

**LACTARIUS**

**SYNOPTIC KEYS TO**

**BRITISH**

**SPECIES OF LACTARIUS**

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Revised and updated by Archie McAdam with  
Patrick Leonard's help and supervision

## Notes and Abbreviations

- AM: Marchand, A. (1974) *Champignons du Nord et du Midi*. **Volume 6**
- BFF9: Watling, R. & Turnbull, E. (1998). *British Fungus Flora Volume 8*. Royal Botanic Gardens, Edinburgh.
- Bon: Same as MB below
- CBIB: Legon N.W. & Henrici A. (2005). *Checklist of the British and Irish Basidiomycota*. Royal Botanic Gardens, London.
- C&D: Same as RC below
- FNE2: Heilmann-Clausen, J., Verbeken, A., & Vesterholt, J.(1998). *Fungi of Northern Europe II. The genus Lactarius*. The Danish Mycological Society, Copenhagen.
- FungEur7: Basso, M.T. (1999). *Lactarius, Fungi Europaei. Volume 7*.
- MB: Bon, M. (1987). *The Mushrooms and Toadstools of Britain and North-western Europe*. Hodder and Stoughton, London.
- NCL: Dennis, R.W.G., Orton, P.D., & Hora, F.B. (1960). *New Check List of British Agarics and Boleti (Parts I&II)*.
- P-A M: Moreau, P-A. (2006) Comments on Swiss 6 (ref below) in: *Documents Mycologiques* **6** :144-148
- Ph: Phillips, R. (2006). *Mushrooms*. Macmillan, London.
- RC: Courtecuisse, R. & Duhem, B. (1995). *Mushroom and Toadstools of Britain and Europe*. HarperCollins, London.
- Swiss 6: Kränzlin, F. (2005). *Fungi of Switzerland. Volume 6*. Verlag Mykologie, Lucerne.

### Synonyms

Users of this *Lactarius* Key should understand that other names of the species here described are to be found in the literature. These synonyms are best understood by referring to the *Checklist of the British and Irish Basidiomycota*, the best source of the information at this time.

### Coverage

This document covers all the species listed in the *Checklist of the British & Irish Basidiomycota*.

### Rare species\*\*

These species have been reported rarely or occur in habitats that are so specialized that the habitat itself is rare. If one of these is found it is very important to record it thoroughly with photographs of the fruit body and habitat if possible and with carefully dried voucher material. It should then be reported to the recorder of your own Fungus Group or directly to the Mycological Section at Kew.

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## CHARACTERS THAT YOU MUST RECORD IN ORDER TO DETERMINE A LACTARIUS SPECIES USING THESE KEYS

The characters you need to record for a *Lactarius* can be very different to those that you might record for another genus. Modern keys to *Lactarius* use field and macro-characters to a much greater extent than for other genera. The characters are divided into three groups:

1. Those which must be recorded in the field.
2. Macro-characters that may be recorded in the field or the following day.
3. Micro-characters.

For each character the options are listed so that you can use this sheet as a tick list, Colours can be checked in the British Fungus Flora's "Colour Identification Chart" using the reference number in brackets.

### Field Characters:

**Habitat:** poplars or willow — oak — birch — beech —, hornbeam — alder -- hazel — broadleaf — pine — fir — spruce — conifers.

**Milk colour:** White (1) — yellow (53) — carrot (48) — watery or cloudy.

**Milk taste:** hot -- acrid — mild. (A small drop on the tip of the tongue only!)

**Milk colour change:** white (1) to yellow (50, 53, 54 or 55) — white (1) to violet (74 & 82) or pink (76) --- white (1) to red (42) or red brown (20) — white (1) to grey (34) or green (62) or grey-green (65) — carrot (48) to wine red (41). (Note: some species with white milk only turn yellow when a drop is put on a paper tissue and allowed to dry, record these separately)

### Macro-characters:

**Cap colour:** refer to the British Fungus Flora Colour identification chart.

**Cap shape:** convex — depressed — infundibuliform (funnel-shaped).

**Cap zoning:** zoned --- un-zoned.

**Cap texture:** glabrous (smooth) -- pruinose (minutely hairy) — tomentose (hairy) — matt (dry) — viscid — glutinous (greasy). (Note: a good way to check the matt or greasy character is to use the "kiss test" — passing the moistened cap across your lower lip)

