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Agriculture Based on Biochemistry and Information Systems in Era 5.0

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Introduction

Era 5.0 will make things easy by integrating virtual space and physical space. Japan has initiated this by applying digital technology centered on human life.[1]. Society 5.0 is a super-intelligent society where big data, the Internet of Things (IoT), artificial intelligence (A.I.), and robots blend into every industry and social segment. So also with the field of Chemistry collaborated with Agroindustry and I.T. It would be better to produce with collaboration because each will be an expert in his field and will be perfect when collaborating. Chemists will maximize chemistry research, which can also collaborate with pharmacists and will be collected in the form of Big data by alhi I.T., this information is used to make intelligent machines that humans want. It can be controlled from afar by using the internet as per human wishes.

All obstacles are used as challenges, such as the Covid-19 pandemic originating from Wuhan.[2]–[5], Humans need good drugs, chemically synthetic drugs.[6], [7] Or herbal or traditional [4], [8], to fight it. Herbal medicines needed are natural ingredients that have antimicrobial capabilities.[9], [10] both antibacterial and antifungal and especially antiviral. In addition, raw materials with immunomodulator capabilities strengthen our body's endurance. Among the natural ingredients that have antibacterial, natural antibiotics, antifungal and antiviral abilities, and immunomodulators' ability are VCO. The search for a suitable vaccine is also always done, although until now there is no vaccine that matches covid-19.[11], Because it's always mutated. This obstacle will finally be able to be facilitated and in accordance with what humans want, namely by consuming VCO and other herbal remedies. It therefore needs an intelligence to create a VCO, using remotely controlled human-controlled working robots using the help of the internet.

The challenge for the future is not only about covid-19, But the agricultural problem that will arise is about the climate. A climate anomaly has started from now, thus affecting the growing season for agriculture that depends on the season. For the time of 5.0, agriculture no longer depended on the seasons, but humans governed the farm. How?. Agriculture is no longer in the ground but can be in tall buildings or greenhouses where CH₄ or N₂O emissions are regulated. Its climate or things required by cultivation such as temperature, humidity, irrigation or water availability[12], pH, nutrients, and such are controlled by humans from afar using the internet (IoT) and buttons from Hape only.

Agriculture cultivates staples, or primary metabolites, and has cultivated secondary metabolites. Where secondary metabolite substances to be produced by plants are regulated by

humans over the internet with a remote handphone. That nursery is no longer conventional but has been practiced with tissue culture.[13].

Discussion

One example of human needs for the present, until the time of 5.0, is the herbal supplement Virgin Coconut oil (VCO). Because this virus is always mutated, we will always be haunted by this virus. So we have to defend ourselves. VCO is pure coconut oil made by fermenting coconut milk without heating or adding inoculum or other bacteria.[10], [14]–[18]. But it requires certain chemical or physical conditions such as humidity, temperature, enzyme concentration, or substrate concentration for fermentation to be successful. Virgin Coconut Oil is very much a health benefit, especially to help cure covid-19 and maintain the body's immunity so that the covid-19 virus cannot attack it.[19], [20]. The use of VCO to maintain immunity and help the treatment of covid should be more popularized and socialized because this VCO is based on plants or herbal plants that not all countries have this natural produce. Indonesia is the world's No. 1 coconut producer, Malaysia, Thailand, India, and Bangladesh. In comparison, the U.S. has very few, namely in the Islands of Hawaii.

Virgin Coconut Oil, which is used to meet human needs



Figure 1. Virgin Coconut Oil

To make Virgin Coconut Oil, this can be through robots or intelligent machines. To make it needs some information collected in Big data, and will be translated into I.T. language. The tool is by mechanical engineers in collaboration with I.T. experts. The conditions manufactured are set from afar and controlled by humans according to the wishes of that human being. The required information is as follows,

1. Raw materials
 - Coconut age one year
 - Cook
 - There is no puff/cork in coconuts
2. Coconut milk
 - Comparison of grated coconut with water 1:2Viskositas
 - Temperature
 - Light
 - Moisture
 - pH

1. VCO

- Lauric fatty acids
- Palmitic Fatty Acids
- Myristate fatty acids
- Stearic Fatty Acids
- Other fatty acids
- Antimicrobial ability
- Antibiotic ability
- Antivirus capabilities
- Immunomodulator capabilities
- Components of phenol compounds
- Sterol compounds
- Steroids
- Alkaloids
- Tocopherol

