# BÖLÜM 6

# MAŞ FASULYESİNDE MUTASYON ISLAHININ ÖNEMİ VE UYGULAMALARI

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## GİRİŞ

Tarım, iklim değişikliği, nüfus artışı, arazilerin küçülmesi ve doğal kaynakların tükenmesi gibi etmenlerin birleşimiyle, küresel gıda ve beslenme güvenliğini tehdit eden ciddi zorluklar altındadır. Bu bağlamda bitki ıslahı, verimliliği sürdürülebilir bir şekilde artırmak, kalite özelliklerini iyileştirmek, biyotik ve abiyotik streslere karşı dayanıklılığı artırmak için temel bir strateji olmaya devam etmektedir (1, 2). Geleneksel ıslah yaklaşımları, temel teşkil etse de, özellikle kendine tozlaşan bitkilerde ve gen havuzları kısıtlı olan baklagillerde, mevcut genetik değişkenliğe ve uzun ıslah döngülerine olan bağımlılıkları nedeniyle sınırlı düzeyde kalmaktadır (3). Ayrıca, geleneksel melezleme ve seleksiyon yöntemlerinin etkinliği, genetik çeşitliliği dar olan veya doğal rekombinasyonun sınırlı olduğu bitkilerde azalma eğilimindedir. Bu durum, yeni ve hedefe yönelik genetik varyasyonlar üretebilen alternatif stratejilerin geliştirilmesine olanak sağlamaktadır (4). Mutasyon ıslahı, genel genomik bütünlüğü koruyarak üstün ve istenen özelliklerin kazandırılmasına olanak tanıyan; aynı zamanda gizli

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genel genetik altyapısını bozmadan erkencilik, hastalık direnci ve abiyotik stres toleransı gibi belirli özelliklerin hedefli olarak iyileştirilmesini sağlamaktadır. Son yıllarda, gama ışınları ve EMS gibi mutajenler kullanılarak maş fasulyesinde çok sayıda başarılı mutant hattı geliştirilmiş ve bu yöntem, hem verim hem de kalite kısıtlamalarını ele alma potansiyelini göstermiştir. Ancak bu potansiyel, çeşitli biyolojik, teknik ve kurumsal zorluklarla dengelenmektedir. Bunlar arasında, yararlı mutasyonların tespiti ve mutajen dozlarının optimize edilmesi, seleksiyon aşamalarındaki ayrıntılı incelemeler ve mutantların ticari çeşit olarak kullanılmasına kadar geçen sürede karşılaşılan zorluklar yer almaktadır.

Maş fasulyesinde mutasyon ıslahının geleceği, genotipik, fenotipik ve dijital tarımla stratejik entegrasyonuna bağlıdır. Markör destekli tarama yöntemleri, mutasyona uğrayan alellerin hassas bir şekilde tanımlanmasını ve doğrulanmasını sağlayacaktır. Mutasyon ıslahını yabani akrabaların zengin çeşitliliğiyle birleştirmek ıslahçıların kullanabileceği genetik tabanı daha da genişletecektir. Mutasyon ıslahı yalnızca geleneksel ve transgenik ıslah yöntemlerine pratik bir alternatif değil, aynı zamanda yemeklik baklagil ıslahında önemli bir stratejidir. Etkili bir şekilde kullanıldığında, iklim dostu tarımın ve küresel gıda güvenliğinin değişen taleplerini karşılayan dayanıklı, yüksek verimli ve besin değeri artırılmış maş fasulyesi çeşitlerinin geliştirilmesine önemli ölçüde katkıda bulunabilir.

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