BUG‘DOYNING *T.BOEOTICUM* BOISS DIPLOID TURI NAMUNALARI ISHTIROKIDA OLINGAN TURLARARO F_2 DURAGAYLARIDA CHANGCHILARNING FERTILLIGI

Seytnazarova Tillakhan Elmuratovna,
Tog‘anov Jamilbek Shuxrat o‘g‘li
Ro‘zieva Mexriniso Raxmonkulovna
O’simliklar genetik resurslari ilmiy-tadqiqot instituti
seytnazarovatillahan@gmail.com

ANNOTATSIYA

Tadqiqotlarda bug‘doyning *T.boeoticum* Boiss va *T.aegilopoides* turi namunalari ishtirokida jami 10 ta kombinasiya bo‘yicha chatishtirishlar olib borilgan. F_1 o‘simliklar 4 ta kombinasiyada o‘sib chiqdi, 1 ta kombinasiyada bo‘lsa to‘liq sterillik kuzatildi. F_2 avlodda 4 duragay kombinasiyadan 2 tasidan o‘simliklar o‘sib chiqdi, 2 kombinasiyada to‘liq sterillik kuzatildi. F_2(*T.boeoticum pseudo-boeoticum*) x (*T.aestivum* L) L-3; F_2(*T.aegilopoides*) x (*T.aestivum* L) L-20 duragay kombinasiyalarida changchilarning fertilligi mos ravishda 82,4 va 84,5% ni tashkil etdi. Mazkur duragay kombinasiyalarda F_2 avlodda F_1 ga nisbatan changchilarning fertilligi yuqorilaganini ko‘rishimiz mumkin.

Kalit so‘zlar: *T.boeoticum* Boiss, *T.aegilopoides, T.aestivum,* changchilarning fertilligi, atsetokarmin.

ANNOTATION

In the study, a total of 10 combinations of *T.boeoticum* Boiss and *T.aegilopoides* wheat were crossed. F_1 plants were grown in 4 combinations and complete sterility was observed in 1 combination. In the F_2 generation, plants were grown in 2 of the 4 hybrid combinations and complete sterility was observed in 2 combinations. In the hybrid combinations (*T.boeoticum pseudo-boeoticum*) x (*T.aestivum* L) L-3; *(T.aegilopoides*) x (*T.aestivum* L) L-20, pollen fertility was 82.4 and 84.5%, respectively. In these hybrid combinations, we see that pollen fertility in the F_2 generation has increased compared to F_1.

Keywords: *T.boeoticum* Boiss, *T.aegilopoides, T.aestivum, pollen fertility, acetocarmine.*

KIRISH

Butun dunyo buylab kuzatilayotgan glabol iklim sharoitining o‘zgarishi qishloq xo‘jaligi ekinlarining stress omillarga jumladan, issiqlikga, tuproq sho‘rlanishiga, qurg‘oqchilikga

chidamli navlarini yaratishni taqoza etmoqda. Ma'lumki, qishloq xo‘jaligi ekinlarining yovvoyi va yarim yovvoyi turlari stress omillarga chidamligi bilan noyobdir. Yovvoyi turlar irsiy potensialidan seleksiyada foydalanishni cheklovchi yagona omil diploid turlar genetik materialning madaniy navlarga introgressiyasi bo‘lib qolmoqda.

T.boeoticum Boiss (AbAb, 2n = 2x = 14) ko‘k aleyron (Ba2) qatlami bilan nazorat qilinadigan, donning ko‘klik belgisi manbalaridan biridir. Oddiy bug‘doy navlari donning ko‘klik belgisini o‘zida saqlamaydi, lekin ushbu belgi ayrim Triticeae turlari bilan chatishtirib, ko‘k aleyron qatlamini unga o‘tqazish mumkin (Bureshova va boshq., 2015).

Ko‘k aleyron belgisini belgilovchi bir nechta genlar Triticeae turining 4 ta gomeologik guruhidan bug‘doyga o‘tkazilgan (Burešová et al., 2015). *Triticum boeoticum* va *Triticum monococcum* turlaridan kelib chiquvchi Va2 geni 4Ab yoki 4Am xromosomalarining uzun elkasida joylashgan. (Zeller et al., 1991; Zeven, 1991; Dubkovskiy va boshq., 1996; Singx va boshq., 2007).

