



QIZILMIYA GLYCYRRHIZA GLABRA LINN O'SIMLIGIDAN AJRATILGAN ENDOFIT BAKTERIYALARNING QIZILMIYA URUG 'LARI UNUVCHANLIGI VA UNISH QUVVATIGA TA'SIRI

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ABSTRACT

Qizilmiya o'simligi dorivor o'simliklardan biri bo'lib, antidiabet, antimikrob, virusga qarshi va boshqa bir qancha dorivor xususiyatga ega. Bundan tashqari, qizilmiya o'simligi yuqori sho'rlanishga, hamda qurg'oqchilikka chidamli. Hozirgi ekologik keskinlashuvda bu o'simlikdan va uning mikroalamidan foydalanish muhim. Shuning uchun bu dorivor o'simlikni endofitlari ajratilib, xususiyatlarini o'rganmoqdamiz. Qizilmiya o'simligini urug'laridan yetishtirishda muammolar ko'pligi sababli, ajratilgan endofit bakteriyalarning urug'larga ta'siri o'rganildi.

Kirish: Hozirgi vaqtda qizilmiya yetishtirib uning ildizini xorijga export qiladigan fermer xo'jaliklari ancha ko'paygan. Ayniqsa Qoraqalpog'iston qizilmiya o'stirib qayta ishlashda yetakchi hudud hisoblanadi. Shunday bo'lsada fermerlar qizilmiyani o'stirishda katta muammolarga duch kelishmoqda, jumladan qalamchadan o'stirish qiyinligi, o'simlik ildizi tez rivojlanmasligi va o'simlikning juda sekin o'sishi., Bizga ma'lum abiotik va biotik faktorlar o'simlik o'sishi va rivojlanishiga salbiy ta'sir ko'rsatadi. Bunday sharoitlarda o'simlikni o'sishini jadallashtiradigan, turli stress faktorlarga chidamliligini oshiradigan va turli kasalliklardan himoya qiladigan biologik texnologiyalar yaratish muhim ahamiyat kasb etadi.

Bizga ma'lumki, qizilmiya boshqa o'simliklar kabi mikroblar bilan assotsiatsiyada yashaydi. Xitoyda qizilmiya o'simligidan endofit zamburug'lar *Aspergillus* va *Chaetomium* turlari ajratib olingan[4]. Qizilmiya o'simligidan *Rhizobiaceae*, *Pseudomonas*, *Novosphingobium* va *Pantoea* turlari ham ajratib olingan[9]. Shimoliy-g'arbiy Xitoyning cho'l hududlarida o'sadigan yovvoyi qizilmiya o'simligidan *Acremonium nepalense*, *Acrocalymma vagum*, *Alternaria chatarum*, *Alternaria chlamydospora*, *Alternaria longissima*, *Darksidea alpha*, *Paraphoma chrysanthemicola* va *Preussia terricola* endofit bakteriyalari ajratib olingan hamda qurg'oqchilik stressi ostida o'simlikka ta'siri o'rganilgan[6]. *A. chlamydospora* va *P. terricola* o'simlikning umumiy biomassasini va ildiz biomassasini oshirgan. *Acrocalymma vagum* va *Paraboeremia putaminum* ta'siri o'rganilganda o'simlik biomassasiga, ildiz uzunligiga, umumiy ildiz uzunligiga, ildiz diametriga, glitsirrizik kislota va glitsirrizin tarkibiga sezilarli darajada ijobiy ta'sir ko'rsatgan[7]. *G.Glabra* o'simligidan ajratilgan



zamburug'larning antioksidantligi va antimikobakterialligi o'rganilgan[9]. *G.Glabradan* ajratilgan endofit zamburug'lar indol sirka kislotasini (IAA) ishlab chiqarishini kuzatgan[1]. *G.glabra* L. dan ajratilgan endofit zamburug' *Aspergillus eucalypticola* tomonidan glabridin olish o'rganilgan[2]. *G.glabradan* ajratilgan endofit *Bacillus atrophaeus*ni *Verticillium dahliae* ga qarshi antogonizmi o'rganilgan[8]. *Bacillus cereus* G2 endofiti sho'rlanish sharoitida qizilmiya o'simligidagi osmotik va oksidlovchi stressni yengillashtirishini aniqlagan[10]. Qizilmiya o'simligining o'sishini rag'batlantiruvchi bakteriya (PGPB) larni aniqlashgan[5].

Lekin qizilmiya o'simligi endofit mikroorganizmlari respublikamizda o'rganilmagan. Mintaqamizda qizilmiya bilan assotsiatsiyada yashovchi endofit bakteriyalarni molekular biologik metodlar bilan aniqlash, qolaversa o'simlik bilan birga assotsiatsiyada yashovchi mikroblarning biologik xususiyatlari va o'simlikning hayot jarayonlaridagi faoliyatini o'rganish katta ahamiyatga ega.

