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CHEMISTRY FOR EVERY MORNING - COFFEE

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Abstract*. Everyone knows that coffee is our number one black enemy. The most harmful drink after vodka. And almost as much loved by the people. And how hard it is to live without coffee for those who are used to it! How difficult it is to wake up in the morning, how foggy in my head... Whether the doctor forbade it, or there is no money - no objective reasons help to come to terms with "coffee withdrawal". You have to figure out what to drink in the morning.*

Key words*: coffee withdrawal, coffee, theophylline, theine, caffeine, theobromine, beans, seeds, black potion, spice, decaffeination, coffee addict.*

ХИМИЯ НА КАЖДОЕ УТРО – КОФЕ

Аннотация: *Всем известно, что кофе — наш черный враг номер один. Самый вредный напиток после водки. И почти так же любим народом. А как тяжело жить без кофе тем, кто к нему привык! Как трудно просыпаться по утрам, как туман в голове... То ли врач запретил, то ли денег нет - никакие объективные причины не помогают смириться с "кофейной ломкой". Вы должны выяснить, что пить утром.*

Ключевые слова: *кофейная абстиненция, кофе, теофиллин, теин, кофеин, теобромин, зёрна, семена, чёрное зелье, спайс, декофеинизация, кофеман.*

INTRODUCTION

For several centuries now, mankind has been thinking about what can replace coffee if, for example, you are poor or suffer from palpitations. Coffee itself in Europe came into fashion from the end of the 16th century, and, for example, the invention of the chicory drink is attributed to the German gardener Timm, who lived in the 18th century. However, almost immediately it became clear that coffee beans (which are actually not beans, but seeds) have no analogues in nature. No matter how sophisticated you are, real coffee will not come out of any other raw material.

MATERIALS AND METHODS

Natural coffee contains four components with a stimulating and tonic effect. Most of all, of course, caffeine - from 1 to 2.3%, depending on the variety. In terms of chemical structure, theophylline and theine, more characteristic of tea leaves, and theobromine, also found in cocoa,

are very similar to it. All these substances have a common property - they activate metabolic processes, but caffeine stimulates the central nervous system more strongly, and theophylline and theobromine - the work of the heart. The effect after "ingestion" lasts about 3 hours. Another coffee alkaloid, trigonelline, does not have a stimulating effect, but when heated, it gives nicotinic acid (vitamin PP). It is impossible to list all the substances that create the unique taste and aroma of real coffee. A huge variety of organic acids and products of their thermal decomposition; tannins, carbohydrates and amino acids... In a word, it is not surprising that coffee (as, indeed, all living things) turned out to be unique in its composition: this wonderful combination is not reproduced anywhere else.

However, centuries of empirical research have not been in vain. In different countries and at different times, a variety of plant products were used to make “coffee”: chicory and dandelion roots, beets and carrots, Jerusalem artichoke tubers, soybeans, barley, oats, rye, wheat, malt, legume seeds, nuts, acorns, chestnuts , wine berries and burnt treacle sugar, grape, apricot and even date stones. All this was dried, ground, roasted... What turned out was not an equivalent substitute for coffee, but it was quite suitable for falsifying it - for example, for mixing it into ground coffee and then selling it at a real coffee price. At the beginning of the century, even such a masterpiece appeared as artificial coffee beans, molded from cereal dough in a special machine!

RESULTS

In fact, the drinks themselves turned out to be quite good: inexpensive, moderately bitter, appetizingly smelling of fried food, suitable for drinking hot (and this is important for European winters), and without any stimulating effect, harmful to health and suspicious in terms of religious morality. (It should be noted that both Christians and Muslims doubted for a long time whether true believers should use black potion. In the end, coffee won two major victories: in the Ottoman Empire, Suleiman II ordered that no more tonic drink lovers be thrown into the sea, and in Europe, the pope himself Clement VIII ate coffee and allowed all good Catholics to drink it, but to this day there are many stubborn people in the world who prefer chicory and oats to real coffee precisely for religious reasons.)

