

THE ROLE AND IMPORTANCE OF APICULTURAL BY PRODUCTS POLLEN, ROYAL JELLY, BEE VENOM, PROPOLIS

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Since the earliest times in antiquity honey was the sole produce collected by bee-keepers.

Only about 15 years ago, in France at least, at first some researchers then some practising beekeepers got interested in these produces we might villifyingly call the by-products of the bee-hive.

By these by-products we must understand pollen, royal jelly, bee-venom and propolis in order of importance.

We shall then look into them in turn indicating for the first two their importance, their role and utilization in the diet; we shall present the way venom acts in therapy while for propolis we shall describe how it is used in the apicultural lab.

Pollen

Doubtless, this is, one of the most interesting produces gathered by the bees.

Unknown in the human diet, it has been now ten (10) years since it began to occupy an important place among the natural produces which successfully supplant the chemical products which encroached upon the world pharmacopaea.

Everyone knows the origin of pollen, a flora element so badly needed by the bees to nourish their larvae. They gather from 20 to 30 kg each year, which exceeds by far the amount they require.

But the bee-keepers and especially our American colleagues, have thought first, to try and take from the bees part of the pollen balls they carry to the hive, stuck to their hinder pair of legs.

They have used for the purpose pollen traps made primarily of certain metallic or plastic bars. These bars, of a very simple design are provided with 5 mm holes generally circular in shape. They are most often located near the entrance of the bee-hive. To pass through these holes, the bees are compelled to let a part of their gathering fall into a drawer beneath. This procedure is harmless to the bee-hive, as it has been ascertained that those traps keep only 1/10 of the daily gatherings.

That enables the bee-keepers to collect nearly 2 to 3 kg of pollen from each hive yearly. Much better results have obviously been achieved, and I know on the French Gold Coast, some specialized pollen-gatherers who are successful in collecting up to 5 kg per beehive, that is several tons per year.

When pollen is prelevated from the traps, it contains about 18% water, and left as such it could not be properly stored. It is therefore essential that it should be dried, and there are two types of drying devices used for the purpose:

1. Infra-red driers. In my opinion this is the best procedure as it dries in depth.

2. Electric resistor drier. Whatever type we may use it must have a thermostat adjusted to 45°C. Above this temperature one may really face the risk of destroying the active elements in the pollen.

True, we should not forget that pollen is a fragile, living matter, to be kept free from the heating and humidity.

As it goes out of the drier, pollen is carefully cleaned to discard the impurities it may contain. It is stored in "hermetic" aluminium wrappings, and under these conditions it can be kept for many months without adulteration.

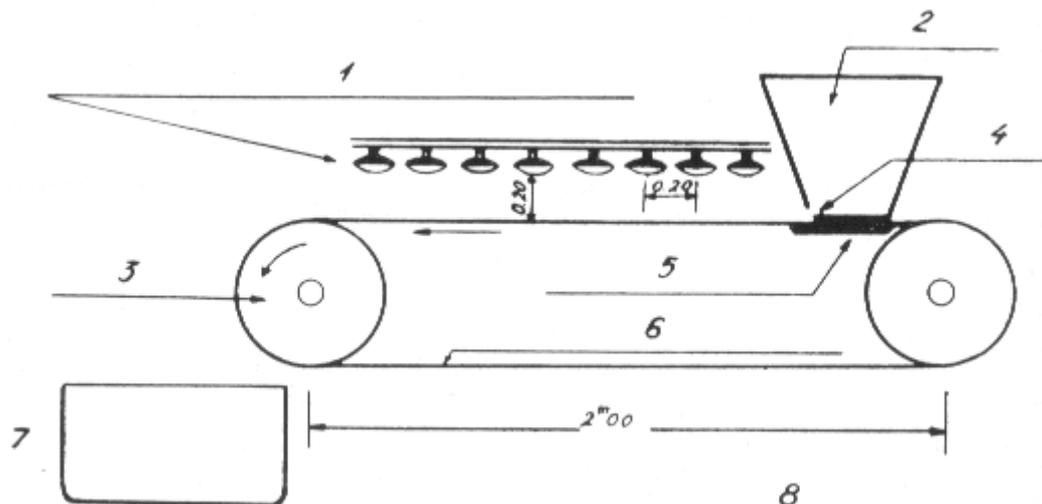
The yield is variable and depends largely on the plants visited by the bees. Some plants are very rich in pollen, the crucifers, especially rape, maize, chestnut-tree, various species of maples. Others like the orange-tree, lemon-tree, mandarine-tree as well as lavender are very poor in pollen. Usually in fine weather when the temperature is suitable the most important harvestings are made in the morning before 9 or 10, each bee-hive raising from 20 to 150gr. The gathering has to be done daily, to avoid humidity which alters pollen and make it harmful.