It can be explained at No. 1. It is the selection of raw materials done by humans because it cannot be helped. Humans must do it. Then the coconut fruit is peeled using a machine, divided using a device, then taken coconut meat using a machine, and mashed still using a machine. Following VCO produce is no. 2. Using a machine, the manufacture of coconut milk with a water arrangement compared to fine coconut is 2:1 can be by using a machine. Then the fermentation process also uses a machine equipped with viscosity, temperature, light, humidity, and pH measuring instruments. Finally, no. 3, VCO produced from fermentation can be harvested with the machine modified using the principle of separation. It can be done using a machine that serves as a centrifuge separating the liquid from the twisted solids. And immediately in the analysis of the VCO content of the harvest by installing G.C. chromatography tools. All of them are digital and used for human purposes. Humans can control this process from an infinite distance by using the internet network. Control by humans is when humidity is less qualified, then the alarm will sound, and humans can remotely process the increase in humidity so that the process runs.

Antimicrobial analysis of Virgin Coconut Oil.

The thing that supports VCO can help human difficulties in era 5.0 is because there has been some research on its antimicrobial capabilities.[20], [21], Using test bacteria *Lactobacillus plantarum*, *Lactobacillus thermobacterium*, *Corineabacterium bovis*, *Corineabacterium xerosis*, and *Microoccus luteus*[21]–[23]. Continued by using pathogenic bacteria isolated from the push of patients with otitis media supurative khronis (OMSK).[24], yaitu *Staphilococcus aureus*, *Pseudomonas sp*, *Escherichia coli*, and *Klebsiella sp*. In addition to antibacterial has also been done antifungal with mushroom tests are *Candida*, dan *Rizhopus*.

Bioactive components of coconut plants present in VCO.

Coconut plants contain secondary metabolites as bioactive components that can inhibit the growth of covid -19 [16], [25] like,

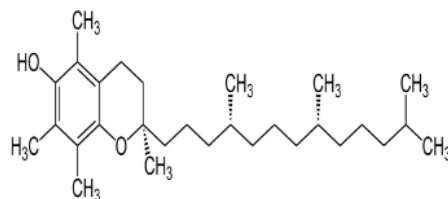


Figure 2 Structure of Tocoferol

In figure 2 is a bioactive Tocoferol that serves as an antioxidant substance ¹ that can inhibit the growth of the covid-19 virus

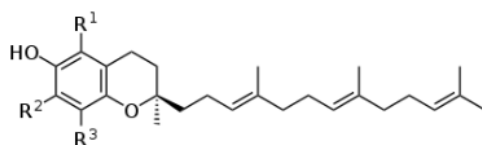


Figure 3. Structure of Tocotrienol

Figure 3 is the bioactive structure of VCO which is a tocotrienol derivative of phenol compounds that can inhibit the development of covid-19.

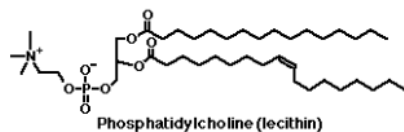
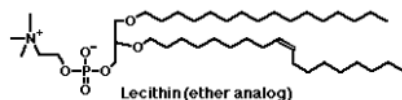


Figure 4. Phospholipid Structure

Virgin Coconut Oil conceives various types of fatty acids as a bioactive that ⁶ can inhibit the life of the covid-19 virus, either as an antimicrobial, antiviral, anti-cancer, or as an immunomodulator. Three types of VCO are distinguished from water to extract coconut milk is analyzed its fatty acid content which results are as follows. In VCO (A), which water to remove grated coconut water is used, the fatty acid Laurat 54.06% (at most), palmitic fatty acids not found, stearic fatty acids 12.03%. For VCO(B), lauric fatty acids were 53.90%, palmitic fatty acids were not found, and stearate fatty acids were 12.01%. And for VCO(C), its lauric fatty acids were 53.70%, its palmitic fatty acids were also not found, and its stearic fatty acids were 11.9%.

Cultivation of agricultural, medicinal plants / secondary metabolites.

The problem of tackling the covid-19 virus in era 5.0 can be solved using drugs from natural materials that produce secondary metabolites. So that the farm moves on the cultivation of medicinal plants. The use of medicinal plants is very significant, because based on the utilization of bioactive compounds [26], such as the description of the following plant phytochemicals,

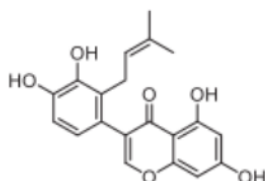


Figure 5. 5,7,30,40-Tetrahydroxy- 2'-(3,3-dimethylallyl) isoflavon

Figure 5. Showing the structure of phytochemicals that become secondary metabolites is 5,7,30,40-Tetrahydroxy- 2'-(3,3- dimethylallyl) isoflavones derived from the psororhannus arborescent plant. This plant can inhibit the growth of the covid-19 virus. In Indonesia this the plant is called the renek tree.