A good solution to the problem of a coffee substitute would be coffee, the beans of which contain the same fragrant and flavoring substances, but there is nothing so ... exciting. In nature, such a miracle is not found. But you can artificially remove caffeine from grains! The decaffeination process was invented in 1900: green, unroasted beans are treated with superheated steam and organic solvents. After that, only 0.08% of caffeine remains in the grains. Such coffee is more expensive than usual and less aromatic.

This method has been used in production for a long time. Similar drinks ("Night&Day", "Santino") can now be purchased from us. "Santino" is a coffee drink, which, in addition to substitutes, also includes an extract of real coffee "with a reduced content of caffeine". Although not exactly coffee, but still not oats. A "Night&Day" is pure decaffeinated coffee.

DISCUSSION

By the way, about half of coffee lovers are actually pretenders. They do not die of fatigue with a lack of caffeine in the blood at all and may well wake up after drinking a tart, fragrant and hot coffee drink, and not coffee. Another thing is that none of them will put such a harsh experiment on themselves until they “lock in”.

And when he “suppresses” - when the doctor, after listening to his heart, says: “Do you drink coffee? Don’t drink anymore,” the coffee lover realizes that he is in trouble. Because ordinary instant coffee today is as easy to get as a pack of cigarettes, but you may have to look for a coffee drink. The same "Santino" is not popular with hawkers. Dangerous product: there are coffee beans on the label, the buyer takes it for natural coffee, and then comes to swear...

Its taste will remain the same. Here we will not catch up and overtake Europe and America. Although, as everyone knows, instant coffee cannot be compared with natural coffee, its taste characteristics reflect the traditions of coffee preparation in each particular country. So, in many Latin American countries, coffee is brewed from beans that would seem burnt to us. And Latin Americans, on the contrary, wonder why Europeans never finish roasting their coffee. (By the way, for internal use in the embassies of these countries, coffee beans are roasted black, including on the machines of the Mospishchekombinat

Coffee roasted stronger than is customary in Russia becomes more bitter and loses the sour taste that connoisseurs like so much: oxidation products formed in the early stages of roasting are destroyed during longer processing. That is why Latin American instant coffee, according to some Muscovites, is bitter and does not have a delicate taste. It is good to drink such coffee with milk or cream: interacting with tannins, they reduce bitterness.

What about decaffeinated drinks? They are not overlooked either. True, here everything is somewhat different. We already know about granulated coffee, which is produced in the West by coffee powder obtained by dehydrating the extract, churning it into granules with small streams of steam. Such coffee dissolves more easily in cold water and has a higher density than powdered coffee (compare the volumes of a 100-gram jar of our coffee and a jar of granulated imported coffee). And besides, in the minds of the buyer, this form is associated with new technologies and higher quality.

But coffee substitutes are not yet able to granulate either in the West or in our country. The fact is that both rye, and barley, and chicory rhizome contain many oligosaccharides, which make the powder more hygroscopic than the powder from natural coffee extract. (That is why instant chicory was produced for a long time in the form of a thick paste.) In the end, the powder turned out, but the streams of steam would turn it not into separate granules, but into a lumpy mass. So technologists of all countries willy-nilly have to put up with the unfashionable form of production of "health drinks" for the time being.

For example, in America, coffee drink manufacturers offered semi-instant coffee granules to their customers. Porous walnut shell granules carry the remaining components. Dissolution occurs quickly, but the granules themselves naturally remain at the bottom of the cup.

CONCLUSIONS

Practically all over the world (and at Mospischekombinat too) instant drinks are produced on the equipment of the Danish company Niro-Atomizer. But making a drink from several types of raw materials is a particularly delicate matter: after all, each type requires its own processing mode, a certain temperature and frying time. Extraction is also carried out separately, and only before drying, the extracts are mixed.

Since the beginning of the 80s, cereal and chicory extracts have been treated with enzymes that break down large molecules. At the same time, of course, the viscosity decreased

and spraying was greatly facilitated. For the same purpose, tannin extract obtained from chokeberry, grape seeds and other tart plants is added to the raw material. Tannins not only reduce viscosity, but also increase the permeability of plant cell walls, which means that the yield of soluble substances during extraction improves. And the tannins themselves in the finished drink are quite in place: they ennoble the taste and increase the health benefits.

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