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A New Natural Treatment Method for Humans "Treatment with Soil"

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Abstract:
The most well-known natural complementary and alternative treatment methods include herbal treatment, acupuncture, massage, chiropractic care, apitherapy, homeopathy, massage therapy, naturopathy.
The "Treatment with Soil" method was first proposed by Saracoglu I. A. Widely recommended by physicians, it is recommended "to walk in the fresh air, to walk in the forest, to go to the region where you were born and raised, to breathe the air, to drink from the spring waters." In the light of these and similar recommendations, "Treatment with Soil" was put forward as a brand new natural treatment method as a result of the research of the underlying causes by Saracoglu I.A.
How to prepare, inoculate and irrigate the soil in our daily living environments (for example, the soil of any plant we grow in the office or home environment) is explained respectively. The aim is to utilise the complementary, supportive and preventive therapeutic power of the "volatile organic compounds VOC" secreted by streptomyce soil bacteria by introducing them into our living environments whose air we breathe.
Below you will read the story of the development of the "Treatment with Soil" method proposed by Saracoglu I. A.

Introduction

Thousands of species of bacteria living in the soil secrete thousands of completely different volatile and non-volatile organic compounds into the air we breathe and into the soil, one of their habitats. We call these compounds secreted by bacteria Secondary Metabolites (SM). Each bacterium in the soil releases dozens of different secondary metabolites from its habitat (rhizosphere) into its environment. Some of these secondary metabolites (SMs) are volatile and are released into the atmosphere where they are distributed to all living organisms living above the soil, including humans, animals and plants.

These SMs enter the atmosphere (air) and remain stable in the air for several minutes to several hours. Some SMs remain intact in their molecular structure for several days. The stability of SMs in their molecular structure is directly dependent on weather conditions and the photochemical environment in which they are present. Photon (light) interaction is the weakest point of SMs. Especially the UV (ultraviolet) field is the most affected area. The longest and most stable period for SMs is rainy weather.

In general, the concentration of volatile SM in the atmosphere ranges from 1 ng/$m^3$to 1 mg/m^3 . SMs secreted by subsoil bacteria have molecular weights <300 kD and high vapor pressures, they easily diffuse through the subsoil and become airborne.

Except for methane, carbon monoxide and carbon monoxide, the three main sources of organic carbon (biogenic VOCs Volatile Organic Carbon) secretion into the atmosphere are;

- Vegitation
- Soil
- Oceans

Bacteria living in soil secrete thousands of functional and bioactive volatile secondary metabolites (SM). It is already known from the literature that these bioactive metabolites have very different active properties on all living organisms (human, animal, plant and microorganisms).

For example; anti-viral, anti-bacterial, anti-fungal, anti-proleferative, anti-tumoral, anti-inflammatory, anti-rheumatic, anti-cancer, anti-plasmodial, anti-helminthic

Table: 1 gives examples of some subsoil bacteria that secrete SM (Secondary Metabolites) and Table: 2 gives examples of some secondary metabolites secreted by subsoil bacteria.

Table 1: Some Subsoil Bacteria Secreting Volatile SM

Actinobacteria	Pseudomonas
Acidimicrobiia	Rhizobium
Frankiales	Mycobacterium
Kineosporiales	Flavobacterium
Burkholderia	Mesorhizobium
Streptomyce Streptomyces	Enterobacter
Streptosporangiales	Bacillus
Erwinia	S. venezuelae
S. fradiae	S.avermitilis
S. ghanaensis	Spirillum peregrinum
R. aggregatum	R. leguminosarum
R. borbori	R. vitis
Spirillum delicatum	S. minitulum
Cyanobacterium fischerella	Azotobacter
Bacillus megaterium	Pantoea agglomerans

Table 2: Some Volatile SMs Secreted by Subsoil Bacteria

Volatile secondary metabolites	**µg/m^3**
2-Methyl-1-propanol	3.03
3-Methyl-1-butanol	3,61
3-Methyl-2-butanol	3.61
Geosmin	7.46
Limonen	4.57
α-Pinen	4.83
β-Pinen	4.35
Dimethyl trisulfid	1.87
2-octen-1-ol	1.75
Isoprene, stable residence time of 3 hours	2.11
Monoterpene, 3 hours	
Sesquiterpen, less than 4 minutes	
Auxin (hormone)	
Indole acetic acid (hormone)	

Treatment with Soil

Phytotherapy, Aromatherapy, Apitherapy (treatment with bees and bee products) are just a few of the natural treatment methods that are commonly practiced today.

Treatment with Soil is very different from the treatment of soil and is a subject that has been researched and studied by Saracoglu I. A. for a long time.

