

## Floral Origin of Different Bee Pollen Samples

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**Abstract.** Bee pollen is a beehive product obtained by honeybees from gathering millions of floral pollen grains and mixing it with plant nectar and bee saliva. Several laboratory techniques are used to prepare pollen grains for microscope observation and identification. Floral origin of ten bee pollen samples was identified by palynological analysis without acetolysis followed by microscopy and comparison with a library of samples. Reference pollen collection from collected flowers and different pollen guides were used for the recognition of the pollen type

**Keywords:** bee pollen, palynology, Nikon Eclipse 50i microscope, slide, pollen guide

**Introduction.** Bee pollen is a beehive product obtained by honeybees from gathering millions of floral pollen grains and mixing it with plant nectar and bee saliva (Cocan *et al.*, 2005). Several laboratory techniques are used to prepare pollen grains for microscope observation and identification (Barth *et al.*, 2010). The pollen grain features we examine are: size, shape, aperture numbers, aperture type, surface, exine, pollen colour (fresh, bee load): white to gray brown, red or pink, orange, yellow, green, blue to black (Sawyer, 2006).

**Aims and Objectives.** This study presents a fast and simple method used for botanical origin determination from bee pollen, adapted from Almeida-Muradian *et al.* (2005) and Louveaux *et al.*, (1978).

**Materials and Methods.** For the experiment were taken multifloral bee pollen. The pellets were grouped into sub-samples according to their colors (Almeida-Muradian *et al.*, 2005). After color separation 2-3 of pollen grains were put on a glass plate and some drops of 5‰ sulphuric acid was added. After homogenization, a microscopic slide was made for botanical origin identification, dried, colored, fixed with fuchsine gelatin glycerin and examined with Nikon Eclipse 50i microscope.

Reference pollen collection from collected flowers and different pollen guides were used for the recognition of the pollen type (<http://www.geo.arizona.edu/palynology>, <http://www-saps.plantsci.cam.ac.uk/pollen.htm>; Sawyer, 2006; Tarnavschi *et al.*, 1981, 1987).

**Results and Discussions.** After microscopic examination, images were compared with reference pollen collection in respect of shape and size. *Table 1* presents plant species and color of analyzed pollen loads.

Tab. 1

Color and botanical origin of analyzed bee pollen samples

Color	Family	Pollen species	Photo
light brown	<i>Rosaceae</i>	<i>Filipendula ulmaria</i>	Fig.1.1
red orange	<i>Asteraceae</i>	<i>Heliantus annuus</i>	Fig.1.2
yellow	<i>Asteraceae</i>	<i>Achillea millefolium</i>	Fig.1.3
red orange	<i>Asteraceae</i>	<i>Callendula officinalis</i>	Fig.1.4
orange	<i>Asteraceae</i>	<i>Taraxacum officinale</i>	Fig.1.5
dark yellow	<i>Brasicaceae</i>	<i>Brasica rapa</i>	Fig.1.6
yellow	<i>Fabaceae</i>	<i>Robinia pseudoaccacia</i>	Fig.1.7

light gray brown	<i>Salicaceae</i>	<i>Salix alba</i>	Fig.1.8
yellow	<i>Fabaceae</i>	<i>Medicago sativa</i>	Fig.1.9
red orange	<i>Asteraceae</i>	<i>Matricaria chamomilla</i>	Fig.1.10

