UNRAVELING THE DYNAMICS OF SEED LONGEVITY: FROM DORMANCY TO GERMINATION

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The article's aims are to be a comprehensive exploration of factors influencing seed longevity, emphasizing the importance of seed viability for future plant generations, biodiversity conservation, and agricultural productivity. It covers topics related to seed biology, storage conditions, the impact of reactive oxygen species (ROS) and reactive nitrogen species (RNS), the role of seed-associated microbiomes, DNA damage, genetic factors affecting longevity, and the intricate processes involved in seed germination. The discrepancies between artificially aged seeds and those aged naturally in ambient and long-term genebank conditions are discussed, underlining the importance of studying long-term stored seeds to identify genetic markers associated with seed longevity accurately and highlighting the application of genome-wide association studies (GWAS) in uncovering genetic factors.

Key words: *longevity, seeds, artificial and natural aging.*

РОЗКРИТТЯ ДИНАМІКИ ДОВГОВІЧНОСТІ НАСІННЯ: ВІД СТАНУ СПОКОЮ ДО ПРОРОСТАННЯ

Метою статті є всебічне дослідження факторів, що впливають на довговічність насіння, з акцентом на важливості життєздатності насіння для майбутніх поколінь рослин, збереження біорізноманіття та продуктивності сільського господарства. У ній розглядаються теми, пов'язані з біологією насіння, умовами зберігання, впливом активних форм кисню (ROS) та активних форм азоту (RNS), роллю мікробіомів, пов'язаних із насінням, пошкодженням ДНК, генетичними факторами, що впливають на довговічність, та складними процесами, що відбуваються під час проростання насіння. Обговорюються розбіжності між штучно зістареним насінням та тим, що природно старіє в умовах навколишнього середовища та довгострокового зберігання в генних банках, підкреслюючи важливість вивчення насіння, що зберігається впродовж тривалого часу, для точної ідентифікації генетичних маркерів, пов'язаних із довговічністю насіння, та висвітлення застосування повногеномних асоціативних досліджень (GWAS) для виявлення генетичних факторів.

Ключові слова: довговічність, насіння, штучно викликане й природне старіння.

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