

## BEES, APICULTURE AND THE NEW WORLD

### ABEJAS, APICULTURA Y EL NUEVO MUNDO

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#### Palabras clave adicionales

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#### SUMMARY

In the New World, some stingless bees were kept by the native population. In Central America, maya beekeepers worked with *Mellipona beecheii*, in Yucatan and adjacent regions. The arrival in North America of the first beehives was in 1691 and it were sent to Virginia by the Council of the Virginia Company in London.

Concerning the introduction to Central and South America the first ones arrived from Spain and Portugal towards the end of the 18<sup>th</sup> century, probably to Brazil. Prior to 1800, the european breeds taken to America were probably *Apis mellifera mellifera* and *Apis mellifera iberica*. At the turn of the century, a new european breed was imported from Italy (*Apis mellifera ligustica*).

American apiculture has used these breeds and crossbreeds virtually up to the present day. In 1956, tropical african queens of the breed *Apis mellifera scutellata* were introduced to Brazil. Its crosses involving european breeds gave rise to *africanized* bees, which have spread over almost the whole of South, Central and North America.

#### RESUMEN

Los nativos del Nuevo Mundo utilizaban algunas abejas sin aguijón. En América Central los apicultores mayas trabajaron, en el Yucatán y

regiones adyacentes, con *Mellipona beecheii*. La llegada a América del Norte de las primeras colmenas se produjo en 1691. Fueron enviadas a Virginia desde Inglaterra por la Virginia Company. Las primeras colmenas enviadas a América Central y del Sur, probablemente a Brasil, a finales del siglo XVIII, procedían de España y Portugal. Antes de 1800 las razas europeas llevadas a América fueron, probablemente, *Apis mellifera mellifera* y *Apis mellifera iberica*. A fin de siglo se introduce otra (*Apis mellifera ligustica*) procedente de Italia.

La apicultura americana ha empleado las razas mencionadas y sus cruces, hasta nuestros días. En 1956 se introdujeron en Brasil reinas de *Apis mellifera scutellata*, procedentes de Africa tropical. Las abejas procedentes de su cruce con razas europeas, "*africanizadas*", se han extendido por casi la totalidad del continente americano.

#### BEES: ORIGIN AND BREEDS

The earliest bee fossils date from approximately 40 million years ago. It is assumed that social behavior and worker morphology have evolved in tandem.

The genus *Apis* includes five species; the common honey bee *A. mellifera*.

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*ra*, the giant honey bee *A. dorsata* and *A. laboriosa*, the Indian honey bee *A. cerana* and the small honey bee *A. florea* (probably the closest living descendant of the earliest honey bees).

*Apis mellifera* is thought to have originated in the African tropics or subtropics and migrated later to western Asia and Europe. The breed extends from the southern tip of Africa through the savannah, rain forest, desert, and the mild climate of the Mediterranean, before reaching the limits of its range in northern Europe and southern Scandinavia. With such a variety of habitats, climatic conditions and flora, it is not surprising that numerous subspecies of honey bees are found, each with distinctive characteristics adapted to each region.

We know 24 taxonomic groups or breeds of *A. mellifera*. Ruttner (1988) divides it into three distinct groups: European (well studied), African and Oriental (little known).

Only two European breeds (*A. mellifera mellifera* and *A. mellifera iberica*) were introduced to America by the first colonizers. Other European breed (*A. mellifera ligustica*) began to be introduced at the end of the 19th century. In 1956 a new breed from Africa (*A. mellifera escutellata*), which was to have a great influence on the actual state of apiculture in the American continent.

*A. mellifera mellifera* (Linnaeus, 1758). Found from the Pyrenees to the Urals, from Scotland and South Scandinavia to Provence. They are large bees, with relatively short tongues (5.7 to 6.4 mm) and a cubital index below 2.0. The common names are

*European Black Bee* or *English, French or German, Brown or Dark Bee*.

This bee shows behavioural characteristics that indicate its relation to the North African bee; it is nervous, irritable, aggressive and has considerable use of propolis. In winter it is well behaved in severe climates.

*Apis mellifera iberica* (Goetze, 1964). This mediterranean honeybee is found in the Iberian peninsula. It has never been properly described.

They are generally larger in size, with relatively short wings and a cubital index drastically reduced to values below 2.0. Its behaviour is described as nervous with high swarming tendency, a high stinging propensity and an excessive use of propolis.

*Apis mellifera ligustica* (Spinola, 1806). With the smallest original area (Italy) of distribution, it has been the most popular honey bee for beekeeping throughout the world. They are small, with relatively long tongues (6.3 to 6.6 mm) and abdomens with bright yellow bands. They tend to be docile and have a high capacity for adapting to varying environments.

*Apis mellifera scutellata* (Lepeletier, 1836). This bee, from the savannahs of central and equatorial East Africa, is small with a relatively short tongue, forewing and hind leg; is highly aggressive and swarms and absconds frequently.

The movement of the breeds of honey bees all over the world for beekeeping has changed the natural range of each breed and resulted in considerable hybridization

**BEEES AND THE COLONIZA-TION OF AMERICA.**

Various insects and bees around the world produce honey, but only some european bees combine high honey production with the ability to be subject to manipulation by man.

