

**An efficient method in breaking of dormancy from *Bunium persicum* (Boiss) Fedtsch seeds: a valuable herb of Middle East and Central Asia**

ABSTRACT

Objective: To develop a protocol for breaking of seed dormancy and increasing the seed germination rate of *Bunium persicum*. Methods: The seeds were treated with 3.1, 6.3, 12.5, 25, 50 and 100  $\mu\text{mol/L}$  of benzyl aminopurine, gibberellic acid (GA3), thidiazuron (TDZ) and forchlorfenuron. Then, seeds were transferred to two different temperature conditions including room temperature (25 °C) and chilling temperature (2-5 °C). Results: The treatment of moist seeds with chilling temperature (2-5 °C) broke seed dormancy and showed maximum germination, which was 54.7% after 60 d treatment. Also, the treatment of dry seeds with chilling temperature broke seed dormancy with 9.3% germination rate after 120 d. Treatment of seeds with different level of plant growth regulators showed that under moist-room condition, there was evidence of higher and lower seed germination rate: GA3 (100  $\mu\text{mol/L}$ ) with 46.7% and TDZ (50  $\mu\text{mol/L}$ ) with 6.67% respectively. In addition, the results showed that under moist-chilling condition, TDZ (6.3  $\mu\text{mol/L}$ ) with 53.3% seed germination rate had higher influence on breaking seed dormancy. Treatment of seeds with combination of TDZ and GA3 under moist-chilling condition revealed higher rate of breaking of seed dormancy when 6.3  $\mu\text{mol/L}$  TDZ was combined with 100  $\mu\text{mol/L}$  GA3, showing 93.7% germination rate. Conclusions: The effect of plant growth regulators coupled with chilling temperature on breaking of seed dormancy could provide a large number of seedlings while the long juvenile time which is the next restricting factor of plantation still remained. Thus, the subsequent growth of seedlings to provide a large number of corms is necessary for successful plantation.

**Keyword:** *Bunium persicum*; Seed germination; Thidiazuron; Benzyl aminopurine; Gibberellic acid 3; Forchlorfenuron; Chilling temperature