

**POLLEN ANALYSIS OF THE ENDEMIC *PAEONIA PEREGRINA* MILL.
THROUGH LIGHT MICROSCOPY TECHNIQUE**

Enache Monica^{1*}, Hangan Marius¹, Dănăilă-Guidea Silvana Mihaela¹

¹ University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Marasti Blvd, District 1,
Bucharest, Romania

* Correspondence author. E-mail: monica.enache@biotehnologii.usamv.ro

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ABSTRACT

Pollen of Paeonia peregrina Mill. from Tulcea County was analysed on fresh mounts using light microscopy and the results were compared to the descriptions found in the literature. The microscopic images showed tricolpate, isopolar, medium size, suboblate pollen grain with a reticulate pattern on the surface.

INTRODUCTION

Paeonia peregrina Mill. (in old classifications *Paeonia peregrina* var. *romanica* was also used, but it is no longer valid) (Ciocârlan, 2009) is a herbaceous perennial, growing endemic in South-Eastern Europe including in several areas of Dobrogea, Muntenia and Southern Moldova in Romania (Figure 1). In Dobrogea, it is found in Murfatlar, the area between Tuzla and Mangalia, Babadag, Baia, Niculițel, the area between Agighiol and Mihail Kogălniceanu (Pârvu, 1991).



Figure 1. (a), (b) Mature plants of *Paeonia peregrina* at „Dimitrie Brandza” Botanical Garden of the University of Bucharest (May 2021)

Paeonia peregrina Mill. (the Romanian peony, forest peony – since it grows in forest clearings and edges in the steppe) and *Paeonia tenuifolia* (the steppe peony) as well as the other spontaneous peony species, were placed on the Red list of plants of the Institute of Biology of the Romanian Academy (Oltean et al., 1994) and are therefore protected by law in their natural habitat. Because of their beauty and large popularity in the whole country, as well as their presence in many local traditions and culture, the peony was proposed to become the Romanian national flower in 2013 during the „Agriculture for Life, Life for Agriculture” International Conference of the University of Agricultural Sciences and Veterinary Medicine of Bucharest (Toma et al., 2013), location that holds one of the most beautiful peony collection in the country (Figure 2).

In the present study pollen of *Paeonia peregrina* was analysed using light microscopy and the results were compared to the descriptions found in the literature (Stebler, 2021, Tarnavschi et al., 1990).

MATERIALS AND METHODS

Pollen was obtained from a *Paeonia peregrina* Mill. plant grown in a garden in Cataloi Village, Frecăței Commune in Tulcea County (South-East Romania) in May 2019 (Figure 3). The study was conducted at the Laboratory of Biology of the Faculty of Biotechnologies of the University of Agronomic Sciences and Veterinary Medicine of Bucharest where it was analysed using wet mounts (toluidine blue was added for better contrast) in June 2019. A Micros Austria optical microscope with ocular micrometer was used, the calibration ratio was 1 μm for objective 100 \times . Microscopic images have been photographed with a Sony Cyber-shot® digital camera (Carl Zeiss Vario-Tessar 5 \times zoom lens).



Figure 2. Peony collection at USAMV Bucharest (May 2020)



Figure 3. *Paeonia peregrina* in Cataloi Village, Tulcea County (Romania) – garden grown

RESULTS AND DISCUSSIONS

Light microscopy images of *Paeonia peregrina* pollen showed tricolpate, isopolar, medium size, suboblate pollen grain with a reticulate pattern on the surface (Figures 4-8). Exine thickness is about 2 μm .