Treatment with Soil is based on human health. It is a way of treating people with soil as an alternative to treating people with plants, just as in herbal treatment. Soil has therapeutic, protective and preventive power on human health. This power has always existed but has been misinterpreted. Because scientists were looking at it from different angles. No one has ever thought that "soil" could be the main source of it. Saracoglu I. A. aims to raise awareness with his research on this subject.

To give an example on the subject, as an ethnobotanical treatment among the people, it is said; "so-and-so was sick, he went to his village to take the country air." It has always been thought that the air and water of his village would cure him... Breathing the air of the country is a common "ethnobotanical" culture of Anatolian people. The idea that walking in forested areas, breathing mountain air, walking in the open air is good for illness is also part of the culture of Europeans. Among the suggestions of the Germans and the British in this sense, "Breathe fresh mountain air for the treatment of your illness", this suggestion made by a British doctor to his patient has passed into the literature.

The absorption of SMs in the air by breathing or through our skin has a great effect on human health. Each of the secondary metabolites (SM) has bioactive properties. Such as antiviral, antibacterial, antifungal. We continuously take and store dozens of metabolites that are effective against especially upper respiratory tract infections, fungi and cancer into our body through respiration. In addition to all these, we should not forget the cleaning power of "purifying the body".

In a forest or mountainous area, the density of viral and bacterial load in the air is almost zero, while the load of SMs is maximum. In other words, their purifying, preventive, protective and therapeutic power is the highest. With each breath, the accumulation (density) of SMs in the body gradually increases. In rainy weather, this increase reaches its highest level. The reason for this can be easily calculated and given with an education in Physics-Chemistry-Biology. It corresponds to a force of approximately 540 Newtons. Considering the average size of a raindrop and a single bacterium, the raindrop acts as a hammer blow on the bacterium.

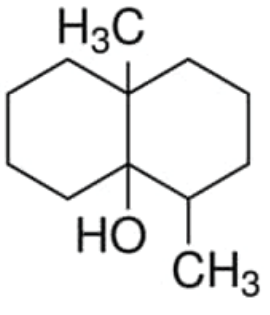
If the weather in the country is no longer as effective as it used to be, it should be known that environmental conditions have changed. The first thing to ask is, has there been a change in the rivers? For example, if a dam has been built, it means that the ground water level of the soil has decreased. Since the soil surface has dried up, it means that the bacteria that secrete SM have disappeared. Since the stream has dried up, it means that SM will not be secreted because the soil bacteria in its lithoral structure no longer live. As a result, the purifying, preventive, protective and therapeutic power that should be in the air of the country has disappeared.

The truth is hidden directly in the soil, in its microbiology, biochemistry and mineral balance. The main idea is soil. The concept of "Soil Cure" started a few years ago when Saracoglu I. A. read an article about how the camel was oriented towards water in the Sahara Desert. How did the camel find

water in the desert? Just like in the Kuran, where the Hoopoe shows the caravans where to find water. Science shows us the way, gives us examples.

The Attractive Power of Soil: Its Smell

The smell of earth in the air after the rain is called " petrichor". In ancient Greek, "petros" means stone, while "ikor" means the liquid that flows from the veins of the gods. It is secreted by bacteria living in the soil and in the language of chemistry this component is called "geosmin". In ancient Greek, "geo" means soil and "osme" means odor.



geosmin

It is a non-toxic compound for humans. It has a very strong odor. Even when you dilute it a billion times, you can detect its strong and deep odor. Some of the animals, such as camels, can detect the smell of geosmin tens of kilometers away through the olfactory receptors in their nose. It can easily detect a small oasis with water 100-150 kilometers away in the desert. It detects "geosmin" secreted by "Streptomyce" bacteria from the wet and moist soil in the area where the water is located through its nasal receptors.

Where there is water, there are species of bacteria in the soil. One of these bacteria is Streptomyce spp. These bacteria secrete a secondary metabolite (SM) called "geosmin". Geosmin is volatile. Carried by air and wind, geosmin molecules reach the odor receptors in the camel's nose. The camel moves towards the ground in the direction of the geosmin odor (towards the water source). The density of geosmin in the air is around 2 picograms/m3 and the odor receptor in the camel's nasal structure detects geosmin at such a low level. The human nose cannot detect geosmin at such a low density.

The hairs on plant leaves contain plant-specific odor compounds. When rain droplets hit the hairs on the plant leaf, they break them down and the odor components are released into the air. The common chemical group name for these compounds is "terpenes". The terpene family includes a large number of different molecules, which have in common that they have different odors. Geosmin is a molecule in the "terpene" group (component.) It contains "geosmin", which gives beetroot, a subsoil crop, its distinctive earthy odor.