ADABIYOTLAR TAHLILI VA METODOLOGIYA

Rangli donli bug'doy inson salomatligi uchun ideal oziq-ovqat hisoblanadi va oziq-ovqat ishlab chiqaruvchilari va tadqiqotchilarning qiziqishini kuchaytirmoqda. Urug' qobig'ida antosiyaninlarni to'playdigan binafsha rangli bug'doydan farqli o'laroq, ko'k bug'doy aleyron qatlamida antosiyaninlarni to'playdi. (Abdel-Aal and Hucl, 2003; Abdel-Aal et al., 2006). Bundan tashqari, binafsha va ko'k bug'doyni qora bug'doy (BW) hosil qilish uchun chatishtirish mumkin, qaysiqi ozuqaviy va bioaktiv birikmalarga boy bo‘lgan, sog'lom funktsional oziq-ovqatlarni ishlab chiqish uchun imkon beruvchi (Dhua va boshq., 2021). Antosiyaninlar inson ratsionining muhim tarkibiy qismi bo'lib, sabzavot va mevalarda keng tarqalgan. Ular inson salomatligida yallig'lanishga qarshi, antioksidant, saratonga qarshi va diabetga qarshi vositalar sifatida muhim rol o'ynaydi (Shipp va Abdel-Aal, 2010).

*T.boeoticum b*archa tabiiy namunalari va uning madaniy turi *T.monococcum* ko‘k aleyron belgisini belgilovchi BA2 geni mavjudligi aniqlangan. Bugungi kungacha bug‘doyning BA2 genini o‘zida saqlovchi bitta ham sintetik nav yaratilmagan. Bu esa *T.boeoticum* turi genetik materialining yumshoq bug‘doy genomiga introgressiyasi yahamiyatini yana ham oshiradi.

Sitogenetik tahlillar Z.P.Pausheva “Praktikum po sitologii rasteniy” (1974) metodik qo‘llanmasi asosida olib borildi. Changchilarning fertilligi NLCD-307B mikroskopida 10x40 kattalikda aniqlandi. Changchilarning fertilligi o‘simliklarning gullash davrida olib borildi. Changchilar 2% atsetokarmin bilan buyyaldi va 1 kun davomida muzlatkichda saqlandi. 2 tuxum va vegetativ hujayra mavjud bo‘lgan, to‘q pushti rangli, donodor

sitoplazmali changchilar fertil changchilar guruhiga kiritildi. Buyalmagan changchilar pushsiz changchilar guruhiga kiritildi.

NATIJALAR

Oldingi tadqiqotlarda bug‘doyning *T.boeoticum* Boiss va *T.aestivum* turi namunalari ishtirokida jami 10 ta kombinasiya bo‘yicha chatishtirishlar olib borilgan. Chatishtirishlar resiprok usulda olib borilib, (*T.aestivum*) x (*T.boeoticum*) sxemasi bo‘yicha duragay urug‘lar olinmagan. (*T.boeoticum*) x (*T.aestivum*) sxemasi bo‘yicha 5 ta duragay kombinasiyadan F_0 urug‘lari olingan. F_1 o‘simliklar 4 ta kombinasiyada o‘sib chiqdi, 1 ta kombinasiyada bo‘lsa to‘liq sterillik kuzatildi.

1 jadvalda F_1 va F_2 o‘simliklarida changchilarning fertillik darajasi keltirilgan. F_1(*T.boeoticum*) x (*T.aestivum* L) L-17 duragay o‘simlikda changchilarning fertillik darajasi 20,5% ni, F_1(*Triticum boeoticum var.pseudo-boeoticum*) x (*T.aestivum* L) L-3 kombinasiyasida 19,3% ni, F_1(*Triticum boeoticum var.virido-boeoticum*) x (*T.aestivum* L) L-19 kombinasiyasida 22,2% ni, F_1(*T.aegilopoides*) x (*T.aestivum* L) L-20 kombinasiyasida 16,6% ni tashkil etgan bo‘lsa, F_1(*Triticum boeoticum*) x (*T.aestivum* L) L-3 kombinasiyasi bo‘lsa to‘liq sterillikni namoyon etib, urug‘lardan o‘simliklar o‘sib chiqmadi. Changchilar fertilligining bunday past bo‘lishi duragaylarda xromosoma kon'yugasiyasining to‘liqsizligidan dalolat beradi. Olingan F1 o‘simlik boshoqlarida juda kam don shakllanishi kuzatildi.

MUHOKAMA

F_2 avlodda 4 duragay kombinasiyadan 2 tasidan o‘simliklar o‘sib chiqdi 1-rasm, 2 kombinasiyada to‘liq sterillik kuzatildi. Olingan duragay kombinasiyalarda changchilarning fertillik darajasi o‘rganildi. Asosiy maqsad esa *T.aestivum* genomiga *T.boeoticum* Boiss genetik materialining introgressiyasi hisoblanadi. (*T.boeoticum*) x (*T.aestivum* L)L-17; (*T. boeoticum var.virido-boeoticum*) x (*T.aestivum* L) L-19 duragay kombinasiyalarida to‘liq sterillik holati kuzatildi. (*T.boeoticum pseudo-boeoticum*) x (*T.aestivum* L) L-3; (*T.aegilopoides*) x (*T.aestivum* L) L-20 duragay kombinasiyalarida changchilarning fertilligi mos ravishda 82,4 va 84,5% ni tashkil etdi. Mazkur duragay kombinasiyalarda F_2 avlodda F_1 ga nisbatan changchilarning fertilligi yuqorilaganini ko‘rishimiz mumkin.