Pollen contains:

About 35% proteins which are no other thing than azotous albuminous substances out of which 15-20% are aminoacids, like cystine, histidine, triptophane, methionine, phenylamine, trena, arginine, isoleucine, leucine, lysine, valine, and glutimic acid. All these elements - or nearly all, are indispensable for life.

There are further about 40% sugars or glucide substances.

Finally it has vitamins: all the vitamins in the B group: thymine, riboflavine, piridoxine, nicotinamide, panthotenic acid. Next vitamin C - active carotenoids, vitamin A, etc. A total of 9 vitamins. Several hormones are further formed on the pollen, and Drs. Chauvin and Lenormand discovered too the presence of an antibiotic. (C.R. to the Academy of Science in Paris, January 2, 1957).



Pollen-gatherer

1 - 16 infra-red lamps of 250 Watt power (2 parallel rows of 8 lamps each); 2 - hopper containing the pollen to be treated; 3 - motor cylinder with speed reducer; 4 - passage (5 mm high); 5 - metal table on which the endless band slips; 6 - thick linen endless band 0,6 m in width; 7 - recovery of dehydrated pollen; 8 - advancing speed of the endless band: 0,20 m an hour.

Pollen is then, a very rich matter in noble elements and very concentrated since after being pressed in a stove, it contains only a feeble percentage of moisture.

As far as a diet is concerned pollen's main asset is its perfect rule over the digestive and intestinal functions. It removes the strongest constipations, as it does for the most persistent diarrheea. It increases the appetite, prevents weight less and meliorate to a great extent the general physical condition.

Moreover, two special and exceptional qualities emerged recently.

Following the latest research done by certain Swedish scientist, Erik Ast Upmark and Gosta Jonsson, it has been demonstrated that pollen extracts and of course pollen itself, - had given best results in prostate troubles, provided that it had been taken regularly in daily doses of 5 - 10 gr.

A very interesting fact has been recently brought to my knowledge. A lady from Lyon, was so very advanced in her diabetes that 48 gr/l of sugar were found in the urine when analysed.

Purely incidentally having read one of my books, the above reffered lady fell to eating pollen taking natural balles in the doses of 30 gr daily. After a month of treatment she had no more then 6 gr of sugar. Quite recently, that lady informed me in fine that her sugar percentage had lowered to 1 gr. This outcome is a highly exceptional one and deserves to be brought to the notice of the general public.

Royal jelly

Although as old as the world, it is known only since 1690 or thereabouts, owing to the Dutch scientist Schwammerdam who wrote in "The Bible of Nature" :

"I could see the food of the bee-queen larvae; it resembles a starch porridge. Its taste is slightly acid."

Royal jelly is indeed the single food of the young larvae of bee-queens. It is produced by a secretion of the pharingeal glands of young workers aged 6-14 days or so, as demonstrated in 1912 by a German scientist Dr. I. Lanzer.

It could be equally assessed the exceptional richness of this food, because in 5 days the young larva puts 1.800 times more weight, which is unparalleled in nature. Besides this, a bee-queen fed on the royal jelly in the larva stages lives on average 3 to 5 years, while a worker fed in the bee-hive on a usual coarser food lives when activity is in full swing, only 45 days.

At first sight, however, the richness of the royal jelly does not seem exceptional. Incorporating a great amount of water (66%) it contains 12.34 proteins - 6.46 fats - 12.49 sugars and nearly 3% still undetermined substances, that's perhaps where the secret of its beneficial action lies.

It has been carefully studied by countless American, German, Russian and French scientists, to mention only a few. They found in royal jelly a true source of vitamins, all in the B series, plus biotine, inositol, as well as C vitamin, or ascorbic acid, next A vitamin, or anti-infections, and the fertility stimulating E vitamin.

Finally there are hormones in it, and innumerable mineral oligo-elements as well as aminoacids, nearly the same as those mentioned for the pollen.

Royal jelly is antimicrobe and antibiotic, that is it has an effect upon mycobacterium tuberculosis (works by Chauvin, Hinglais, Gauterie, Langlade, Hellen, etc.).

Owing to its high content of noble elements, royal jelly should be tested in diet of human therapy.

