikkilamchi metabolitlari tahlil qilinib, sanoatning farmasivtika sohasida immunomodulyator, infeksiyaga qarshi vosita sifatida foydalanish istiqbollari keyingi ishlarimizning maqsadi hisoblanadi. Bunda endofit achitqilarni ajratib olish usullarini yanada osonlashtirish ustuda ishlashni ham keying tadqiqotlarda vazifa sifatida ko`rishimiz mumkin.

ADABIYOTLAR RO`YXATI:

1. Xuan Peng, Ya Wang, Li Juan Tang, Xi Xi Li, Yi Wen Xiao, Zhi Bin Zhang, Ri Ming Yan, Hui Lin Yang, Jun Chang, Bo Zhu & Du Zhu (2018) Yeasts from Nanfeng mandarin plants: occurrence, diversity and capability to produce indole-3-acetic acid, Biotechnology & Biotechnological Equipment, 32:6, 1496-1506, DOI: 10.1080/13102818.2018.1487337 https://doi.org/10.1080/13102818.2018.1487337

2. Bhuyan B. et al. Isolation of yeast endophytes from healthy seeds of Capsicum annuum L. and assessment of their antimicrobial activity //Journal of Applied Biology and Biotechnology. – 2023. – T. 11. – №. Issue. – C. 111-116.

3. Sepúlveda, Ximena, Diego Silva, Ricardo Ceballos, Silvana Vero, María Dolores López, and Marisol Vargas. 2022. "Endophytic Yeasts for the Biocontrol of *Phlyctema vagabunda* in Apples" *Horticulturae* 8, no. 6: 535. https://doi.org/10.3390/horticulturae8060535

4. Tian S. et al. Biocontrol efficacy of antagonist yeasts to gray mold and blue mold on apples and pears in controlled atmospheres //Plant Disease. – 2002. – Т. 86. – №. 8. – С. 848-853.

5. Farahani L. et al. Effect of two strains of antagonistic yeasts in combination with silicon against two isolates of Penicillium expansum on apple fruit //Int Res J Appl Basic Sci. – 2012. – Т. 3. – С. 18-23.

6. Kachalkin A., Glushakova A., Streletskii R. Diversity of endophytic yeasts from agricultural fruits positive for phytohormone IAA production //BioTech. – 2022. – Т. 11. – №. 3. – С. 38.

7. Liu J. et al. Utilization of antagonistic yeasts to manage postharvest fungal diseases of fruit //International journal of food microbiology. – 2013. – Т. 167. – №. 2. – С. 153-160.

8. Kachalkin A., Glushakova A., Streletskii R. Diversity of endophytic yeasts from agricultural fruits positive for phytohormone IAA production //BioTech. – 2022. – Т. 11. – №. 3. – С. 38.

9. Sepúlveda, Ximena, Diego Silva, Ricardo Ceballos, Silvana Vero, María Dolores López, and Marisol Vargas. 2022. "Endophytic Yeasts for the Biocontrol of *Phlyctema vagabunda* in Apples" *Horticulturae* 8, no. 6: 535. https://doi.org/10.3390/horticulturae8060535

10. Kachalkin A., Glushakova A., Streletskii R. Diversity of endophytic yeasts from agricultural fruits positive for phytohormone IAA production //BioTech. – 2022. – Т. 11. – №. 3. – С. 38.

11. Isaeva O. V. et al. Endophytic yeast fungi in plant storage tissues //Biology bulletin. – 2010. – Т. 37. –С.26-34. https://scholar.google.com/scholar?hl=ru&as_sdt=0%2C5&q=Endophytic+yeast+fungi+in+plant+storage+tissues&btnG=

12. Annayev , M., Shodiyeva , D., & Annayev , M. (2023). BACILLUS SAFENSIS BAKTERIYA SHTAMLARINING BIOTEXNOLOGIK POTENSIALINI BAHOLASH. *GOLDEN BRAIN*, *1*(7), 25–30. Retrieved from https://researchedu.org/index.php/goldenbrain/article/view/2220

13. Olimjonova , S. G. qizi, & Shodiyeva , D. G. (2023). BAKTERIYALARNI SUYUQ VA QATTIQ OZUQA MUHITLARIDA O‘STIRISH SHAROITLARI. *GOLDEN BRAIN*, *1*(3), 182–188. Retrieved from https://researchedu.org/index.php/goldenbrain/article/view/1496

14. Vahobovna , M. Z. ., G'ulomjon qizi, O. S. ., & G`iyosovna , S. D. . (2023). CICHORIUM INTYBUSNI AN`ANAVIY TIBBIYOTDA QO`LLANILISHI, FITOKIMYOVIY TARKIBI VA FARMAKOLOGIYADAGI AHAMIYATI. *Scientific Impulse*, *1*(6), 1386–1392. Retrieved from http://nauchniyimpuls.ru/index.php/ni/article/view/4776

