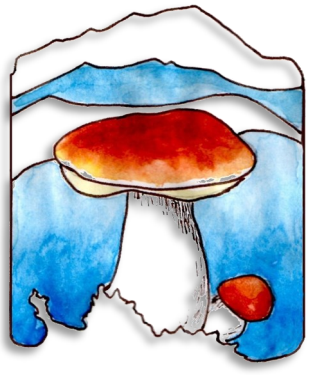
The Newsletter of the Pikes Peak Mycological Society 1974 - 2016 Vol. XLII Issue 4 July 2016

Spore-Addict Times



MONTHLY MEETING

WHEN? Monday, July 25, 2016 - The 4th Monday of the month.

WHAT TIME? 6:00 pm; The meeting will come to order at 6:30 pm

WHERE? Penrose Library - Carnegie Reading Room, 20 N. Cascade Ave, Colorado Springs, CO 80903

Website: www.pikespeakmushrooms.org

Contact: PPMSmail@gmail.com

PROGRAM

The Shifting Climate: Presented by Brian Barzee

Foray Coordinator Needed!

We are in need of a Foray Coordinator this season!

If you enjoy participating in our forays and are good at disseminating information, this job is for YOU!

No mycological experience necessary.

Please contact Hoa Pham for more information.

Call for Newsletter Articles

If you find an article about mushrooms that you think would be of interest to the PPMS membership, please send it (or the link) to PPMSmail@gmail.com. Or you can write your own article and send it in as well. You can also send a mushroom photo that you have identified and we will try to find a place for it somewhere.

Plants' ability to slow climate change depends on their fungi

BY HAYLEY DUNNING
30 JUNE 2016

Most plants associate with fungi in their roots

Scientists have discovered why only certain plants can take in extra carbon dioxide when levels rise and help to reduce global warming.

Plants take in carbon dioxide for growth, and in a greenhouse, raising the levels of carbon dioxide can boost their growth. This boost is known as the 'CO2 fertilisation effect'.

This effect also works on a global scale, with plants currently absorbing about 30 percent of human CO2 emissions. This helps to remove some extra CO2 from the atmosphere, slowing down the rate of climate change.

However, it was not known whether this effect would continue indefinitely, and plants would continue to take up the same percentage of extra CO2 emissions with rising levels. Experiments across the world that increase CO2 levels beyond current levels have given mixed results, with some showing greatly increased plant growth and associated CO2 uptake, and others showing little to no additional growth and uptake.

Now, new research led by scientists from Imperial College London has revealed that fungi are key to understanding how plants will behave. The study is published today

in *Science*, and includes researchers from Northern Arizona University, Indiana University and the University of Antwerp.

TAKING ADVANTAGE

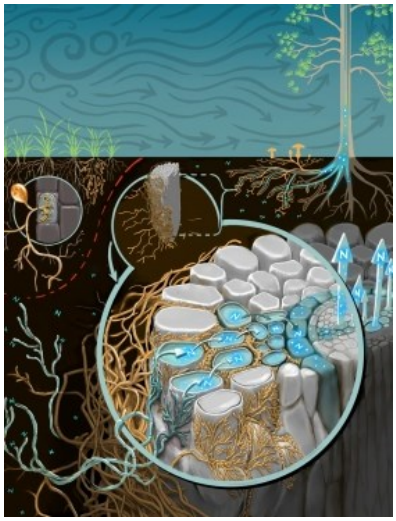
Most land plants associate with microscopic fungi in their roots, which provide their host plant with nutrients and water gleaned from the soil and receive carbohydrates in return.

The new study shows that those plants that associate with one of two main types of this fungi (Ectomycorrhizal fungi) can take advantage of higher carbon dioxide levels, whereas plants associated with the other type (arbuscular mycorrhizal fungi) cannot.

This finding helps scientists to predict how much plants will be able to offset future carbon dioxide emissions. Predictions will be helped by the fact that the type of plants that associate with either kind of fungi can be identified without checking the fungi in each one. For example, grassland plants typically associate with arbuscular mycorrhizal fungi, whereas coniferous forest plants typically associate with Ectomycorrhizal fungi.

Lead author César Terrer from Imperial's Department of Life Sciences said: "Our paper is a potential closure to the CO2 fertilization debate, and a huge step forward in climate science that will help make more accurate predictions of the effects of CO2 in the future."

MAKING THE BEST OF IT



The type of fungus a plant associates with is important because they affect how much nitrogen a plant can access from the soil. Nitrogen is an important nutrient that aids growth, and if nitrogen levels are low in the soil, then some plants are not able to take up enough.

So, even though there is extra carbon dioxide in the air, they cannot make use of it because they cannot get enough nitrogen to help the process of growth. Some plants, however, are still able to take in enough nitrogen even when it is limited in the soil. The differing ability of the plants comes from which type of microscopic fungi they associate with.

Ectomycorrhizal fungi are better able to take up nitrogen in the soil, and plants that associate with this type (known as ECM plants) can take advantage of higher carbon dioxide levels even when nitrogen is low, whereas plants associated with arbuscular mycorrhizal fungi (known as AM plants) cannot.

Terrer said: "The differences between ECM and AM plants had been suspected, but the effect had not been quantified; it had never been tested whether the effect of lower nitrogen on the CO2 fertilization effect was driven by differences between AM versus ECM."

