Towards a monograph of Russula in the eastern USA

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Peniophora
Russula
Lactarius/Lactifluus

Russulales
relative importance of genera

5700 published names
329 taxa described from USA
+ 87 additional European taxa reported

416 taxa total
(2005)
Origin of described taxa by State

- 1 to a few collections
- 5 to 10 collections

Species by state
Identification…. easier said than done!

• Several problems:
  – Nearly all of the available species descriptions lack modern precision
  – European keys are used without critical observation
  – The majority of Russulas in USA is still undescribed
  – Local experts on American Russula are urgently needed, therefore amateur and professional mycologists need to interact and collaborate more
Russula description in the USA

- = no or very limited monograph
# Ingratula

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<th>Ingratula</th>
<th>Crassotunicatinae</th>
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<td>Farinipedes?</td>
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<td>pulverulentia</td>
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<td>Fistulosinae ?</td>
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<td>???</td>
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Correspondence with the actual classification:


Subsect. Subvelatae


(Subsect. Elasticae subsect.nov.)
Russula hixsonii Murrill
ENGLISH

European Russula phylogeny project

For molecular research in mycology, tissues that have been conserved in CTAB buffer are the best solution for successful extraction of good quality DNA (allowing for instance to amplify and sequence in particular single copy genes that are now more and more used for phylogenetic purposes). For this purpose I send you 1.5 ml eppendorf tubes, filled with 0.5 ml CTAB 2x buffer.

There are however a few important points to remember:

A. Sampling protocol

1. Sample the tissues as soon as possible after collecting the fungus (you can even do it in the field if there is time for it).
2. Use a clean pinzet (with tips not necessarily sterilized, but at least well cleaned with soft paper tissue drenched in alcohol 70% or higher).
3. Choose parts of the gills that look perfectly clean, that are not parasitized by molds and not attacked by animals or other microorganisms (insect larvae, collemboles, mites, etc.). If gills seem not very clean, you can also cut the mushroom lengthwise and take tissue sample from the firm parts of the flesh inside cap or stipe.
4. Take about the quantity of gill or flesh tissue that corresponds to ½ of the amount of CTAB liquid in the tube…not more.
5. Close the eppendorf very tightly when finished.
6. Write the collection number on the side of the tube, and also on top of the lid, using a fine permanent marker.
7. Repeat step 3 to 6 for a second tube (I need 2 tubes for every specimen, 3-4 for very rare species).
8. Note essential features of the collection: smell, taste of gills, macrochemical reactions, color changes, take pictures for color, form etc…
9. Having vouchers is very important! therefore dry at least ½ of the mushroom and conserve it in a plastic bag with the same number to be sent to me later for deposit at PC herbarium.

B. Keep a list of the tissue samples and vouchers:

Tube nr./ your collection nr./species epithet/ eventual remarks
Below an example of part of such a file from last year (by JM Trendel):

| JMT-58 | JMT-08092807 | badia |
| JMT-59 | JMT-08092804 | xerampelina cf |
| JMT-60 | JMT-08092806 | nauseosa ? |
| JMT-61 | JMT-08092802D | atrorubens | ex. petit à droite |
| JMT-62 | JMT-08092801G | sardonia | ex. au 1er plan à gauche |

Recommendations for the data file:
- since you are quite a number of people collecting Russula samples, it is recommended to put always your initials before your numbers!
- use expressions such as “cf”, “aff.”, “group”, “?” etc…after the species name…not before (in view of sorting by name later)
- you can add notes or remarks about photos etc…any info you like
Although Russula, Lactarius and the other russuloid fungi show many affinities with other macrofungi, their study and description requires the use of some techniques which are not always well-known by everyone. In this section of the web site we are therefore providing extensive notes on this subject, suggesting how any collection of Russulales should be observed.

**What to observe and how to do it?**

**What to illustrate and how to do it?**

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**Tools for Identification of Russulales**

The European Russula and Lactarius-flora is well covered by a good number of monographs and field-guides, which provide tools for the identification of these fungi both to the beginner and the professional mycologist. The situation is much different in other continents, where such tools are seriously lacking. One of the aims of RussulaNews is to make available on-line some new tools, keys and so on which can aid you in naming your collections.

Should you want to contact us, e-mail us at russulales_news@yahoo.fr.

Geoffrey Kibby and Raymond Patto

**On-line synaptic key to North-American Russulas**

This on-line tool represents an updated version of the synaptic keys published by Kibby and Patto some years ago, and allows to quickly check the characters of your collections to see which species match the chosen criteria.

Bart Buysk

**Provisional key to subsection Virgineatinae in the U.S.**

This provisional key will help Russula amateurs to identify the species of subsection Virgineatinae in North America, including several new taxa which are in the process of being described.

Jannicke Huyninck & Annemarieke Verheken

**Key to the European species of Lactarius sect. Delicius.**

A useful key to distinguish the European milk-caps belonging to sect. Delicius (mostly with orange or red milk). This key is one of the results of the thorough study of this group made by the two authors.

Bart Buysk

**On-line key to the European species of Russula.**

A multiple-entry key to European Russula species based on macroscopical and ecological features is being prepared by Bart in cooperation with Vincent Kollen (CBS, The Netherlands), using Vincent’s BiolMICS software.

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Thank you!

• … and thanks to:
  – all collaborators in the field (David & Patricia Lewis, Donna Mitchell, Bill Roody, Jay Justice, Arleen Bessette, Glenn Boyd, Raymond Fatto, Gene Yetter, Roy Halling, Alejandro Kong Luz)
  – in the lab (Valerie Hofstetter, Jeri Parrent, Rytas Vilgalys)
  – with type studies (Slavomir Adamcik, curators of the main Russula herbaria in the US: NYS, NYBG, FLAS, MICH, F)
  – website creation and updating (Marco Floriani, the Russulales News team… )
  – Travel funding (PPF Ph. Janvier, MNHN, Paris)
  – Sequencing (‘Phylogeny of life’-project, MNHN, Paris)
A new key based on characters for generic subdivision is urgently needed!