15. D. Shodiyeva, M. Bobakandova, M. Annaev, & J. Tokhirova (2023). IDENTIFICATION AND ISOLATION OF ENDOPHYTIC FUNGI PRODUCING L-ASPARAGINASE IN REPRESENTATIVES OF THE ASTERATCEA FAMILY. Science and innovation, 2 (D2), 107-112. doi: 10.5281/zenodo.7643932

16. Shodiyeva, D., Jamalova, F., Annayev , M., & Tohirova, J. (2023). HISTORY OF STUDY OF ENDOPHYTIC MICROORGANISMS. *GOLDEN BRAIN*, *1*(14), 20–29. Retrieved from https://researchedu.org/index.php/goldenbrain/article/view/3598

17. Shodiyeva Dildora, & Annayev Muxriddin. (2023). Berberis integerrimaning umumiy tasnifi, tarqalishi va tibbiyotda qo`llanilishi. *INTERNATIONAL JOURNAL OF RECENTLY SCIENTIFIC RESEARCHER'S THEORY*, *1*(1), 7–12. Retrieved from https://uzresearchers.com/index.php/ijrs/article/view/24

18. Худжанова, М. А., Шодиева, Д. Г., & Холжигитов, Х. Т. (2023). СОСТОЯНИЕ МИКРОЭЛЕМЕНТНОГО СТАТУСА У ДЕТЕЙ БОЛЬНЫХ ОСТРОЙ РЕСПИРАТОРНО-ВИРУСНОЙ ИНФЕКЦИЕЙ. *GOLDEN BRAIN*, *1*(6), 15-19.

19. Azzamov Ulug'Bek Azimovich, Shodiyeva Dildora G'Iyosovna, & Maxmudov Aziz Akmalovich (2023). ANTIBIOTIKLAR TA'SIR DOIRASIGA KO'RA KLASSIFIKATSIYASI. Talqin va tadqiqotlar ilmiy-uslubiy jurnali, 1 (17), 245-251.

20. Jamalova, F. A., & Boltayev, K. S. (2023). BACILLUS THURINGIENSIS BAKTERIYALAR ASOSIDA YARATILGAN BIOPREPARATLAR. GOLDEN BRAIN, 1 (3), 23-27. *2023*.

21. Dildora, S., Fazliddinovna, M., Gulnoza, O., & Shohzod, S. (2023). BACILLUS PUMILIS BAKTERIYALARI MIKROBIOLOGIK TAHLILI VA BIOTEXNOLOGIYADAGI AHAMIYATI. *ОБРАЗОВАНИЕ НАУКА И ИННОВАЦИОННЫЕ ИДЕИ В МИРЕ*, *22*(2), 154-161.

22. Boboqandova, M., & Shodiyeva, D. (2023). ENDOFIT BAKTERIYALARNING BIOLOGIK FAOL METABOLITLAR SINTEZ QILISH XUSUSIYATLARI VA ULARNING QO`LLANILISH SOHALARI. *Interpretation and Researches*, *1*(3). извлечено от https://interpretationandresearches.uz/index.php/iar/article/view/42

23. Hamza, S. S., & Giyosovna, S. D. (2023). Development of Optimization Models of Logistics Processes in Large Cities. *Web of Synergy: International Interdisciplinary Research Journal*, *2*(6), 246-253.

24. Shodiyeva , D. G., Annayev , M. G. o‘g‘li, Mamarasulova , N. I., & Odilova , G. M. (2023). BERBERIS INTEGERRIMA BUNGENING IKKILAMCHI METABOLITLARINING DORIVORLIK XUSUSIYATLARI VA BIOTEXNOLOGIK AHAMIYATI. *GOLDEN BRAIN*, *1*(10), 33–43. Retrieved from https://researchedu.org/index.php/goldenbrain/article/view/2998

25. Giyosovna, S. D., Maqsudovna, O. G., Isrofilovna, M. N., & Shodiyevich, S. H. (2023). BACILLUS AVLODIGA MANSUB BAKTERIYALARNING BIOTEXNOLOGIK POTENSIALI. *Innovations in Technology and Science Education*, *2*(7), 1154-1162.

26. Hamza ogli, S. S., & Giyosovna, S. D. (2023). JAMOAT TRANSPORTIDA YO ‘LOVCHILAR TASHISHNI TASHKIL ETISH IMKONIYATLARI VA UNDA TRANSPORT LOGISTIKASI O’RNI. *Ustozlar uchun*, *45*(5), 43-50.