In America some stingless bees were kept by the native population. The maya codex *Tro-Cortesianus* shows drawings of bees and parts of honey combs. Maya beekeepers worked in Yucatan and adjacent regions with the specie *Mellipona beecheii*, using horizontal logs with end enclosures of clay or stone.

With the arrival of spanish colonizers the indians of Yucatan were obliged to pay tributes which consisted mainly of clothing (mostly blankets) and food, although they also allowed payment in wax and honey.

The arrival in North America of the first beehives is well documented. In a letter dated 5 December 1621, sent from the Council of the Virginia Company in London to its Governor and Council in Virginia it states *We have by this ship and the Discovery sent you... and beehives*, probably these beehives contained the *A. mellifera mellifera*.

The bees brought to America progressed rapidly. The climate in the colonies was good and they developed quickly. The rapid expansion of the european bees was probably due to their predominance over the indigenous insects, or more likely to the absence of competitive insects.

Between the arrival of european bees to America and the end of the 18th century, few and contradictory

records about beekeeping were kept on this continent.

Honey became a common food in the english colonies at the end of the 17<sup>th</sup> century. Bees reached Massachusetts by 1640 and around 1800 reached and crossed the Appalachians.

Beehives coming from Spain (containing the so-called castilian bees) and Portugal arrived in South America at the beginning of the 19<sup>th</sup> century (the first hives probably arrived in Brazil between 1800 and 1839); they contained the breed *A. mellifera iberica*.

Although no exact data exist about the transportation of the beehives from the Iberian peninsula to America, we can make an indirect approximation by the study of the wax trade.

According to Law 3. title 9, book 6 of the *Recopilaciones*, the Spanish Crown was obliged to provide the wine, oil and wax used during mass in the churches. Because the wax obtained from the indigenous bees of Yucatan and Cuba was scarce and of poor quality, it had to be imported from Spain.

Wax was exported from Spain in two forms, worked and unworked (in containers known as *Marquetas*). Spanish exportations started gaining importance from the mid 17<sup>th</sup> century until the beginning of the 18<sup>th</sup> century (American commercial apiculture started to become important at this time).

The first beehives arrived in Brazil and were distributed to Chile and Peru from there. Bees are presumed to have arrived in Argentina from Chile, specifically Mendoza province, and in time came to be known as criol to distinguish them from the italian

bees, which were brought over later.

Mellifera and iberica breeds were probably introduced into Central America at the same time, depending on where the colonizers came from.

Apiculture began in the second half of the 18<sup>th</sup> century in Cuba. Bishop Morell of Santa Cruz probably was the first to introduce it when in 1762, coming back from exile in Florida, he brought several beehives with him of the type then known as castillian bees.

### AMERICAN BEES IN THE 19<sup>TH</sup> AND 20<sup>TH</sup> CENTURIES

The Italian bee (*A. mellifera ligustica*) was brought to America from Italy at the end of the 19<sup>th</sup> century, with the big migrations between the years 1820-1930 (50 million europeans emigrated). The ligustica breed adapted rapidly to the American continent and because these bees are very docile, was adopted by the beekeepers and took the place of other breeds.

At the time that italian bees arrived, *small apicultural revolutions* happened, principally in the USA which introduced innovations and modifications that are utilized now.

They were first introduced in the USA, Argentina and Brazil (D. Patricio Larrain Gandarrillas introduced the first 50 beehives into Brazil in 1848). *A. mellifera ligustica* was the favorite breed industrially exploited in America.

In 1956 African honey bee queens (*A. mellifera scutellata* breed) from Transvaal and Tanzania were sent to the south of Brazil (Piracicaba) for

research and study of *these prolific, productive and vigorous bees*.

In 1957 some colonies swarmed and as a result there was hybridization between the african breed and the american bees. The resulting bees, being different from the local ones, were referred to by beekeepers as *africanized*, and the term has been generally adopted.

Swarms of africanized bees establish nests in smaller closed or partially open cavities (the european breeds need bigger cavities and closed), the queens lay more eggs and the colonies grow quickly. The colonies swarm when they are smaller (5 to 7 weeks after their establishment) and produce ten times as many swarms as European bees.

When colonies of both africanized and european bees are present in the same area, africanized drones drift into european colonies, whereas european drones rarely drift into africanized colonies. For this reason in a *mixed area*, many more africanized than european drones are present. In this situation a virgin queen of either africanized or european bees is much more likely to mate with africanized than with european drones.

The africanized bees increase their area of distribution continually, advancing 300 km and more per year and showing that they adapt to the american environment as well as the african environment.

In 30 years these bees spread throughout almost all of South and Central America. At present the africanized bees have spread from Argentina to Mexico and the border of the USA.

## AMERICAN APICULTURE

The beekeepers have problems with these bees, their high swarming and absconding from hives create a consequent reduction in hive popu-

lations and of honey crops. Another problem is the difficulty of obtaining apiary sites, because the bees are more aggressive.

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