**Cap margin:** striate (sulcate) — smooth — glabrous — pruinose — tomentose — wavy.

**Cap size:** in centimetres

**Stem colour:** concolorous (same as cap) — lighter (white or distinctly lighter than cap) — darker

**Stem marking:** none — scrobiculate (blotches or coloured pockmarks) — colour band at apex.

**Gill colour:** white (1) — cream (3) — ochre (6+) — pinkish (30) — staining on bruising (only works when fresh).

**Gill spacing:** normal — crowded — distant — forked — anastomising.

**Flesh colour:** white — yellow — pink — blue — carrot — salmon.

**Smell:** absent — coconut (as in desiccated coconut) — curry (or fenugreek) — bed bugs (distinctive *smell of *Lactarius quietus** — you will have to learn this one!) — herrings — camphor — pelargoniums — rubber (old tyres).

### Microscopic characters:















**Spore size:** in micrometres (microns),  $\mu\text{m}$ .

**Spore print colour:** white (1) — pinkish (very light tint of 30).

**Spore ornamentation:** spines — connectives — ridges — wings

## CODINGS FOR LACTARIUS SPECIES

### Milk Colour when gills are cut, and then dry on gills after one hour:

- |   |  |   |
|---|--|---|
| A | White and unchanging                   |    |
| B | Yellow, or white then yellow           |  or  then    |
| C | White then blue, violet, grey or green |  then  or  or  |
| D | White then red or pink                 |  then  or    |
| E | Carrot or wine red                     |  or   |
| F | Watery or cloudy                       |    |
















### Milk taste:

- G Hot or acrid  
H Mild or bitter

### Cap edge:

- I Hairy  
J Smooth

### Cap colour:

- |   |   |   |
|---|---|---|
| K | White, including white with rusty stains. (BFF 1)   |    |
| L | Cream and pale buff or pink colours. (BFF 2-6, 31 & 52)   |     |
| M | Blue, grey, green, blue-grey, grey-green, grey buff, vinaceous or violaceous.<br>(BFF 34,35, 61, 62, 63, 64-70, 74-77, 79-81) |        |
| N | Yellow, orange, brown, apricot, sienna, sepia or black (BFF 8-28, 44-49)  |       |

### Cap markings:

- Q Zoned  
R Un-zoned

### Smell:

- S Coconut  
T Spicy, aromatic, curry or camphor  
U Bed bugs, oily or fishy  
V Other weaker smells including acidic, fruity or none

### Habitat:

- W Alder  
X Conifers or birch  
Y Broadleaved trees  
Z Sub-alpine shrubs

ALPHABETICAL LIST OF CODINGS FOR LACTARIUS SPECIES

| Code:  | Species | FNE 2 Page ref      |
|--|---------|---------------------|
| AG: Milk remains white and tastes hot or acrid |         |                     |
| AGIK   | R V X   | pubescens 160       |
| AGIL   | Q V X   | torminosus 156      |
|  | Q U Y   | mairei** 164        |
|  | Q V Y   | mairei** 164        |
|  | R U Y   | mairei** 164        |
|  | R V Y   | mairei** 164        |
|  | R V X   | pubescens 160       |
| AGIM   | Q V X   | spinosulus 166      |
|  | R V X   | turpis 42           |
| AGIN   | Q V X   | torminosus 156      |
|  | Q V Y   | mairei** 164        |
| AGJK   | R V X   | bertillonii** 254   |
|  | R V Y   | Key 1               |
|  |         | bertillonii** 254   |
|  |         | piperatus 248       |
| AGJL   | Q S W   | glyciosmus 170      |
|  | Q S X   | glyciosmus 170      |
|  | Q S Y   | glyciosmus 170      |
|  | Q V W   | lilacinus 168       |
|  | Q V Y   | acerrimus 124       |
|  | R S W   | glyciosmus 170      |
|  | R S X   | glyciosmus 170      |
|  | R S Y   | glyciosmus 170      |
|  | R V W   | lilacinus 168       |
|  | R V Y   | controversus 136    |
| AGJM   | Q V W   | lilacinus 168       |
|  | Q V X   | Key 2               |
|  |         | flexuosus 54        |
|  |         | flexuosus           |
|  |         | var roseozonatus 56 |
|  |         | spinosulus 166      |
|  | Q V Y   | flexuosus var       |
|  |         | roseozonatus 56     |
|  | R S X   | Key 3               |
|  |         | glyciosmus 170      |
|  |         | mammosus 172        |
|  | R V X   | turpis 42           |
|  |         | flexuosus 54        |
|  | R V W   | lilacinus 168       |

