Mycena News

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Speaker for the October 16 MSSF Meeting

Taylor Lockwood
Chasing the Rain

In December 1984, in the middle of the rainy season, Taylor moved to Mendocino, California. In his first week there, he "discovered" mushrooms, bought a camera, and started taking photos. Since then his work has appeared in the *New York Times* and many other publications. Taylor's newest book, *Chasing the Rain: My Treaure Hunt for the World's Most Beautful Mushrooms,* combines photographs and travelogues from around the globe. Join him for a fun, fast-paced slide presentation. Copies of *Chasing the Rain* will be available.

Inside This Issue...

MycoDigest: More Mushrooms Thanks to Climate Change?

Else Vellinga

The current changes in global climate have repercussions we can see for ourselves: glaciers are disappearing, snow packs are getting thinner, northern hemisphere plant species are expanding their areas northwards, some parts of the world are experiencing more flooding, others heat-waves, and the spring plants in the English countryside are flowering earlier and earlier.

We know that these events are happening, because there are records to show it. For instance, monthly records of temperature in Berkeley are available online at the site of the Western Regional Climate Center and go back to January 1, 1919. Winter snowfall and snow pack sizes are also monitored closely in California, as they provide most of our drinking water.

***Leucocoprinus birnbaumii* will be found outdoors more and more often as the world warms up.** Photographed by John Lennie, summer 2004, in a garden in Berkeley

For biological data, there are, in general, no government agencies that keep track of them, but in many places amateur naturalists have meticulously kept records about flowering dates of plants, emergence of adult dragonflies, and also the occurrence of mushrooms.

Anecdotal evidence, like "when I was a kid, the sulphur tuft never fruited before the first of October, now I find it at the end of August," is nice, but does not convince me, nor do the politicians or scientists, that there is any change. Data, hard core data, long term data, preferably collected in a standard way—this is what is needed. Fluctuations from year to year, caused by changes in weather, have to be filtered out before we can say anything about the long-term, about the trends caused by climate changes.

Continued on page 7

MycoDigest is a section of *Mycena News* dedicated to the scientific review of mycological information.

MycoDigest continued

Two studies have examined the fruiting periods of mushrooms. The first one was published in 1993 and explores 20 years of mushrooms in Saarland, western Germany; the second one looks at over 50 years of mushroom records in southern England.

Fruiting time of the mushrooms in Saarland underwent many changes in the period of 1970–1990. At that time, global warming was not named as the culprit, but in hindsight it might have played a big role. Interestingly, there are several trends: a third of the species (e.g. *Amanita vaginata*) kept fruiting longer or shifted their fruiting periods in these 20 years. Others, such as the blewit, *Lepista nuda*, did just the opposite and fruited for a shorter period. Around 20 percent of the species did not show any difference. The observed changes were not due to a change in pollution levels, and it could not be said that the species were doing better.

Data from the last 56 years collected by amateur mycologists who kept meticulous records of all mushrooms around Salisbury, England, were recently analyzed, resulting in a paper in the prestigious journal, *Science*. The same general trend of longer fruiting periods was noticed: species fruited earlier in the year and kept fruiting longer. These changes were more evident and had happened faster from 1990 to 2005—in other words, after the German study was completed. These changes are correlated with the higher temperatures in August, and to a lesser extent, the increasing amounts of October rain. In recent years, the weather in that nook of the world broke many records; just now England has experienced the wettest summer in 200 years with much flooding.

My Dutch friends told me that king boletes were still fruiting in the beginning of January this year, though before 1995 they had never been found after the end of November. Not only has there been longer autumnal fruiting, but many species, especially wood decayers, have started to fruit twice a year, with a second fruiting in spring. This phenomenon was unseen before 1975.

These two studies show the distinct changes that happen in northwestern Europe with its maritime climate, but what about California? Weather-wise, the predictions are that the summers will be warmer, partly because of a warming of the sea current in front of the coast, and winters will be wetter and warmer. It might mean that the fruiting patterns in the mountains will change dramatically, because of less snow fall and more rains. We have to wait and see what will happen in the coastal ranges. If, on the other hand, California will experience more droughts, as is already happening in the southwest, there will be much less fruiting happening than in the past.

But temperature and rain fall are not all that is changing; the amounts of CO_2 and ozone in the atmosphere have increased and will keep on increasing. Studies of the effects on fungal communities of artificially high amounts of these compounds indicate that there will be distinct changes in the composition of the mycoflora: species will come and go.

Our most urgent question as mycologists is to understand what the changes in mushroom production mean for the ecosystems as a whole. Will spring fruiting of saprotrophic species cause wood and litter to undergo faster decomposition? What is the influence of a different set of mushroom species on tree functioning? Are longer fruiting times for ectomycorrhizal species caused by longer growing seasons for the trees and what does that imply for global carbon flows?

Answers to these questions need data and the message for us is clear: in order to keep track of the changing environment, we need to make record keeping and maintaining databases of our mushroom finds a priority. ❁

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Officers: 2007-2008

President: J.R. Blair
(650) 728-9405 / jrblair@mssf.org

Vice President: Dan Long
(925) 945-6477 / danlong@astound.net

Secretary: Phil Brown
(510) 526-4325 / towltek2000@msn.com

Treasurer: Lisa Bacon
(707) 765-9085 / lisa.bacon@comcast.net

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Co-Editors & Layout: Cordelia Chadwick / Jeffrey Fisher
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