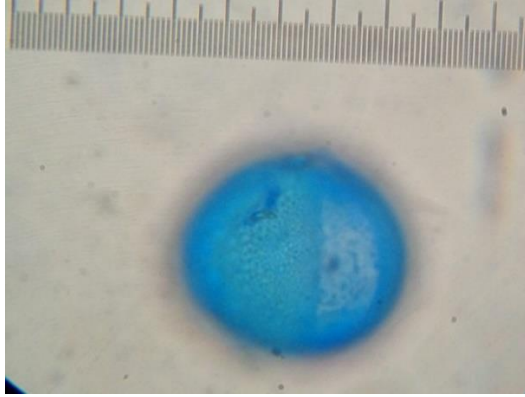


Figure 4. *Paeonia peregrina* pollen grain in equatorial view (ob. 100 \times)

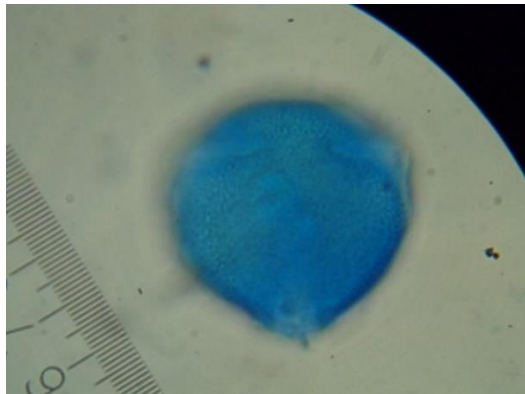


Figure 5. *Paeonia peregrina* pollen grain in semi-polar view (ob. 100 \times)

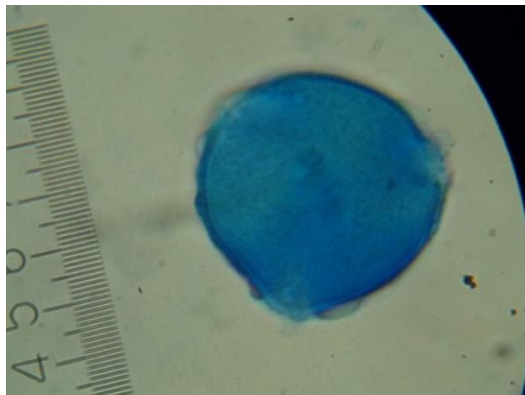


Figure 6. *Paeonia peregrina* pollen grain in semi-polar view – optical section (ob. 100 \times)

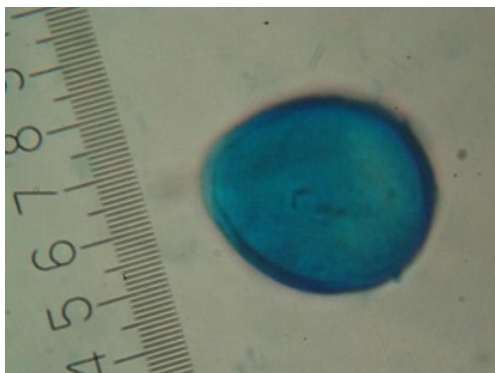


Figure 7. *Paeonia peregrina* pollen grain in equatorial view – optical section (ob. 100x)

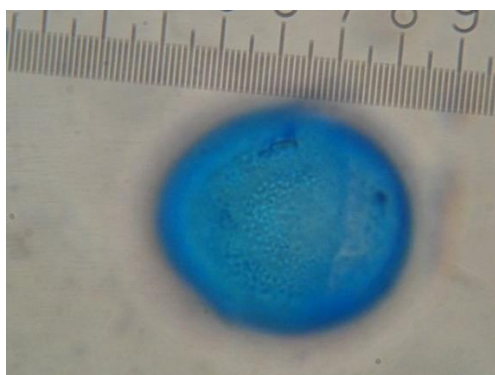


Figure 8. *Paeonia peregrina* pollen grain – exine surface (ob. 100x)

CONCLUSIONS

The morphological characteristics shown in the microscopic images of the *Paeonia peregrina* pollen correspond to the descriptions found in Tarnavschi et al. (1990) and Stebler (2021), however, the latter found tricolporoidate pollen grain, but “pores are not always clearly defined” (Stebler, 2021).

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