Code: Species FNE 2 Page ref

|      |     |            |     |
|------|-----|------------|-----|
| AGJN | QVY | Key 4      |     |
|      |     | evosmus**  | 126 |
|      |     | zonarius** | 130 |
|      | QTX | hysginus   | 80  |
|      | QUX | hysginus   | 80  |
|      | RTX | hysginus   | 80  |
|      | RUX | hysginus   | 80  |
|      | RVX | rufus      | 176 |
|      | RVY | Key 5      |     |
|      |     | evosmus**  | 126 |
|      |     | rufus      | 176 |

AH: Milk remains white and tastes mild or bitter.

|      |     |   |     |
|------|-----|---|-----|
| AHIM | QVX | spinosulus                                  | 166 |
| AHIN | QVY | mairei**                                    | 164 |
| AHJK | RVX | vellereus                                   | 252 |
|      | RVY | vellereus                                   | 252 |
| AHJL | QSX | glyciosmus                                  | 170 |
|      | QVX | musteus                                     | 76  |
|      | RSW | glyciosmus                                  | 170 |
|      | RSX | glyciosmus                                  | 170 |
|      | RSY | glyciosmus                                  | 170 |
|      | RVX | Key 6 (See Key 20 if milk turns gills pink) |     |
|      |     | musteus                                     | 76  |
|      |     | vellereus                                   | 252 |
|      | RVY | Key 7 (See Key 20 if milk turns gills pink) |     |
|      |     | pallidus                                    | 74  |
|      |     | subdulcis                                   | 194 |
|      |     | vellereus                                   | 252 |
| AHJM | QVX | spinosulus                                  | 166 |
|      | RSX | glyciosmus                                  | 170 |
|      | RSW | glyciosmus                                  | 170 |
|      | RSY | glyciosmus                                  | 170 |
|      | RVW | cyathuliformis                              | 210 |

| Code: |     | Species        | FNE 2 Page ref |
|-------|-----|----------------|----------------|
| AHJN  | QTX | porninsis**    | 134            |
|       | QUY | quietus        | 192            |
|       | QVX | porninsis**    | 134            |
|       | RTX | hysginus       | 80             |
|       | RUX | volemus        | 246            |
|       | RUY | Key 8          |                |
|       |     | fulvissimus    | 196            |
|       |     | volemus        | 246            |
|       | RVW | Key 9          |                |
|       |     | cyathuliformis | 210            |
|       |     | obscuratus     | 206            |
|       |     | omphaliformis  | 212            |
|       | RVX | Key 10         |                |
|       |     | aurantiacus    | 178            |
|       |     | sphagnetii     | 186            |
|       |     | tabidus        | 200            |
|       | RVY | Key 10         |                |
|       |     | aurantiacus    | 178            |
|       |     | rubrocinctus** | 202            |
|       |     | subdulcis      | 194            |
|       | RVZ | lanceolatus**  | 180            |

BG: Milk yellow, or white then yellow directly, or drying yellow on a tissue and tastes hot or acrid.

|      |     |                 |     |
|------|-----|-----------------|-----|
| BGIK | RVX | citriolens      | 120 |
|      | RVY | citriolens      | 120 |
| BGIL | QVX | citriolens      | 120 |
|      | RVX | citriolens      | 120 |
|      | RVY | citriolens      | 120 |
| BGIN | QVX | scrobiculatus** | 106 |
|      | RVX | scrobiculatus** | 106 |
| BGJL | RVX | resimus**       | 116 |
|      | RVY | decipiens       | 190 |
| BGJN | QVY | chrysorrheus    | 122 |
| RVY  |     | Key 11          |     |
|      |     | chrysorrheus    | 122 |
|      |     | decipiens       | 190 |



| Code: | Species | FNE 2 Page ref |
|-------|---------|----------------|
|-------|---------|----------------|