The impact of a raindrop is enormous. The water droplet hitting the micron-sized hairs on the leaf acts like a hammer blow, shattering the hairs and causing their contents to flow out. In rainy weather, the effect of the water droplets is so powerful that the hairs on the plant leaf break down and render harmless the mold particles, while the bacteria in the soil release their metabolites in abundance.

Thousands of antibacterial, antiviral, antifungal, chemotherapeutic molecules enter the air and cause us to breathe.

Who knows what complaints we are preventing in our bodies, or eliminating a disease that has already formed but has not yet invaded (not yet established, not yet taken root), or destroying pathogens that have not yet taken action. The Table below shows how many types of compounds (secondary metabolites) are secreted by strepomyce bacteria. These are the ones that have been discovered and identified. There are many more metabolites that have not yet been discovered and that we do not know about. The genetic makeup of Streptomyce bacteria has a gene that produces "geosmin".

Geosmin is also found in the fungal mold that forms on rotten vegetables and fruits.

Importance of Bacteria in Treatment with Soil

Streptomyce bacteria live in soil and secrete many different SMs into their environment, one of which is lectin (agglutinin). Lectin is a protein that is very fond of binding to different types of sugars (such as glucose, mannose, fructose, xylose, galactose). Briefly, lectin sticks to almost any component that contains sugar in its molecular structure.

Various lectins produced by the soil bacteria Streptomyce are also effective against viruses. Viruses have outer sheaths (membranes, "needle-like"). For example, the spiky structures on the outer surface of the Covid 19 virus are called "spikes". Different sugar molecules are also attached to these spikes. Here, lectin binds to this sugar structure of the virus and blocks it, restricting its mobility (immobilized). The covid 19 virus, whose movement is blocked, is thus prevented from being able to infect.

Lectins are also called "agglutinins" because they have the ability to adhere (fusibility, connectivity , agglomeration) to bacteria, viruses and living cells. This feature of the lectin is directly linked to the sugary structure on the cell surface. For example, according to the type and source of lectins, the fact that they can bind according to the type and structural state of the sugar on the surface structure of erythrosides, which are blood cells, plays an important role in determining the blood group in humans (AB0, MN and A1 subgroups, etc.).

Lectins are selective and sensitive to various types of sugars, they have opened new horizons in cancer treatment, in the identification of cell surfaces, in the elucidation of the structural status of glycoproteins, and as immunomodulators against bacteria and viruses.

The short-chain volatile lectins secreted by Streptomyce bacteria enter the atmosphere in abundance in rainy weather and bind pathogenic viruses in the air, blocking them and rendering them dysfunctional.

Lectins are also found in plants. Many grains and legumes of plant origin (bread wheat, chickpeas, lentils, lentils, soybeans...) and eggplant as a vegetable are highly effective in viral infections. Cereals and legumes as a preventive and protective measure against coronavirus and the consumption of eggplant was highly recommended by Saracoglu I.A.

Soil, Seed and Bacteria Relationship

As each seed takes root, it also secretes hundreds of metabolites and prepares its own microbiota. This microbiota content is both food for the plant's own immune system and for the rhizobium (bacteria that live around the root of the plant). Table 3 shows some of the components that the seed secretes into the soil through its roots. Seed secretes into the soil metabolites are called "exudate".

Table 3: Some of the Metabolites Secreted by the Seed

Sugars	Fructose, galactose, rhamnose, sucrose, glucose
Amino acids	All 20 amino acids, homoserine
Aliphatic acids	Formic-, acetic-, butyric-, citric-, oxalic-acid
Aromatic	hydroxybenzoic-, caffeic-, avenic acid
Phenolics	Flavonols, flavones, isoflavonoids
Sterols	Campesterol, cholesterol, sitosterol,
Fatty acids	Linoleic, linolenic, oleic, palmitic,
Enzymes	Amylase, invertase, phytase, protease, apyrase,

Interaction of Soil, Plants and Bacteria

When the plant is diseased or stressed by environmental conditions, it sends SMs through its roots to the soil and rhizobium (bacteria living around and on the roots). A significant proportion of these SMs are nutrients for the rhizobium, while others are short-chain signaling molecules. That is, they carry information about what disease the above-ground parts are suffering from. Bacteria that receive the signaling molecules, after receiving the message about the disease or stress in the above-ground parts of the plant, release the therapeutic metabolites that they synthesize (prepare) against the above-ground complaints of the plant into the root rhizosphere of the plant. The plant treats itself by absorbing the SMs synthesized by the bacteria through the roots.

Discovery of the First Antibiotic from Soil

The first antibiotic was obtained from soil. In 1928, Alexander Fleming obtained penicillin (antibiotic) from a soil-dwelling fungus (Penicillium notatum), saving millions of lives. Although Fleming tried hard because he was not a chemist, he could not explain the molecular structure of penicillin and could not separate it from the fungus. Ernst Boris Chain, a chemist, replicated Fleming's work and isolated penicillin (separated it from the fungus) and explained its molecular structure and mechanism of action.

