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Sustainable beekeeping in Biella (Piemonte, Italy): an area with flora not threatened by human impacts

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The Piedmont province of Biella, sandwiched between the Western Alps and the Po River valley, is unusual and diverse. Nearly 2% of its area is comprised of protected areas: Baragge are a relict heathland; Bessa is formed from debris of an ancient Roman gold mine; and Burcina Park is known for its rhododendrons. Historically, Biella was known for its rich textile industry. It has retained a wealth of natural forests and grasslands since ancient times and has proved to be suitable for beekeeping due to its mild climate and frequent precipitation that ensures continuous vegetative development. Beekeeping in the area, according to the Biella Beekeepers Association, includes 55 professional beekeepers and 3,579 bee hives, which are located mainly in the plains and low hills. An additional 199 amateurs and 1,127 registered hives exist mostly in the hills and low mountains.

Interest from the local government and beekeepers themselves allowed Ferrazzi and Ferrero to research the area's bee flora and the Biella honeys. The work has led the most typical honeys of the area to be distinguished by the Agriqualità label of the Piemonte Region, featuring PAT (Traditional Food Products).

The bee flora analysis was conducted through direct observations of honey bee foraging activity from 2006 to 2011. The honeys were evaluated from 140 samples submitted to melissopalynological, organoleptic, and physico-chemical (colour and moisture) analyses.

The spring blooms of *Taraxacum officinale*, *Salix* and many genera of wild and cultivated Rosaceae (*Prunus*, *Pyrus* and *Sorbus*) were found especially important. The most relevant flowering is represented by *Robinia pseudoacacia*; *Acer pseudoplatanus* is also a strong contributor. Herbaceous Leguminosae, such as *Trifolium repens* and *Lotus corniculatus* were always attended by honey bees. Widespread *Castanea sativa* was also found to be an important crop as was simultaneous-flowering *Rubus*. High altitude *Rhododendron ferrugineum* and *Epilobium angustifolium* are also excellent resources, the latter also present at low altitudes. A rare wild melliferous species, *Erica cinerea*, is located at Curino. Special crops such as *Polygonum fagopyrum* can also provide honey. Finally, *Solidago* and *Centaurea jacea* are important during the summer, while the later-flowering *Calluna vulgaris*, typical to Baragge, and *Reynoutria japonica*, found along roads and waterways, represented sources particularly useful to overwintering. The most common honeys of Biella Province are black locust, chestnut, decreased by gall wasp (*Dryocosmus kuriphilus*) damage, honeydew from *Metcalfa pruinosa*, and wildflowers. The quality of Biella honey is high, rooted in the care beekeepers extend to their colonies and the use of environmental friendly control methods, sanctioned by the Association, to reduce Varroa. As testament to the environmental health of the land, never has the area reported a neonicotinoid poisoning or registered a Biella bee or bee product critical situation. Due to integration of the pristine environment, rich floristic resources, and sustainable management of beekeeping, the Biella province is a privileged setting. From this emerges a mutual benefit between bees, beekeepers, and the territory that ensures a fundamental contribution of pollination and biodiversity by the insect to crop and wild plants.