BH: Milk yellow, or white then yellow directly or on a tissue and tastes mild or bitter

|      |     |                 |     |
|------|-----|-----------------|-----|
| BHIN | QVX | scrobiculatus** | 106 |
|      | RVX | scrobiculatus** | 106 |
| BHJL | RVX | tabidus         | 200 |
| BHJN | QUY | quietus         | 192 |
|      | QVY | chrysorrheus    | 122 |
|      | RUY | fulvissimus     | 196 |
|      | RVW | Key 10          |     |
|      |     | cyathuliformis  | 210 |
|      |     | obscuratus      | 206 |
|      |     | omphaliformis   | 212 |
|      | RVX | Key 12          |     |
|      |     | hepaticus       | 188 |
|      |     | lacunarum       | 198 |
|      |     | tabidus         | 200 |
|      | RVY | Key 13          |     |
|      |     | chrysorrheus    | 122 |
|      |     | fulvissimus     | 196 |
|      |     | lacunarum       | 198 |
|      |     | tabidus         | 200 |

CG: Milk white then turning or drying blue, grey, violet or green and tastes hot or acrid

|      |     |             |     |
|------|-----|-------------|-----|
| CGIL | QVX | flavidus    | 92  |
| CGIM | RVX | turpis      | 42  |
| CGJK | RVX | glaucescens | 250 |
|      | RVY | glaucescens | 250 |
| CGJL | QVX | trivialis** | 70  |
|      | QVY | Key 14      |     |
|      |     | flavidus**  | 92  |
|      |     | pyrogalus   | 52  |
|      | RVX | trivialis** |     |
|      | RVY | Key 14      | 70  |
|      |     | flavidus**  | 92  |
|      |     | glaucescens | 250 |
|      |     | pyrogalus   | 52  |
| CGJM | QVX | Key 15      |     |
|      |     | trivialis** | 70  |
|      |     | uvidus**    | 82  |
|      |     | vietus      |     |
| QVY  |     | Key 16      |     |
|      |     | blennius    | 44  |
|      |     | circellatus | 50  |
|      |     | fluens      | 48  |
|      |     | pyrogalus   | 52  |

| Code:  |     | Species     | FNE 2 Page ref |    |
|--------|-----|-------------|----------------|----|
| CGJM   | RVX | Key 15      |                |    |
|        |     | trivialis** | 70             |    |
|        |     | uvidus**    | 82             |    |
|        |     |             | vietus         | 58 |
|        | RVY | Key 16      |                |    |
|        |     | blennius    | 44             |    |
|        |     | circellatus | 50             |    |
| fluens |     | 48          |                |    |
|        |     | pyrogalus   | 52             |    |
| CGJN   | QVY | pyrogalus   | 52             |    |
|        | RVX | Key 17      |                |    |
|        |     | trivialis** | 70             |    |
|        |     | pilatii     | 62             |    |
|        | RVY | pyrogalus   | 52             |    |

CH: Milk white, then turning or drying blue, grey, violet or green and tastes mild or bitter

|          |     |                       |     |
|----------|-----|-----------------------|-----|
| CHIN     | RVX | repraesentaneus**     | 104 |
|          | RVZ | repraesentaneus**     | 104 |
| CHJL     | QVX | uvidus**              | 82  |
|          | QVY | violascens**          | 86  |
|          | QVZ | salicis-reticulatae** | 98  |
|          | RVX | uvidus**              | 82  |
|          | RVY | Key 18                |     |
|          |     | aspideus              | 96  |
|          |     | violascens**          | 86  |
|          | RVZ | salicis-reticulatae** | 98  |
| CHJM     | QVX | uvidus**              | 82  |
|          | QVY | violascens**          | 86  |
|          | RVX | Key 19                |     |
|          |     | luridus**             | 84  |
|          |     | uvidus**              | 82  |
|          | RVY | Key 19                |     |
|          |     | luridus**             | 84  |
| uvidus** |     | 82                    |     |
|          |     | violascens**          | 86  |
| CHJN     | QVY | luridus**             | 84  |
|          | RVX | luridus**             | 84  |
|          | RVY | luridus**             | 84  |

