

BACILLUS SAFENSIS BAKTERIYA SHTAMLARINING BIOTEXNOLOGIK POTENSIALINI BAHOLASH

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ANNOTATSIYA

Bacillus safinsis o'zining probiotik xususiyatga ega ekanligi bilan ham biotexnologik ahamiyat kasb etadi. *Bacillus safinsis* oziq-ovqat sanoatida ajralmas qism sifatida ishlatilib kelinadi. Misol uchun, Afrikada yetishtiriladigan, loviya moyida *Bacillus safensis* borligi aniqlangan bo'lib, ushbu mahsulot oziq-ovqat sanoatida xo'shbo'ylashtiruvchi sifatida ishlatiladi. *Bacillus safensis* ning ajratadigan ikkilamchi metabolitlari inson uchun bo'lgan moddalar ekanligi aniqlandi va ular yurak kasalliklarida, yo'g'on ichak saratonida, ko'krak saratonida qo'llanilgan.

Kalit so'zlar: *Bacillus safinsis*, *Bacillus altitudinis*, *Bacillus invictae*, *Bacillus pumilus*, indol-3-sirka kislota, *Bacillus tequilensis*.

Abstract: As an endophytic microorganism, *Bacillus safensis* has been found to produce growth substances, ensure phosphate solubility, produce indole-3-acetic acid and 1-aminocyclopropane-1-carboxylate deaminase.

Kirish *Bacillus safensis* yashash uchun kurashda ko'plab qiyinchiliklarga bardosh bera oladi va moslashuvchanligi yuqari darajada rivojlangan. Bu yashovchanligi uning bir qancha fiziologik va genetik xususiyatlari bilan bog'liq. Bu bakteriya *Bacillus pumilus* guruhiga kiradi va u *Bacillus pumilus*, *Bacillus altitudinis*, *Bacillus invictae* bilan o'xshash xususiyatlarga ega. *Bacillus safensis* hududlarda uchraydi va odatda boshqa bakteriyalar bilan hamkorlikda o'sish xususiyatiga ega emas. U qiyin sharoitlarda ham yashovchanligini saqlashi uning genetik va o'ziga xos fiziologik xususiyatlari bilan bog'liq.

Adabiyotlar tahlili va metodologiya Ba'zi vaqtlarda *Bacillus safensis* va *Bacillus pumilus* adashtirilib yuboriladi. *Bacillus safensis* o'simliklarda o'sishni yaxshilovchi omil sifatida ahamiyatga egadur, shuningdek, u turli sanoat fermentlari,

ikkilamchi metabolitlarni ishlab chiqarish xususiyatiga ham ega ekanligi bilan biotexnologik qiymatga ega. Bulardan atshqari, *Bacillus safensis* xavfsiz sanoat bakteriyasi hisoblanadi, chunki unda patogenlik aniqlanmagan. *Bacillus safensis* gramm-musbat, spora hosil qiluvchi, aerob va fakultativ-geterotrof bakteriya hisoblanib, tayoqchasimon shakldagi, harakatchan, tuzlar, ultrabinafsha nurlari, turli og'ir metallar ta'siriga bardoshlilik xususiyatiga ega. Uning keng arealda tarqalganligini ko'rish mumkin, jumladan sho'rlangan cho'l, neft ilan ifloslangan joylarda ham uchratish mumkin. *Bacillus safensis* shtammlari sellyuloza, proteaza, lipaza, kisilaza, inulinaza, keratinaza, b-galaktosidaza kabi bir qancha sanoat fermentlarini ishlab chiqarish xususiyatiga ega.

Natija va muhokama O'simliklarni o'stiruvchi omil sifatida ishtirok etishi, bio-nazorat agentlari, protobiotnik xususiyatlarikabi xususiyatlari uni biotexnologik qobiliyatini ulkan darajada ekanini belgilab beradi. *Bacillus safensis* ustida o'tkazilgan bir qancha tadqiqotlar uning biokimyoviy xususiyatlarini o'rganishga qaratilgan bo'lib, uni oksidaza, ishqoriy fosfataza, b-galaktozidaza, katalaza kabi ferment analiz teslaridan o'tkazilgan indol, amilaza, leysinearilamidaza, sistinarilamidaza, valinearilamidaza, tripsinga salbiy, triptofan deaminaza, a-galaktosidaza, fenilalani deaminaza, arginin dihidrolaza, lizin dekarboksilaza, agaraza, lesitinaza, ureaza, nitratlarni kamaytirish, ornitin dekarboksilaza kabi ferment analiz testlaridan o'tkazilgan. Ushbu ko'rsatkiklar *Bacillus safensisning* biotexnologik potensialini belgilashda muhim ahamiyatga ega. Shu sababli ham *Bacillus safensisning* bir qancha faol shtammlari o'ziga xos xususiyatlarga ega ekanligi va metabolitlar ishlab chiqarishi biotexnologik ahamiyat kasb etadi. Endofitlar o'simliklarda yashashi natijasida o'simlik bilan doimiy aloqada bo'ladi va bu orqali o'zining xususiyatlarini namoyon qiladi. Ba'zi endofitlar o'zidan fitopatogenlarga qarshi metaboloitlar ishlab chiqaradi va o'simlikni himoya mexanizmlarida ulkan ahamiyat kasb etadi. *Bacillus safensis* barqaror bioagent sifatida qishloq xo'jaligida katta ahamiyatga ega ekanligi isbotlandi.

Xulosa *Bacillus safensisning* o'sishni yaxshilash xususiyati, suv tanqisligiga bardoshlili oltita bug'doy navida o'rganilgan. Bundan tashqari uning turli fermentatsiya jarayonlarida ishtirok etishi aniqlangan. *Bacillus safensis* shtammlari faol ferment ishlab chiqarish xususiyatiga ega bo'lganligi sababli, biotexnologiya sanoatida fermentlarning tabiiy manbaasi sifatida qadrlanadi. *Bacillus safensis* shtammlari amilaza, lipaza, proteaza, sellyuloza, proteaza, xitinaza, inulinaza, keratinaza va b-galaktosidaza kabi fermentlarning manbaasi bo'lib hisoblanadi. Bugungi kunda sanoat tarmoqlari kuchli rivojlanganligi sababli atrof-muhitga zaharli chiqindilar ko'p

miqdorda ajralishi va og‘ir metallar bilan ifloslanish oshib bormoqda, buni bir qancha oldini olish usullari bilan birgalikda, mikrobiologik usullar ham katta foyda keltiradi va bunda *Bacillus* avlodi vakillari faol ishtirok etadi. Jumladan, *Bacillus safensis*, *Bacillus licheniformislar* bo‘lib, *Bacillus tequilensis* erkin sianidni samarali biriktirib olish xususiyatiga ega. Ushbu bakteriyaning biotexnologik ahamiyatida ikkilamchi metabolitlarning qiymati juda ham kattadir. Bundan tashqari, olimlar ushbu bakteriyaning organizmni himoya qilish qobiliyatini ham ko‘rsatib o‘tganlar.

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