Figure 6. Renek Tree Plants that can inhibit the growth of the covid-19 virus

Red spinach vegetables have an excellent bioactive component to inhibit the growth of the covid-19 virus

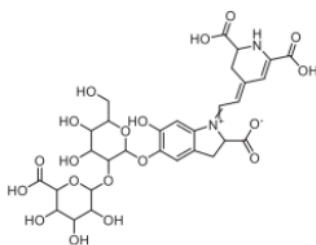


Figure 7. Amaranthine

Figure 7. It can be explained that the phytochemical structure of the red spinach vegetable plant is Amaranthin. This red spinach vegetable can inhibit the growth of the covid-19 virus.



Figure 8. Red spinach vegetables

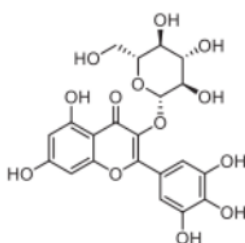


Figure 9. Myricetin 3-O-Camellia beta-D-Sinensis glucopyranoside

Figure 9 explains the phytochemicals structure of the bioactive Myricetin 3-O-Camellia beta-D-Sinensis glucopyranoside. This bioactive substance is found in the tea plant Camellia Sinensis. So that for the time to come, the indeed need to be popular when cultivating and its use. Because it contains bioactive substances that can inhibit the growth of covid-19

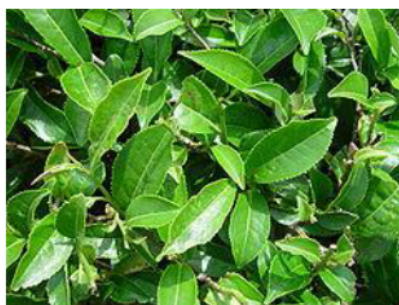


Figure 10. The plant that contains phytochemistry antiviral covid-19

Artificial drugs used to kill the covid-19 virus are usually those that have the following active components,

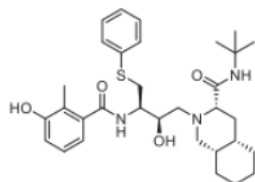


Figure 11. Nelfinavir

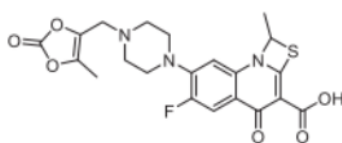


Figure 12. Prulifloxacin

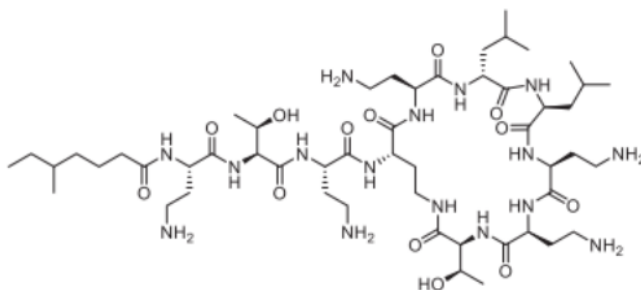


Figure 13. Colistin

It is best to use herbal medicines. We are no longer using synthetic drugs.

Pembibitan dengan metode Rekayasa Genetika

There are also nurseries using genetic engineering methods, among others, by using tissue culture or engineering seedlings according to human wishes. Such as engineering rice seedlings that respond to drought[13]. For the time of 5.0, this will be even more popular, such as cultivating rice seeds that produce more fruit with tissue culture.[27]. Breeding plants such as in Japan [28], namely rice breeding based on its genomics in the future in Indonesia, will also occur. Rice seeds resistant to Methane and N₂O emissions [12] are also made through genetic

engineering.⁴ Rice growth can be monitored with synthetic aperture radar (SAR) time series.[29], It is connected to the Internet (IoT). Likewise, the problem before harvest is studied using molecular mechanisms.[30] so that the resulting seedlings do not experience loss before harvest. To get rice seeds whose rice color is putting clean and no longer requires bleach, the manufacture of seedlings is also done by genetic engineering by marking the properties of the white carrier.[31].

Conclusion

Agriculture in the future, era 5.0 is agriculture that collaborates between agrotechnology, chemistry, especially biochemistry, and the Internet. Or it's also said that agriculture is integrated. All of that serves human needs and is controlled by humans from far separate places connected to cyberspace. Human health control also goes back to natural or herbal ingredients, which breed through genetic engineering techniques.

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