Code: Species FNE 2 Page ref

DG: Milk white, then red or pink and tastes hot or acrid

|      |     |             |     |
|------|-----|-------------|-----|
| DGJL | RVY | Key 20      |     |
|      |     | acris       | 228 |
|      |     | pterosporus | 230 |

|      |     |             |     |
|------|-----|-------------|-----|
| DGJM | RVY | pterosporus | 230 |
|------|-----|-------------|-----|

DH: Milk white, then red or pink and tastes mild or bitter

|      |     |             |     |
|------|-----|-------------|-----|
| DHJL | RVY | Key 21      |     |
|      |     | azonites    | 238 |
|      |     | pallidus    | 74  |
|      |     | ruginosus** | 236 |

|      |     |             |     |
|------|-----|-------------|-----|
| DHJM | RVX | fuliginosus | 244 |
|      | RVY | Key 21      |     |
|      |     | fuliginosus | 244 |
|      |     | ruginosus** | 236 |

|      |     |              |     |
|------|-----|--------------|-----|
| DHJN | RVX | fuliginosus  | 244 |
|      | RVY | Key 21       |     |
|      |     | azonites     | 238 |
|      |     | fuliginosus  | 244 |
|      |     | romagnesii** | 234 |
|      |     | ruginosus**  | 236 |

EG: Milk carrot and tastes hot or acrid

|      |     |              |     |
|------|-----|--------------|-----|
| EGJN | QVX | salmonicolor | 138 |
|------|-----|--------------|-----|

EH: Milk carrot and tastes mild or bitter

|      |     |                   |      |
|------|-----|-------------------|------|
| EHJM | QVX | Key 22            |      |
|      |     | deliciosus        | 140  |
|      |     | derrimus          | 150  |
|      |     | quieticolor       | 142  |
|      |     | salmonicolor      | 138  |
|      |     | semisanguifluus** | 148' |

|      |     |                   |     |
|------|-----|-------------------|-----|
| EHJN | RVX | Key 22            | RVX |
|      |     | deliciosus        | 140 |
|      |     | derrimus          | 150 |
|      |     | quieticolor       | 142 |
|      |     | salmonicolor      | 138 |
|      |     | semisanguifluus** | 148 |

| Code:   |     | Species        | FNE 2 Page ref |     |
|---|-----|----------------|----------------|-----|
| FG: Milk watery or cloudy and tastes hot or acrid   |     |                |                |     |
| FGJL  | QVW | lilacinus      | 168            |     |
|   | RVW | lilacinus      | 168            |     |
| FGJN  | QVW | lilacinus      | 168            |     |
|   | QVY | evosmus**      | 126            |     |
|   | RVY | evosmus**      | 126            |     |
|   | RVW | lilacinus      | 168            |     |
| FH: Milk watery or cloudy and tastes mild or bitter |     |                |                |     |
| FHIM  | QVX | spinosulus     | 166            |     |
| FHJL  | RTX | helvus         | 174            |     |
| FHJM  | QVX | spinosulus     | 166            |     |
|   | RVW | cyathuliformis | 210            |     |
| FHJN  | RTX | camphoratus    | 214            |     |
|   | RTY | camphoratus    | 214            |     |
|   | RUY |                | Key 23         |     |
|   |     |                | camphoratus    | 214 |
|   |     |                | rostratus**    | 216 |
|   |     |                | serifluus      | 220 |
|   |     |                | subumbonatus   | 222 |
|   | RVY |                | Key 23         |     |
|   |     |                | camphoratus    | 214 |
|   |     |                | rostratus**    | 216 |
|   |     | serifluus      | 220            |     |
|   |     | subumbonatus   | 222            |     |

