

# Drone Brood

Subjects: Nursing

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Drone brood homogenate (known as apilarnil or less apistimul) is a bee product obtained by the collection of drone (male honeybees) larvae from drone cells of honey comb, from 3 to 11 days after hatching. Apilarnil, which may be defined as the male equivalent of royal jelly, is obtained from drone brood and then freeze-dried. Etymologically, the term originates from “api” for bee, “lar” for larvae, and “nil” as a shortened form of its discoverer’s name - Romanian apitherapist Nicholae Iliesiu.

Keywords: wylęg trutowy ; apilarnil ; hormony steroidowe ; suplement diety

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## 1. Introduction

Bee products are naturally occurring pharmaceutical products with a multidirectional effect on the living organism, including humans. Their pharmacologically active fractions are used in many fields of treatment and pharmacy as pharmacopoeial raw materials, dietary supplements and cosmetics <sup>[1]</sup>. The biologically active compounds of bee products include bactericidal agents and antioxidants <sup>[2]</sup>. Drone brood is one of the bee products that are not commonly known in Europe, but is a recognized and frequently used remedy in some countries of the world, such as Romania, China, Zambia, Senegal and Ecuador <sup>[3][4]</sup>. In the field of beekeeping, it is sometimes treated as waste whereas it should be used for the sake of wealth of valuable nutrients and bioactive ingredients. However, the chemical composition of apilarnil has been rarely the object of scientific studies.

## 2. Drone brood origin

Drone brood is defined as male bees developing in wax comb cells from unfertilized eggs by a process known as parthenogenesis. The development of drones (24 days) is longer than that of queens and workers (16 and 21 days, respectively) <sup>[5]</sup>. Over the first ten days, the drones develop in an open cell and the larvae are progressively provisioned by workers. The final 14 days of development occur under capping. Workers bees close the cells with queen bees and workers with a cap, while the drone cells are closed with a convex cap. This difference in caps allows for the identification of male brood in the comb. During their time of enclosure within the cell, pre-pupa and pupa do not feed, metamorphosis occurs, and the process of spermatogenesis is completed <sup>[6]</sup>. Only a few scientific reports have been focused on the changes in nutritional value of drone brood regarding the stage of development.

## 3. Stability and preservation of drone brood

Drone brood used for technological processing should be obtained on the appropriate development day. Obtaining larvae from the combs may be easier prior to capping as the larvae can then be removed from the combs with a stream of water. For capped brood combs, freezing the comb (at -20°C) or in liquid nitrogen (at -196°C) is recommended before proceeding with manual separation. A fast and less labor-intensive method is squeezing the unfrozen or thawed brood combs above a sieve and letting the juices pass through the sieve. However, such juice needs to be frozen or used immediately because it oxidizes extremely quickly <sup>[1]</sup>. Cutting out the drone larvae from the hive is associated with a loss of biological properties in a very short time. It is important to process the acquired brood within 24 hours or to protect it against the loss of beneficial properties by freezing, preservation with honey, deposition on adsorbent or lyophilization <sup>[7]</sup>.

## 4. Nutritional value

As a foodstuff, drone brood has a high nutritional value. It contains a lot of protein, fatty acids and lipids, vitamins and minerals. The specific feature of drone brood homogenate is the occurrence of steroid (testosterone, progesterone and estradiol) <sup>[1][5][9]</sup>.

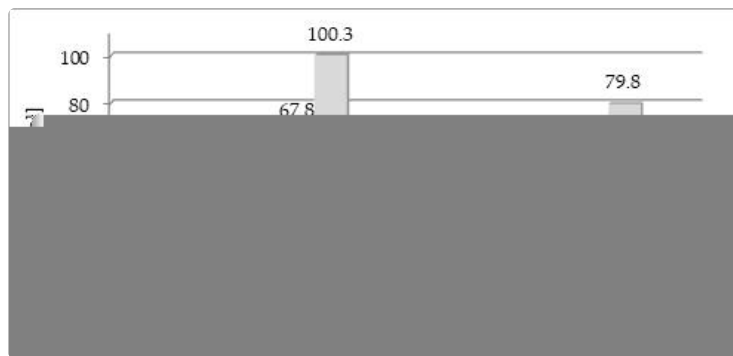


Fig. 1 Hormone levels (nmol/mL) in seven-day-old drone brood compared to royal jelly <sup>[10][11]</sup>.

## 5. Pharmaceutical activity

Rich chemical composition of the drone brood contributes to the high degree of biological activity and leads to a beneficial effect on the human body. This healing effect is widely described by scientists the use both animals and humans, indicate the positive effect of drone brood in the treatment of osteoporosis, men infertility, hypothyroidism, liver diseases, as well as protection of the fetus, cellular aging and immunity increase <sup>[12]</sup>.

## Conclusions

Since ancient times, drone brood has been used as a cheap, safe and effective natural remedy against different diseases. Unfortunately, scientists have only just begun to discover the many health benefits of consuming this little-known bee product. Only a few dietary supplements can be found in on-line sale, while majority of filed patent coming mainly from Russia. Meanwhile, due to its high degree of hormonal activity, drone brood should be thoroughly examined in order to be safe used as a component of widely accepted pharmaceuticals in the future.

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