Material va metodlar

Qizilmiya o'simligi Xorazm viloyatidan olib kelindi, ildizlari ajratilib, mikrobiologik laboratoriyada (Milliy universiteti Biologiya fakulteti, mikrobiologiyasi laboratoriyasida) bajarildi. Ildizlar suvda yuvilgandan so'ng, ildizlar 96% etanolga, so'ngra 2,5% NaClO ga botirish orqali sterilizatsiya qilindi va steril distillangan suvda uch marta yuvildi[11]. Sterilizatsiya qilingan ildizlardan bir nechta bo'laklar aseptik tarzda kesilib, steril sho'r suvda gomogenlashtirildi. Shundan so'ng, gomogenat 10^{-6} gacha suyultirildi va va turli ozuqa muhitlarga (Eshbi, Chapek, pepton, YEM) ekildi. Ekilgan kulturalar 5 kundan keyin tekshirib tozalandi va molekulyar identifikatsiya qilinib, NCBI ma'lumotlar bazasiga joylashtirildi.

Ajratib olingan endofitlarni qizilmiya urug'lari unuvchanligi va unish quvvatiga ta'sirini o'rganish. Laboratoriya tadqiqotlarida qizilmiya urug'larining unish quvvati va unuvchanligiga endofitlarning ta'siri tadqiq qilindi. Endofit shtammlari NB muhitida 30°C da 100 ml li kolbalarda o'stirildi. 1 haftalik o'sishdan so'ng, o'simliklar urug'lari *P. polymyxa* ning 10 ml suyultirilgan ozuqada namlash orqali inokulyatsiyalandi. Urug'larning unish quvvati va unuvchanligini tadqiq qilishda urug'lar bakteriya suyuq kulturalari bilan inokulyatsiyalanib Petri kosachalariga namlangan filtr qog'ozi ustiga joylashtirildi va maxsus termostatda 25°C bo'lgan haroratda saqlandi. Qizilmiya urug'lari kuchsiz urug'lar guruhiga kiradi, shuning uchun endofit bakteriyalar bilan inokulyatsiyalanib unish quvvati, unuvchanligi aniqlandi.

Natijalar va muhokama.

Endofit bakteriyalarning urug'lar unish quvvatiga ta'siri.

Ajratib olingan bakteriyalarni urug'larga ta'sir ettirganimizda ya'ni inokulyat qilganimizda unish quvvati va unuvchanlik sezilarli darajada oshdi, ayniqsa *Paenibacillus polymyxa*, *Pantoea agglomerans* va *Pseudomonas azotoformans* shtammlarida yaxshi natija ko'rsatdi. Qizilmiya urug'lari juda kuchsiz unuvchanlik va unish quvvatiga ega. *Paenibacillus polymyxa* bilan emlangan qizilmiya urug'larida unish quvvati 35 % ga, unuvchanlik 25 % foizga oshganini ko'rdik.