WHERE THE GRASS IS GREENER

The team's analysed 83 CO2 fertilisation experiments, and showed that how well plants can take advantage of extra CO2 depends primarily on whether they are ECM or AM type. ECM plants were able to grow on average 30 percent more with increased CO2 and limited nitrogen, whereas AM plants did not grow any extra at all.

This is important when considering that the world's grasslands are predominantly AM type, and these areas often have limited nitrogen levels, so they will not be able to take advantage of the CO2 fertilization effect and help offset climate change.

However, Terrer notes that while this is a big step forward in creating a better picture of future CO2 levels, there are still other possible factors to consider: "It is important to be cautious when making predictions, because even though these experiments recreate the atmospheric CO2 concentration of the future, other effects of climate change are not taken into account, for example increased temperature or ozone concentration, which could diminish or even cancel the positive effects of CO2 in some plants."

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'Mycorrhizal association as a primary control of the CO2 fertilization effect' by César Terrer, Sara Vicca, Bruce A. Hungate, Richard P. Phillips and I. Colin Prentice is published in *Science*.

Wild Mushroom and Leek Risotto [Vegan]

Ingredients

For the Risotto:

1 shallot, peeled and finely diced
2 garlic cloves, peeled and finely diced
1/2 of 1 large leek, cleaned and thinly sliced
1 tablespoon organic cold pressed coconut oil
Vegetable broth
.35 ounces dried wild mushrooms, re-hydrated in a little stock water
1 cup Arborio risotto rice, rinsed
1/3 cup white wine
Sprig of fresh thyme, for serving

For the Vegan Parmesan:

1/2 cup cashew nuts
3 teaspoons nutritional yeast
1 teaspoon onion powder
1/2 teaspoon garlic powder
1/2 teaspoon salt

Preparation

To Make the Vegan Parmesan Cheese:

1. Place all ingredients into a food processor, and blend until fine.

To Make the Wild Mushroom and Leek Risotto:

1. Chop and prep all the vegetables.
2. On a medium heat, add the coconut oil and when hot add the shallot, garlic, and leek. Sauté for about 4 minutes.
3. Boil the vegetable broth. Put about 1/2 a cup aside in a small bowl and add the dried wild mushrooms to re-hydrate.
4. Add the rinsed Arborio rice to the sauteing vegetables and saute for 1 minute, stirring the rice thoroughly ensuring the rice gets coated in the sauteed oil.
5. Add the white wine and cook for a further 2 minutes.
6. On a medium-low heat, slowly begin to add the remaining broth, about 1/2 a cup at a time, stirring once added and then leaving to simmer for about 4 minutes. Then adding another half a cup and repeating this process until the rice has cooked through, but not stodgy.
7. Let the re-hydrated mushroom water be the last water you add. If you find you don't need to use all the stock water, that's fine, but the re-hydrated mushroom water will have a lot of flavor.
8. Cook for a further minute and then add the mushrooms, stirring gently, leaving a few for topping when serving. Add 2-3 tablespoons of the vegan Parmesan cheese, a pinch of salt, stir, and remove from the heat.
9. Garnish with a fresh sprig of thyme and serve.

Simple ways to use dried mushrooms

When you have dried mushrooms in the pantry, there are lots of quick and simple ways to use them in your everyday cooking. Once you rehydrate them, they can go just about anywhere fresh mushrooms can go.

- Stir them into pilafs and other rice dishes.
- Add them to tomato or cream-based pasta sauces.
- Spoon them onto polenta.
- Stir them into pan sauces for chops and cutlets.
- Add them to stir-fries. . Sauté with green beans or snap peas.
- Add them to eggs: Sauté rehydrated dried mushrooms with shallots and butter and fold into omelets, frittatas, or scrambled eggs.
- Make flavored butter: Pulse rehydrated morels or chanterelles with softened butter and a fresh herb like thyme in a food processor. Use right away or shape into a log, wrap in plastic, and refrigerate. Pats of the butter are delicious on roasted or grilled meats and vegetables.

The Pikes Peak Mycological Society, a nonprofit organization dedicated to the advancement of mycology, publishes Spore-Addict Times monthly from April–September.

Membership is open to anyone wanting to study mycology. Annual dues are $25 for individual and family memberships ($40 for a printed newsletter). **Submission of ideas, articles, reviews, letters, artwork and recipes are welcome.**

PIKES PEAK MYCOLOGICAL SOCIETY
c/o Warren Williams, 5131 N Mesa Dr.
Castle Rock, CO 80108

President	Brian Barzee 634-4715
Vice President	Ashley Anderson 660-2345
Secretary	Tina Renshaw (541) 571-0990
Treasurer	Warren Williams (303) 688-2913
Hospitality	Martha Zenger 277-7067
Foray Coordinator	**TBD** - Contact Hoa Pham if you are interested in the position
Newsletter Editor	Hoa Pham (727) 415-3550
Webmaster	Bud Bennett (719) 783-9209
Email Contact	PPMSmail@gmail.com

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Last month's entry was Clitocybe dealbata

Mystery Mushroom

I'm an edible mushroom that has an unusual and beneficial ability. I can destroy bacteria in the soil. My common name refers to a color, but it usually isn't exactly that shade. I am sometimes single, or clustered, and appear in late summer or early fall. My cap is 4-20 cm wide, smooth, tacky when moist, stipe is 3-10 cm. I am usually lavender to lilac, but can be brown or buff. My spore print is pale pink.

What am I?