

The ways in which the honey bee in Ireland is unique

Features of the native Irish Honey Bee (*Apis mellifera mellifera*)

Morphological Deviations

The **predominant morphological deviations** which identify the Irish *Apis mellifera mellifera* as a unique subspecies are its:

1. **smaller**
2. **hairier broad abdomen**
3. **shorter legs**
4. **proboscis**

when compared to other European populations of *Apis mellifera mellifera*.

It has been hypothesized that these **unique traits** of the species may have arisen through:

- **adaptations to the native Irish environment and climate.**
- **artificial selection (particularly in the area of *dark vs orange coloration* due to beekeeper's selection processes)**

Introgression - Queen vs. Queen

Research around **introgression in Ireland** suggests that non-native queens are **less of a threat to the fitness of native queens** compared to non-*Apis mellifera mellifera* drones in **preserving the unique traits of the Irish *Apis mellifera mellifera* for biodiversity.**

Colour Correlation

Most bee colonies submitted for testing in Ireland were black, reflecting the dominance of the native subspecies *Apis mellifera mellifera* **kept by most beekeepers**. Although increased sightings of coloured bees led to expectations of more variation, colour was often misinterpreted. **Ginger thoracic hair, tomentum, or small orange spots can resemble hybrid traits but also occur in pure native bees.** **Strong selection for dark colour persists**, consistent with local adaptation. Importantly, some genetically pure colonies show orange banding, indicating that **body colour and wing morphometrics cannot reliably detect low levels of genetic introgression.**

Measurement Characteristics

In looking at leg length it has been found that the Irish *Apis mellifera mellifera* possesses **significantly shorter legs** than those found in other subspecies of the European *Apis mellifera* species.

The forewing measurements were noted to be **longer in Irish bees** however a **resulting decreased cubital index** (a morphological measurement used to identify honeybee subspecies and detect hybridization) was also noted in the study referenced below.

Origin Story

Similarities within the *Apis mellifera mellifera* and *Apis mellifera iberiensis* have been hypothesised as supporting theories around the **origination of honey bees in Ireland as arising from an Iberian population transported to Ireland in the past.**

Thermal Adaptations

It has been put forward that a **smaller limb length of bees** may enable greater population densities within nests which in combination with **broader body diameters** may aid thermal regulation of the hive as an adaptation to a cool, damp climate.

Similarly, **longer overhair** may also be an adaptation linked to thermal regulation **improving species fitness** in the context of the cooler Irish climate when contrasted with other bee populations in Europe.

References

Valentine, A., Moro, A., Briggs, E., Collier, B., Sandoval, K., Binetti, C., ... McCormack, G. P. (2025). Introgressive hybridisation puts the distinctive population of *Apis mellifera mellifera* in Ireland at risk: evidence from a multidisciplinary approach. *Journal of Apicultural Research*, 64(1), 202–216.
<https://doi.org/10.1080/00218839.2024.2404297>