27. Shodiyeva Dildora G'iyosovna, & Tohirova Jayrona Izzatullayevna. (2023). VAKSINA OLISH TEXNALOGIYASI VA UNING AHAMIYATI. GOLDEN BRAIN, 1(3), 256–260. https://doi.org/10.5281/zenodo.7605291

28. Bobakhandova , M. F., & Shodiyeva , D. G. (2023). USAGE OF CICHORIUM INTYBUS IN TRADITIONAL MEDICINE, PHYTOCHEMICAL COMPOSITION AND IMPORTANCE IN PHARMACOLOGY. *GOLDEN BRAIN*, *1*(5), 43–49. Retrieved from https://researchedu.org/index.php/goldenbrain/article/view/1688

29. Giyosovna, S. D. (2023). CICHORIUM INTYBUSDAN YANGI BIRIKMA OLISH VA ULARNING BIOLOGIK TASIRI. *O'ZBEKISTONDA FANLARARO INNOVATSIYALAR VA ILMIY TADQIQOTLAR JURNALI*, *2*(16), 156-164.

30. D. Shodiyeva, F. Ashirov, & A. Murodova (2023). EFFECT OF BACILLUS THURINGIENSIS BACTERIAL STRAINS ON PHASEOLUS VULGARIS PLANT BIOMETRIC INDICATORS AND DEVELOPMENT. Science and innovation, 2 (D2), 49-56. doi: 10.5281/zenodo.7632227

31. Shodiyeva , D. G. (2023). ODDIY SACHRATQI (CICHORIUM INTYBUS L) O‘SIMLIGIDAN ENDOFIT MIKROORGANIZMLAR AJRATISH VA ULARNING BIOTEXNOLOGIK POTENSIALINI BAHOLASH. *GOLDEN BRAIN*, *1*(3), 230–240. Retrieved from https://researchedu.org/index.php/goldenbrain/article/view/1506

32. Makhmudova Zakro Vahobovna, Shodiyeva Dildora, & Olimjonova Sadokat Gulomjon’s daughter. (2023). BIOLOGY AND BIOTECHNOLOGY OF

ENDOPHITE MICROORGANISMS. *World Bulletin of Public Health*, *18*, 115-117. Retrieved from https://scholarexpress.net/index.php/wbph/article/view/2074

33. Shodiyeva Dildora, & Bobakandova Mekhriniso. (2023). APPLICATION AREAS OF BIOLOGICALLY ACTIVE METABOLITES PRODUCED BY ENDOPHITE BACTERIA. *E Conference Zone*, 92–95. Retrieved from https://www.econferencezone.org/index.php/ecz/article/view/1941

34. Shodiyeva, D. (2023). BIO-MORPHOLOGICAL CHARACTERISTICS, GEOGRAPHICAL DISTRIBUTION AND USE IN TRADITIONAL MEDICINE OF CICHORIUM INTYBUS. GOLDEN BRAIN, 1 (2), 252-256. *2023*.

35. Shodiyeva , D. (2023). INDOLIL SIRKA KISLOTA MIQDORINI ANIQLASH. *GOLDEN BRAIN*, *1*(2), 321–324. Retrieved from https://researchedu.org/index.php/goldenbrain/article/view/1361

36. Shodiyeva Dildora G`iyosovna, Bobaqandova Mexriniso Fazliddinovna , Shayqulov Hamza Shodiyevich. (2023). FITOPATOGENLARGA QARSHI BAKTERIYALARDAN FOYDALANISH VA ULARNING SAMARADORLIGINI BAHOLASH. *IQRO* , *2*(1), 78–82. Retrieved from https://wordlyknowledge.uz/index.php/iqro/article/view/222

37. Annayeva, D. G. Y., Azzamov, U. B., & Annayev, M. O. S. (2022). O'SIMLIGIDAN ENDOFIT MIKROORGANIZMLAR AJRATIB OLISH.

38. Shodiyeva , D. (2023). SANOAT MIKROBIOLOGIYASINING BIOTEXNOLOGIYADAGI AHAMIYATI. *GOLDEN BRAIN*, *1*(2), 116–120. Retrieved from https://researchedu.org/index.php/goldenbrain/article/view/1310

39. G`iyosovna, S. D., & Abdusalomovna, J. F. (2023). BACILLUS AVLODIGA MANSUB BAKTERIYALARNING ANTIMIKROB VA ANTOGONISTIK XUSUSIYATLARI. *Scientific Impulse*, *1*(6), 1852–1858. Retrieved from http://nauchniyimpuls.ru/index.php/ni/article/view/4968