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NEWS FROM THE WONDERFUL WORLD OF SOIL AND PLANTS

By John Ferguson

Researchers at the University of British Columbia have discovered a new branch on the tree of life. They discovered a new supergroup of microbes that are a branch of the eukaryotes nicknamed “lions of the microbial world.”

This new group has two divisions based on how they eat. The first group is named “nibblerids” since they nibble their prey to death, one bite at a time with their toothlike structures. The second group is called “nebuilds” that eat their prey whole.

Even though they are few in number compared to other microbes, they are believed to be essential to a healthy microbial community. Nature (2022).

As we continue to study soil science and how it affects our plants and ultimately our health, we continue to see the importance of eating organically grown food.

Modern research has found that organic free range grass-fed cows produce butter that is very good for our health in many ways. These benefits range from having a high satiety value so we eat less high calorie junk food to protecting the nerves in our brains and helping prevent dementia.


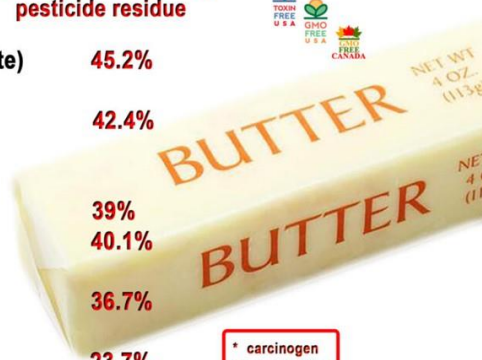

The USDA recently released their study on butter and found that conventionally produced butter had 8 different pesticides in it in 2013, but by 2021 the number of pesticides had increased to 15 different pesticides.

As the old saying goes “you are what you eat.”

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By using toxic chemicals, we have taken something God gave us that was good for us, and ruined it.

WHAT'S IN YOUR BUTTER?
NEW USDA PESTICIDE TESTING REPORT (2021)
CONVENTIONAL BUTTER

Most widely found pesticides:	% Samples containing pesticide residue	
DDE* (DDT Metabolite)	45.2%	  <div style="border: 1px solid red; padding: 2px; display: inline-block;"> * carcinogen ** reproductive toxin *** neurotoxin </div> 
Novaluron**	42.4%	
Permethrin***:		
Metabolite 1:	39%	
Metabolite 2:	40.1%	
Bifenthrin***	36.7%	
Piperonyl Butoxide	23.7%	
Cyhalothrin***	23.2%	

FOOD JUNGLE SURVIVAL TIP:

Buy organic to reduce your exposure to toxic synthetic pesticides and their metabolites.

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 toxinfreeusa.org
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Slide image from the newsletter www.ToxinfreeUSA.org

The January 2023 issue of Acres USA magazine had a very nice article titled "How Do Plants Get Nutrients?". A few takeaways from the article are:

- healthy plants require all the elements on the periodic table whether we understand the element's role in plant health or not. Elements are what compose minerals and this is why re-mineralization is so important. No minerals mean no elements for the plants.

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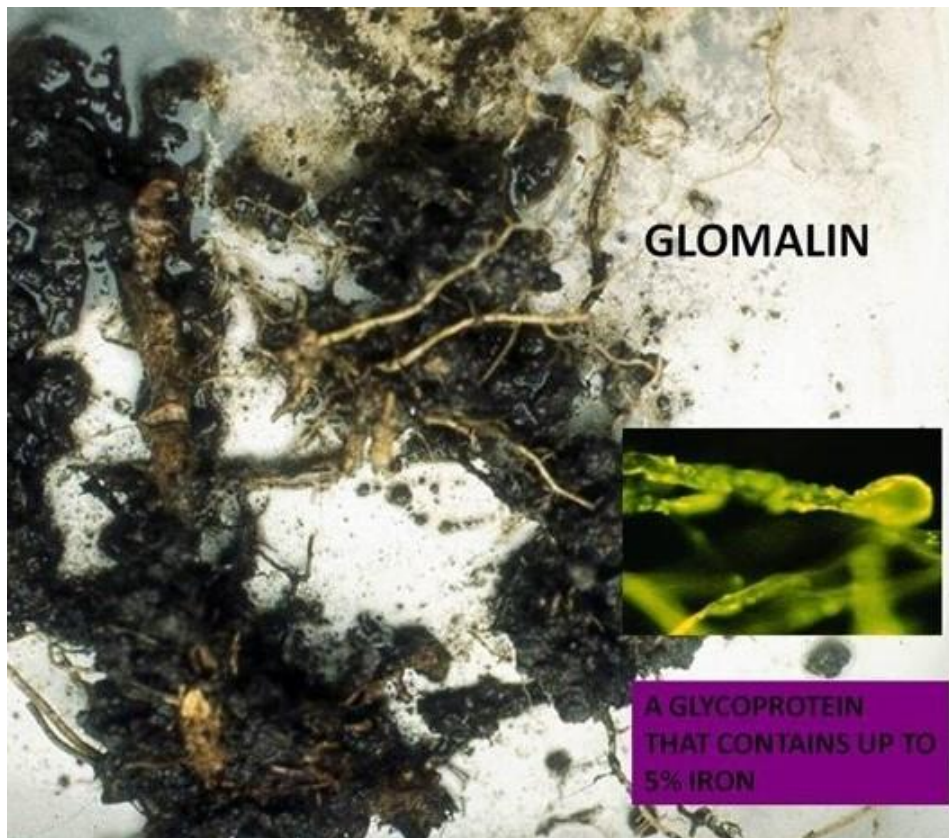
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- diversity of microbial communities within a natural system must be extremely high to work efficiently and provide maximum benefit.
- mycorrhizal fungi are nature's most important tool in extracting elements from the minerals in the soil.
- mycorrhizal fungi are also the internet of the soil connecting the roots of different plants allowing them to send messages to each other.
- the hyphae of mycorrhizal fungi also serve as a conduit that allow plants to share nutrients (elements) with each other. For example – one plant might be growing in soil with lots of zinc but little cobalt and another plant is growing in an area with little zinc but plenty of cobalt, hence they trade nutrients and the fungi is the pipeline that connects them. The plants pay the fungi by supplying them with root exudates (microbe food).
- the fungal hyphae also share information about an insect or disease attacking one plant with other plants on the network. This allows the other plants to rev up their immune systems to resist the pest or disease.
- the host plant will signal the fungi that they need a certain element for growth and the fungi will communicate this need throughout the network. Once the element is found, helper bacteria would help solubilize the nutrient (element) and then the fungi will transport the element back to the plant in need.
- fungi hyphae also produce oxalic acid (one of the strongest organic acids) that allows fungi to drill their way through solid granite capturing the elements released along the way.
- as the hyphae grow, they produce an extremely concentrated organic carbon source that we call Glomalin which is a very stable glycoprotein. Glomalin is a soil

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glue that glues soil particle together creating soil structure as shown in the image below.

This structure allows better soil aeration and water infiltration and increases water holding capacity through the aggregation of the soil particles.



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