IMPROVING SALT TOLERANCE IN *TRIFOLIUM ALEXANDRINUM* L. THROUGH INTERSPECIFIC HYBRIDIZATION, POLYPLOIDIZATION AND INDUCED VARIATIONS

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Soil salinity significantly affects crop productivity throughout the world. Improving intrinsic salt tolerance of the plants may effectively improve productivity. In vitro evaluation is an effective and quick method allowing utilization of inter and intra genotypic variation in a controlled environment. Trifolium alexandrinum is one of the most important winter season annual fodder crop in India and Mediterranean region. Diverse T. alexandrinum genotypes were evaluated in vitro for salt tolerance. Intra and inter genotypic variability was observed for response to varying levels of salt stress at different growth stages. Germination was adversely affected with increasing salt stress among genotypes, however, three genotypes EC 318954, ISH 34/41, ISH 34/8Y showed 75–80 % germination even at 0.75 % salt level. High seedling mortality was observed at higher salinity levels except EC 318954 which showed low mortality at 0.50 and 0.75 % salinity. Seedlings with normal root growth ranged from 5 to 80 % at 0.25 and 0.5 % salinity. Based on average Salinity Susceptibility Index (SSI) the ISH progenies were most tolerant (SSI = 0.895) for germination as well as radicle and plumule length, number of leaves and plant weight (SSI = 0.91). ISH progenies, tetraploids, Fahli ecotype and multifoliate showed better tolerance. The study confirmed successful transfer of salinity tolerance from T. apertum to T alexandrinum. The petiole and hypocotyl explants at moderate salinity and petiole explants at high salinity responded well for in vitro callusing. Calli developed at 0.75 % salinity can be a source of developing tolerant lines through natural cell line selection. Embryo culture response of Mescavi genotypes was better than Fahli and Saidi genotypes.

Key words: *Egyptian clover, ecotypes, tetraploid, interspecific cross, multifoliate.*

ПОКРАЩЕННЯ СОЛЕСТІЙКОСТІ *TRIFOLIUM ALEXANDRINUM* L ЗА ДОПОМОГОЮ МІЖВИДОВОГО СХРЕЩУВАННЯ, ПОЛІПЛОЇДИЗАЦІЇ ТА ІНДУКОВАНОЇ МІНЛИВОСТІ

Засолення ґрунтів має суттєвий вплив на продуктивність рослин у всьому світі. Вдосконалення природної солестійкості рослин може ефективно покращити продуктивність. *In vitro* оцінювання – це ефективний і швидкий метод, який дозволяє використовувати генотипну мінливість між видами та всередині виду у контрольованому середовищі. *Trifolium alexandrinum* є однією з найважливіших озимих однорічних кормових рослин в Індії та Середземноморському регіоні. Різноманітні генотипи *T. alexandrinum* оцінювали на предмет солестійкості *in vitro*. Генотипну мінливість між видами та всередині виду спостерігали для визначення реакції на різні рівні сольового стресу на різних етапах росту. Підвищення рівня сольового стресу між генотипами мало негативний вплив на проростання насіння, однак, три генотипи EC 318954, ISH 34/41, ISH 34/8Y продемонстрували 75–80 % проростання насіння навіть при рівні солі в 0,75 %. При вищих рівнях засолення спостерігали високий рівень загибелі саджанців, окрім EC 318954, який продемонстрував низький рівень загибелі при рівнях засолення в 0,50 та 0,75 %. Саджанці з нормальним ростом коренів були у діапазоні від 5 до 80 % при рівні засолення 0,25 та 0,5 %. За розрахунками середнього індексу сприйнятливості до засолення (SSI), потомство ISH продемонструвало найвищий рівень стійкості (SSI = 0,895) щодо проростання насіння, а також довжини зародкового корінця і зародкової бруньки, кількості листочків і ваги рослини (SSI = 0,91). Потомство ISH, тетраплоїди, екотип Fahli та багатолисткові продемонстрували вищу стійкість. Дослідження підтвердило успішне перенесення солестійкості від *T. apertum* до *T alexandrinum*. Експланти живців і гіпокотиля при помірному засоленні та експланти живців при високому рівні засолення позитивно відреагували на калюсогенез *in vitro*. Калюси, які розвинулись при засоленні в 0,75 %, можуть бути джерелом розробки стійких ліній за допомогою природної селекції клітинних ліній. Реакція ембріональної культури генотипів Mescavi була кращою, ніж генотипів Fahli і Saidi.

Ключові слова: єгипетська конюшина, екотипи, тетраплоїд, міжвидове схрещення, багатолисткові.

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