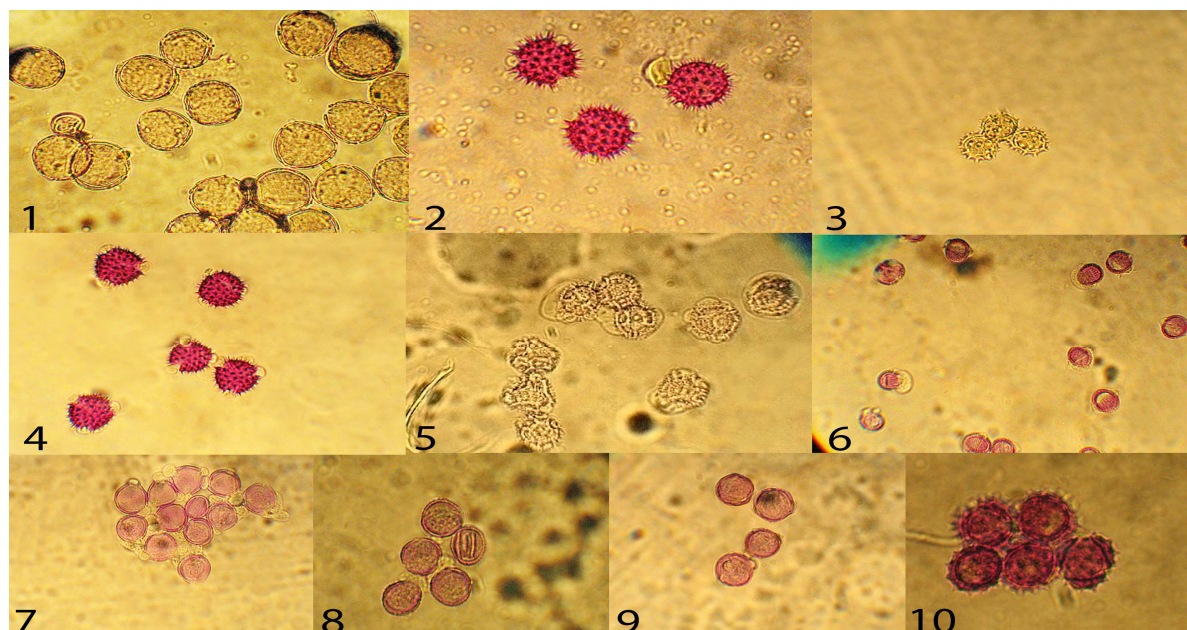


Fig. 1. Microscopic images of bee pollen samples studied (Tab. 1).

**Conclusion.** In the present research work, we demonstrated that the method described by Almeida-Muradian *et al.* (2005) and Louveaux *et al.* (1978) for melissopalynology can be applied for bee pollen with some modifications.

#### REFERENCES

1. Almeida-Muradian, L.B., L.C. Pamplona, S. Coimbra and O.M. Barth (2005). Chemical composition and botanical evaluation of dried bee pollen pellets. *Journal of Food Composition and Analysis* 18: 105-111.
2. Barth, O.M., A.S. Freitas, E.S. Oliveira, R.A. Silva, F.M. Maester, R.R.S. Andrella and G.M.B.Q. Cardozo (2010). Evaluation of the botanical origin of commercial dry bee pollen load batches using pollen analysis: proposal for technical standardization. *Anais de Academia Brasileira de Ciencias* 82(4): 893-902.
3. Cocan O., L. Al. Mărghitas, D. Dezmiorean, Laura Laslo (2005). Composition and biological activities of beepollen –review. *Bulletin USAMV-CN*, 61: 221-226.
4. Louveaux, J., Maurizio, Anna, Vorwohl, G. (1978). *Methods of melissopalynology*. *Bee world* 59: 139-157.
5. Sawyer, R. (2006). *Pollen identification for beekeepers*. Northern Bee Books, CLE Print Ltd, England.
6. Tarnavschi, I.T., G. Serbanescu-Jitariu, N. Mitroiu-Radulescu and D. Radulescu (1981). *Morfologia polenului florei din Romania, Vol I*, Ed. Academiei RSR, Bucuresti.
7. Tarnavschi, I.T., G. Serbanescu-Jitariu, N. Mitroiu-Radulescu and D. Radulescu (1987). *Morfologia polenului florei din Romania, Volumul II*, Editura Academiei Republicii Socialiste Romania, Bucuresti.
8. <http://www.geo.arizona.edu/palynology>
9. <http://www-saps.plantsci.cam.ac.uk/pollen/index.htm>