Born in 1906 in Berlin to a Jewish family, Chain graduated from Friedrich Wilhelm University, Department of Chemistry in 1930. After Hitler came to power in Germany, he immigrated to England in 1933. He was accepted to Cambridge University for his doctoral studies. After his PhD, he moved to Oxford University, where he began research on natural secondary metabolites (SMs), that is, natural antibacterial molecules (secondary metabolites) secreted by various Streptomyce spp. and Actinomyce

spp. bacteria living in soil. Here he crosses paths with Fleming and identifies the penicillin molecule with antibacterial properties. In 1945, together with Fleming, he was awarded the Nobel Prize in Medicine. They win the prize.

In 1941, a team of scientists from the UK (Howard Florey and Norman Heatley) traveled to the United States to the Northern Regional Research Laboratory (NRRL) agricultural research center in Peoria, Illinois in 1941 to produce penicillin, which was essential for the war effort. The aim was to multiply penicillin as soon as possible and deliver it to wounded soldiers.

Streptomyce from Soil

In 1945, Selman Waksman discovered the active ingredient streptromycin (secondary metabolite) secreted by Streptomyce bacteria living in the soil, proved that it was effective against tuberculosis (TB) and saved the lives of millions of TB patients. This discovery also led to the closure of tuberculosis fighting associations, which were widespread in almost every province all over the world. The discovery of streptomycin earned him the Nobel Prize in Medicine in 1952.

"Rapamycin" Against Cancer from Soil

Rapamycin (secondary metabolite), derived from a Streptomyce spp. bacterial species from the soil of Rapa Nui Island (Easter Island) in the Pacific Ocean, is an antibiotic used in skin diseases and upper respiratory tract infections. Rapamycin is currently used as a drug in many types of cancer because it acts as an inhibitor against the Pi3K (Phosphatidylinositol 3-kinases) protein found in cancer cells. Pi3K is a protein responsible for invasion, proliferation and growth.

In 1972, the secondary metabolite "rapamycin" produced by Streptomyce bacteria in soil samples taken from the island of Rapa Nui was a revolutionary discovery. Rapamycin inhibits the activation of B and T cells, which are among the most important cells of the immune system, and inhibits the sensitivity of interleukin-2 (IL-2) to these cells. Since IL-2 is a cytokine, it prevents the formation of a cytokine storm. Because of this feature, it has been used as an immunosuppressive drug in organ transplant patients. It has also been successfully used to coat stents in cardiovascular surgery. Rapamycin is also used against lymphangioleiomyomatosis (cystic lung damage) that can develop in women in labor.

Because rapamycin is so widely used in medicine, samples have been collected from soils around the world and hundreds of different species of Streptomyce bacteria have been studied. Samples were taken from all over the world, from the soil of Mount Ararat to the waterfalls of Ghana, an African country. By 2002, more than 20,000 natural bioactive secondary metabolites had been discovered from numerous Streptomyce species. Many of these have been patented and many have been published as academic papers.

A Secondary Metabolite from African Soil

SM (avermectin) secreted by avermitilis, a species of Streptomyce bacteria living in the soil around Kintampo Falls in Ghana, an African country, is used against malaria and is sold for about 1 billion dollars a year. Avenolide obtained from Streptomyce ganaensis has an inhibitory effect on the proliferation of cancer cells and is also a powerful antibiotic. Since these metabolites are volatile, they are also present in the air. They also enter our body through respiration.

Another Antibiotic from Anatolia

Recognized as the most powerful antibiotic of the last fifty years, daptomycin is a secondary metabolite derived from a spp. strain of Streptomyce bacteria living in soil. This bacterium was obtained from Anatolian soil (Mount Ararat).

Negative Impacts of Climate Change

Soil erosion caused by excessive rainfall irreversibly destroys bacterial species and varieties. Soil microbiology (microorganisms living in the soil) and chemistry are highly affected by climate change. Their genetic resources are also disappearing. Droughts due to climate change and the lowering of the water level of the soil to lower layers, the replacement of aerobic bacteria by anaeorobic bacteria, the spread of more toxic secondary metabolites into the air (atmosphere), and the inability to breathe secondary metabolites, which are of primary importance for human health.

If people who prefer metropolitan life cannot smell the smell of the soil, it means that they cannot absorb secondary metabolites, which have preventive, protective and therapeutic powers, through the skin, by inhalation or through the mouth, which means that the human immune system is weakened.

If you grow flowers at home, you can inoculate the soil and provide the air of your living environment with natural biogenic, functional, volatile secondary metabolites.