XULOSA

Тадқиқотлар натижасида (*T.boeoticum pseudo-boeoticum*) x (*T.aestivum* L) L-3; (*T.aegilopoides*) x (*T.aestivum* L) L-20

duragay kombinasiyalarida changchilarning fertilligi mos ravishda 82,4 va 84,5% ni tashkil etdi. Mazkur duragay kombinasiyalarda F_2 avlodda F_1 ga nisbatan changchilarning fertilligi yuqorilaganini ko‘rishimiz mumkin.



1-rasm. Bug‘doyning *T.boeoticum* Boiss va *T.aegilopoides* turi namunalari ishtirokida olingan duragay o‘simliklar.

***T.boeoticum* Boiss** ва ***T.aegilopoides* namunalari ishtirokida olingan F_1, F_2 duragaylarida changchilarning fertilligi,%**

T/r	**Duragaylar**	**F_1**	**F_2**

		O‘rganilgan changchilar miqdori	Fertil changchilar miqdori	Steril changchilar miqdori	Fertil changchilar foizi	O‘rganilgan changchilar miqdori	Fertil changchilar miqdori	Steril changchilar miqdori	Fertil changchilar foizi
1	(*T.boeoticum)* x (*T.aestivum*L)L-17	175	139	36	79,4	Steril	-	-	-
2	(*T.boeoticum pseudo-boeoticum)* x (*T.aestivum* L) L-3	191	154	37	80,6	364	300	64	82,4
3	(*T. boeoticum var.virido-boeoticum)* x (*T.aestivum* L) L-19	162	126	36	77,7	Steril	-	-	-
4	(*T.aegilopoides)* x (*T.aestivum* L) L-20	198	165	33	83,3	243	205	38	84,5
5	(*T.boeoticum)* x (*T.aestivum* L) L-3	Steril	-	-	-	-	-	-	-
6	Andoza Tezpishar navi	378	378	0	100	424	420	4	99,0

REFERENCES

1.Burešová, V., Kopeckı, D., Bartoš, J., Martinek, P., Watanabe, N., Vyhnánek, T., et al. (2015). Variation in genome composition of blue-aleurone wheat. *Theor. Appl. Genet.*128, 273–282. doi: 10.1007/s00122-014-2427-3

2.Zeller, F. J., Cermeno, M. C., and Miller, T. E. (1991). Cytological analysis on the distribution and origin of the alien chromosome pair conferring blue aleurone color in several European common wheat (*Triticum aestivum* L.) strains. *Theor. Appl. Genet.* 81, 551–558. doi: 10.1007/BF00219448

3.Zeven, A. C. (1991). Wheats with purple and blue grains: a review. *Euphytica* 56, 243–258. doi: 10.1007/BF00042371

4.Dubcovsky, J., Luo, M. C., Zhong, G. Y., Bransteitter, R., Desai, A., Kilian, A., et al. (1996). Genetic map of diploid wheat, *Triticum monococcum* L., and its comparison with maps of *Hordeum vulgare* L. *Genetics* 143, 983–999.

5.Singh, K., Ghai, M., Garg, M., Chhuneja, P., Kaur, P., Schnurbusch, T., et al. (2007). An integrated molecular linkage map of diploid wheat based on a *Triticum boeoticum*×*T. monococcum* RIL population. *Theor. Appl. Genet.* 115, 301–312. doi: 10.1007/s00122-007-0543-z

6.Abdel-Aal, E. S. M., and Hucl, P. (2003). Composition and stability of anthocyanins in blue-grained wheat. *J. Agric. Food Chem.* 51, 2174–2180.

7.Abdel-Aal, E. S. M., Young, J. C., and Rabalski, I. (2006). Anthocyanin composition in black, blue, pink, purple, and red cereal grains. *J. Agric. Food Chem.* 54, 4696–4704. doi: 10.1021/jf0606609

8.Dhua, S., Kumar, K., Kumar, Y., Singh, L., and Sharanagat, V. S. (2021). Composition, characteristics and health promising prospects of black wheat: a review. *Trends Food Sci. Technol.* 112, 780–794. doi: 10.1016/j.tifs.2021.04.037

9.Shipp, J., and Abdel-Aal, E. S. M. (2010). Food applications and physiological effects of anthocyanins as functional food ingredients. *Open Food Sci. J.* 4, 7–22. doi: 10.2174/1874256401004010007