Except for the claptraps and hullabaloo which for one moment did much harm to it in France, especially to certain physicians, we must say that royal jelly presents certain effects acknowledged in hospitals and by many private citizens.

It acts with great effectiveness upon appetite, upon anemia, by considerably increasing the amount of red-cells, upon arteriosclerosis, arterial tension, and also upon diabetes and other innumerable diseases.

But its most spectacular effects were scored with small babies and old people, against senescence and asthenia. It may be said that it regenerates and renders dynamic those who are in decline owing to their age.

Being a highly concentrated food, royal jelly has to be carefully administered.

It is generally considered that the most recommendable dose is 50 milligrams daily. It is best otherwise to take royal jelly the half size of a pea, letting it melt under the tongue because sublingual absorption is much more efficient.

Some 15 years ago in France, royal jelly was a very rare item, and its price stood at 5000 old francs per gr.

This prohibitive price, lowered regularly, as the gathering technique improved. This technique consisted mainly in the introduction of young larvae less than 36 hrs. old, in wax or plastic cells, located in a previously orphanized bee-hive. It is in fact the artificial breeding of bee-queen cut-off in the third day.

At this stage, the artificial cells are gathered, after young larvae brought out. Each cell can release from 100 to 250 mg of royal jelly.

There are in France, some bee-keepers specialized in this production. Two of them gather from 100 to 150 kg of royal jelly during an active apicultural season, for which they have marketing availability.

Bee-venom

This is occupying a prominent place in the series of by-products of the bee-hive, because its collections presented many difficulties which have now nearly overcome.

Why this crop? Because it is known of old, that beekeepers with few exceptions are left free from rheumatism. Furthermore, the venom heals them and there are very frequent cases when rheumatic persons, who have been bee-stung, have seen their rheumatism vanish as by miracle, and often, this happened entirely casual, these pricks having not been desired.

Many other ailments are curable with bee-venom, and in Dr. Saine's opinion, a surgeon from Canada, the following have to be cited : polyarthritis, altering spondylarthritis, some diseases of the peripheral nervous system, ulcers, oedema, asthenia, etc.

This is valid for those persons who can withstand the effects of stings and are not allergic to them.

It has also to be recognized that bee-venom is the most powerful and effective vaso-dilatator known. It is then highly indicated, to use it in some heart troubles and arteriosclerosis, where arteries have to be widened to ensure a better blood circulation.

Finally the venom provides an euphoria, if administered 10 stings on an average each time.

Out of this special qualities of the bee-venom, emerged a particular therapy, namely bee-stinging which is not very widely used in France yet, but it is widespread in Czechoslovakia, Russia and Canada.

There are in this countries some preparations which can be given to patients, having different names such as Virapin, Forapin, etc.

Bee-venom has been collected sometime from each bee separately, by pulling out its sting. There was in Germany at Illertissen a specialized enterprise for this job.

At present, low voltage current is used to do this job, thus keeping the bees. But the yield is always low that is about 1 gr of venom per 10.000 bees, which become otherwise very aggressive owing to the operation.

Propolis

It has two origins:

1. Inner origin. According to research done by the German scientists Kustenmacher, Phillip, Weck and al. propolis is seemingly the resinous residue which comes out of the first pollen digestion.

All new cells, and very often the wooden frames are impregnated with this substance by the bees.

2. The second origin comes from the outside. The bees collect it from the buds of some trees. More propolis is made in forest beehives than in the field ones.

Propolis composition is extremely complex, and we will not enter here into details of its composition, which is otherwise very changeable, according to its origin.

Propolis is generally disregarded by bee-keepers. Nevertheless this produce should be given greater attention.

Indeed, propolis can be primarily obtained by simple melting. This special wax is ductile, soft and can be used as mastic (putty), clay etc. for the bee-hive's needs.

Diluted in methylated spirit, it constitutes an excellent protective varnish for all the metallic objects used by the bee-keeper, beginning with the extractor and maturator.

It has been sometimes used in human medicine, that is in the Boer War owing to its antiseptic properties, on wounds, healing them by first intention, allowing for the tissue to recover. Finally I got recently a patent for its use in certain cosmetics and beauty creams.

Moreover it seems that the famous Stradivarius used once a certain amount of propolis in the varnish of his famous violins.

We have very briefly presented here the properties of those produces of the bee-hive, often considered as by-products.

Nevertheless these produces arouse great interest, they being even for amateurs, an extra-yield that deserves attention. They can contribute to the improvement of the total yield, making apiculture more attractive and profitable.

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