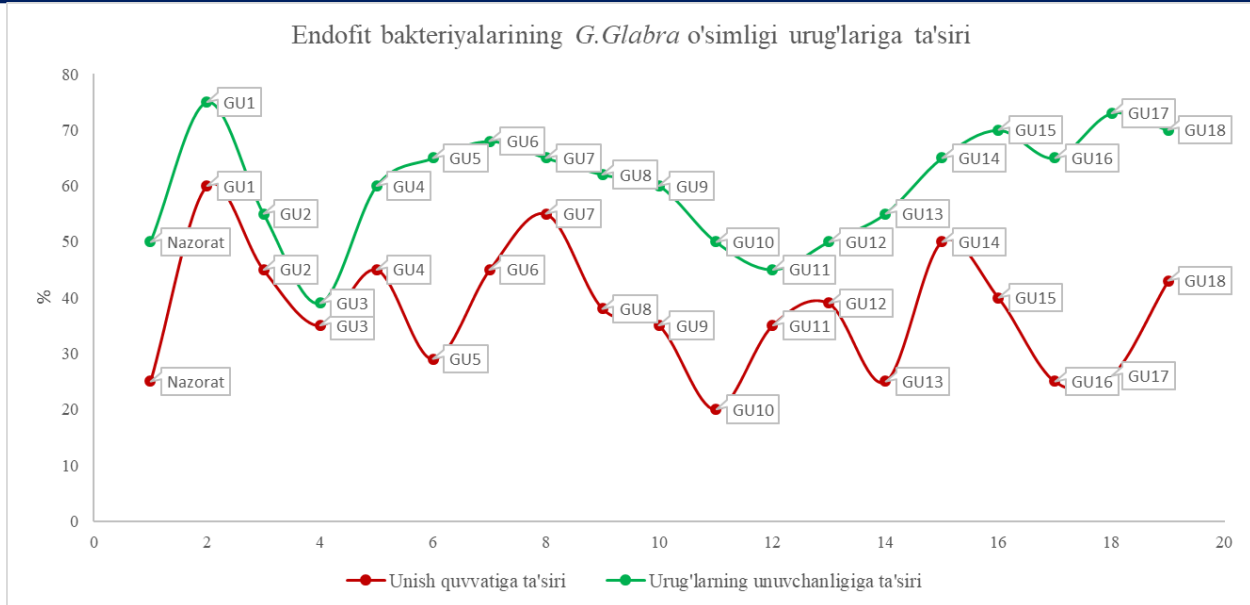
1-jadval

Shtamm belgisi	Nomi	Unish quvvatiga ta'siri(%)	Urug'larni unuvchanligi ga ta'siri(%)	Nishlarning uzunligi (sm)
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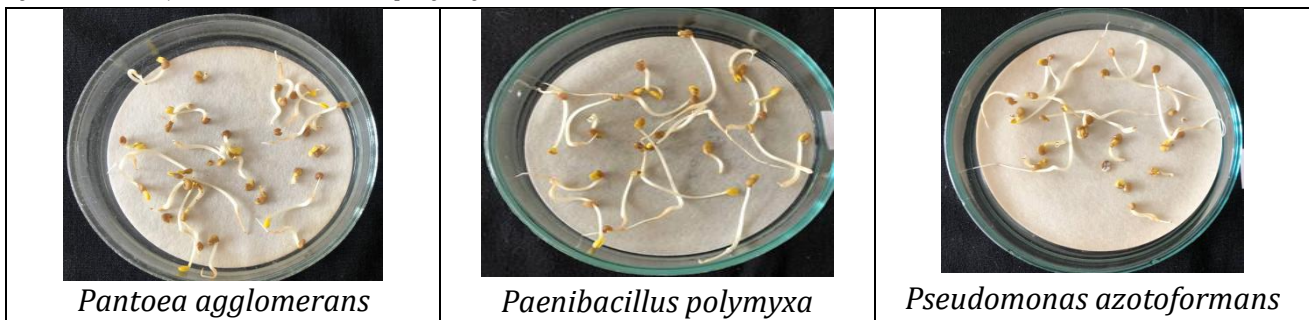
	<i>Nazorat</i>	25	50	2,54
GU1	<i>Paenibacillus polymyxa</i>	60	75	4,75
GU2	<i>Achromobacter piechaudii</i>	45	55	3,2
GU3	<i>Enterobacter hormaechei</i>	35	39	2,62
GU4	<i>Pantoea ananatis</i>	45	60	3,3
GU5	<i>Paenibacillus amylolyticus</i>	29	65	2,6
GU6	<i>Achromobacter xylosoxidans</i>	45	68	4,25
GU7	<i>Pseudomonas azotoformans</i>	55	65	4,75
GU8	<i>Enterobacter ludwigii</i>	38	62	3,9
GU9	<i>Bacillus velezensis</i>	35	60	3,15
GU10	<i>Escherichia coli</i>	20	50	2,5
GU11	<i>Enterobacter cloacae</i>	35	45	4,28
GU12	<i>Kosakonia cowanii</i>	39	50	3,45
GU13	<i>Citrobacter freundii</i>	25	55	2,25
GU14	<i>Bacillus cereus</i>	50	65	3,65
GU15	<i>Enterobacter hormaechei</i>	40	70	2,95
GU16	<i>Pantoea gaviniae</i>	25	65	1,95
GU17	<i>Klebsiella pneumonia</i>	26	73	2,1
GU18	<i>Pantoea agglomerans</i>	43	70	3,35

Paenibacillus polymyxa, *Pantoea agglomerans* va *Pseudomonas azotoformans* shtammlarida yaxshi natija ko'rsatdi.



1-rasm. Endofit bakteriyalarni qizilmiya urug'larining unish quvvati va unuvchanligiga ta'siri

Shuningdek, nish uzunligi *Paenibactillus polymyxa*da 4.75, *Pseudomonas azotformans*da 4.7, *Bacillus cerius*da 3.65 hamda *Pantoea agglomerans*da 3.35 sm ekanligi aniqlandi. Eng yaxshi natija *Paenibactillus polymyxa*da kuzatildi.



2-rasm. Endofit bakteriyalarning qizilmiya urug'leri unuvchanligiga ta'siri

Xulosa qilib aytamizki, endofit bakteriyalar o'simlik urug'lariga ijobiy ta'sir etdi, ayniqsa, *Paenibacillus polymyxa*, *Pantoea agglomerans* va *Pseudomonas azotoformans* shtammlarida yaxshi natija ko'rsatdi. Biz bu bakteriyalardan urug'larga inokulyant sifatida qizilmiya hosildorligini oshirishda, ya'ni ildizlar o'lchamini orttirishda qo'llashimiz mumkin.

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