https://doi.org/10.7250/CONECT.2023.070

REVIEW ON SUSTAINABLE CRYOPRESERVATION AND NONFREEZING STORAGE SOLUTIONS OF EUROPEAN HONEYBEE *APIS MELLIFERA* DRONE SEMEN

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Abstract – The European honeybee *Apis mellifera* is the main pollinator for most crops used for human consumption. However, a number of diseases, parasites, pesticides and other factors that generally result in the widely described colony collapse disorder weakens honeybee colonies. In order to maintain the existing honeybee germ lines and facilitate the creation of new disease-resistant lines, it is necessary to ensure consistent breeding work, which would also allow the long-term preservation of the unique germplasm lines. One of the most promising solutions for the preservation of honeybee germplasm is the storage of honeybee drone semen. In recent decades, there has been a renewed interest in the preservation of honeybee drone semen using both cryopreservation and non-freezing storage methods. This review looks at the latest developments in novel sperm storage technologies and compares them to well-known preservation solutions. Additionally, the most accessible and widely used solutions will be reviewed, taking into account the cost of the necessary equipment, the complexity of the methods, time consumption and resulting sperm quality.

Keywords – Honeybee drone semen; instrumental insemination; low cost laboratory setup; non-freezing semen preservation; semen cryopreservation