

# To bee or not to bee: the biology of bees and the biochemistry of honey Pollen guide for pollen analysis of different kinds of honey

Images from Pollen Wiki unless otherwise noted

Dandelion (Taraxacum officinale)

Pollen size: 28 microns (medium)

- Round to triangular; angular
- The pollen grain is covered with a net-like framework pierced with window-like openings
- Spikes on the outer pollen envelope
- Three elongated grooves (colpi) on the outer wall with one round pore per groove



Image: Sunasce007/Wikimedia, CC BY-SA 4.0





#### **False acacia (Robinia pseudoacacia)** Pollen size: 26–50 microns (medium)

- Triangular to roundish in section
- No appendages on the outer pollen wall (smooth envelope)
- Three elongated grooves (colpi) on the outer envelope that are at least twice as long as they are wide with frayed edges
- One round pore per groove on the outer shell
- Medium-sized polar field (*P*)
- *P*/pollen diameter = 0.25–0.5





Image: Pollinator/Wikimedia, CC BY-SA 3.0





## Large-leaved linden/lime (*Tilia platyphyllos*)

Pollen size: 32 microns (medium)

- Intense-yellow pollen
- Roundish shape
- Shape elements (reticulate to cracked structures) on the outer envelope
- Three short and narrow grooves (colpi) with one round pore per groove
- Large polar field (*P*)
- *P*/pollen diameter = 0.5–0.74



Image: Nickispeaki<u>/Wikimedia</u>, <u>CC BY-SA 3.0</u>





#### European chestnut (Castanea sativa)

Pollen size: 14.6-17.1 microns (small)

Appearance:

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• Triangular, elongated

Smooth pollen surface



- Round pores; pore radius approximately 2.0 microns
- Small polar field (*P*)
- *P*/pollen diameter = approx. 0.23
- Narrower towards the top and bottom (poles)



Image: Tatters/<u>Flickr</u>, <u>CC BY-SA 2.0</u>





## Lavender (Lavandula angustifolia)

Pollen size: 37 microns (medium)

- Elliptical to hexagonal in section
- Spherical to flattened sphere shape
- Net-like structure on the outer envelope
- An equatorial plane of symmetry is present
- Pollen grain usually has elongated grooves on the outer shell



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# Rapeseed/canola (*Brassica napus*)

Pollen size: 26 (22.3–28.2) microns (medium)

Appearance:

- Roundish in cross-section
- Round to slightly elongated sphere
- An equatorial plane of symmetry is present
- Thick outer skin
- Net-like structure on the outer envelope
- Pollen grain has three elongated grooves (colpi) on the outer shell
- Small to medium-sized polar field (*P*)
- – *P*/pollen diameter = approx. 0.21 (0.16–0.28)



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#### Citrus fruit (Citrus sp.)

Pollen size: 26-50 microns (medium)

Appearance:

- Brown colour
- Roundish to angular in cross-section
- Spherical or sphere-like shape
- Net-like structure on the outer envelope
- Pollen grain usually has four (rarely 5) elongated grooves on the outer shell
- Grooves run at regular intervals across the equatorial plane
- Partly oily, sticky drops of lipoids and carotenoids (these help stick the pollen grains to pollinators)



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#### Forest (honeydew) honey

Forest honey is a type of honey made not from flower nectar but honeydew, that is, the excretions of insects (e.g., aphids) that feed on plant sap or sugary secretions from living plant parts.

#### Appearance:

Pollen against a dense background of small crystals, yeasts, and other fungi (e.g., sooty mould) is characteristic of honeydew



Honeydew-producing aphids from the genus *Cinara* on a spruce shoot Image: Frank Mikeley/<u>Wikimedia</u>, <u>CC BY 2.5</u>

