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JOHN'S CORNER:

NEWS FROM THE WONDERFUL WORLD OF SOIL AND PLANTS

by John Ferguson

A paper in the journal *Frontiers in Forests and Global Change* (2020) was on carbon storage by trees. The researchers found that the largest 3% of the trees accounted for 42% of the total above ground carbon stored within the forest systems studied in Oregon and Washington.

If a tree ring is added each year to the circumference of a large tree, then it is obvious that it will store more carbon than a small tree. This means we need to protect our large trees from logging, forest fires or other destruction.

Many cultures have used herbs and berries as natural medicines for thousands of years. The plant *Artemisia annua* (Sweet Wormwood, Sweet Annie, etc.) has been used as a treatment for malaria. The anti-malaria drug Artesunate contains two compounds from the artemisia plant.

Additionally, this plant has been found to have anti-cancer and anti-viral properties. Researchers at several universities are studying its use as a treatment for covid-19.

So far, they have found that a tea made from the leaves provided more anti-viral activity than when the compound is used in a drug.

For decades we have known that many animals use bio-minerals to produce a body armor (crustaceans, sea urchins, etc.). The research published in the *Journal Nature*



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Communications (2020) has found the first example of insects using bio-minerals as armor.

Researchers at the University of Wisconsin-Madison noticed that Leaf Cutter ants had a whitish coating on them. They discovered that it was a bio-mineral that developed as the ants mature, which increased the hardness of their exoskeleton. The armor is made from a high magnesium calcite which increased the hardness of the armor.

Leaf cutter ants are territorial, and often fight. They observed that ants without this armor always lost and those with the armor always won their battles. It is also believed that it helps protect them from a pathogenic fungus.

Many plants make bioactive compounds called saponins. Soysaponins found in soybeans have anti-cancer and antioxidant properties. The Licorice plant produces saponin glycyrrhizin a natural sweetener.

A study published in the journal Nature Communications (2020) by researchers at Chiba and Osaka Universities discovered a new enzyme that is used by plants to produce these chemicals. This enzyme is similar to those used in legumes to make cellulose in plant cell walls. They hope this discovery will lead to new products.

A paper published in the journal Science of the Total Environment (2020) has found a new way of cooking that removes some of the arsenic found in rice. It removed 50% of the arsenic in brown rice and 74% in white rice.

Researchers at the University of Sheffield called this new method PBA (parboiling with absorption method). Rice as a plant species accumulates ten times more arsenic in its cells than other grains and plants.



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“This new method involves parboiling the rice in pre-boiled water for five minutes before draining and refreshing the water, then cooking it on a lower heat to absorb all the water.”

The arsenic accumulates in the outer bran layer. Hence the milling of white rice removes much of the arsenic containing bran layer, but removes 75-90% of the nutrients and is why brown rice is far more nutritious. This new cooking method removes a lot of the arsenic in brown rice while keeping most of the nutrients.

More and more folks are talking about a concept called “One Health” as a large majority of our human health problems are directly linked to the poor quality of our food supply and lack of environmental stewardship worldwide.

Simply defined:

Soil health → Plant Health → Animal Health → Human Health → Environment Health → Planet Health

One health is not a new concept as it has a rich history in the bible. Moses recommended that the people observe as they entered Canaan. “See what the land is like and weather the people who live there are strong or weak, few or many. What kind of land do they live in? Is it good or bad? How is the soil? Is it fertile or poor? Are there trees on it or not? Do your best to bring back some fruit of the land.” Numbers 13:18-20

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