| <b>Key and Code</b>  | <b>Species</b>                    | <b>FNE p</b> |
|--|-----------------------------------|--------------|
| <b>Key 1 AGJK RVY</b>  |                                   |              |
| Cap glabrous, milk white with KOH  | <i>piperatus</i>                  | 248          |
| Cap pruinose, velutinous milk yellow with KOH  | <i>bertillonii</i> **             | 254          |
| <b>Key 2 AGJM QVX</b>  |                                   |              |
| 1. Cap squamulose  | <i>spinosulus</i>                 | 166          |
| Cap glabrous, smooth   | 2                                 |              |
| 2. Cap with violet pink colours and strongly zonate                                  | <i>flexuosus var roseozonatus</i> | 56           |
| Cap greyish, cap edge wavy and weakly zoned  | <i>flexuosus</i>                  | 54           |
| <b>Key 3 AGJM RSX</b>  |                                   |              |
| Cap diameter < stipe length, buff to blue-grey                                       | <i>glyciosmus</i>                 | 170          |
| Cap diameter > stipe length, greyish brown   | <i>mamosus</i>                    | 172          |
| <b>Key 4 AGJN QVY</b>  |                                   |              |
| Flesh tawny-salmon or pink on cutting, with oak                                      | <i>zonarius</i> **                | 130          |
| Flesh unchanging or different on cutting, strong smell of apples, with oak or poplar | <i>evosmus</i> **                 | 126          |
| <b>Key 5 AGJN RVY</b>  |                                   |              |
| Cap zoned, stipe short, with oak or poplar   | <i>evosmus</i> **                 | 126          |
| Cap unzoned, red-brown to dark brick and with conifers                               | <i>rufus</i>                      | 176          |
| <b>Key 6 AHJL RVX</b>  |                                   |              |
| Cap velutinous or dry and stipe tough  | <i>vellereus</i>                  | 252          |
| Cap viscid, under pines, with cladonia   | <i>musteus</i>                    | 76           |
| <b>Key 7 AHJL RVY</b>  |                                   |              |
| 1. Cap predominantly white or cream  | 2                                 |              |
| Cap rusty tawny, cinnamon, or brick  | 3                                 |              |
| 2. Cap viscid, stipe soft to firm  | <i>pallidus</i>                   | 74           |
| Cap matt, velutinous, stipe hard   | <i>vellereus</i>                  | 252          |
| 3. Flesh brown with sulpho-vanillin, with beech                                      | <i>subdulcis</i>                  | 194          |
| <b>Key 8 AHJN RUY</b>  |                                   |              |
| Flesh firm and green with FeSO <sub>4</sub>  | <i>volemus</i>                    | 246          |
| Flesh not very firm and not green with FeSO <sub>4</sub>                             | <i>fulvissimus</i>                | 196          |

| Key and Code  | Species                | FNE p |
|---|------------------------|-------|
| <b>Key 9 AHJN RVW + BHJN RVW</b>  |                        |       |
| 1. Cap yellow-brown to orange-brown,<br>becoming concentrically cracked with age                        | <i>omphaliformis</i>   | 212   |
| Cap with olivaceous tinges and not<br>concentrically cracking   | 2                      |       |
| 2. Olivaceous spot at cap centre, spores av 7µ+   | <i>cyathuliformis</i>  | 210   |
| Cap uniform colour with olivaceous<br>tinge, spores av < 6.5µ   | <i>obscuratus</i>      | 206   |
| <b>Key 10 AHJN RVX + AHJN RVY</b>   |                        |       |
| 1. Cap conspicuously radially wrinkled at the<br>centre, pileipellis a trich- or hypho-epithelium       | 2                      |       |
| Cap not radially wrinkled at centre, pileipellis different  | 3                      |       |
| 2. Stipe slender, 3 – 10 mm, and gills do not change<br>colour when rubbed and stipe colour uniform     | <i>tabidus</i>         | 200   |
| Stipe robust, 8 – 25 mm, and gills turn violaceous<br>when rubbed and dark collar at top of stipe       | <i>rubrocinctus</i> ** | 202   |
| 3. In sphagnum moss and under conifers and<br>cap with lighter edge                                     | <i>sphagnetii</i>      | 186   |
| In other habitats   | 4                      |       |
| 4. Cap bright uniform apricot to orange-brown   | 5                      |       |
| Cap dull cinnamon or clay-buff or vinaceous<br>buff and flesh brown with sulpho-vanillin,<br>with beech | <i>subdulcis</i>       | 194   |
| 5. Gills adnate with no tooth, spores with<br>some ridges   | <i>aurantiacus</i>     | 178   |
| Gills emarginated with a decurrent tooth,<br>spores with isolated warts                                 | <i>fulvissimus</i>     | 196   |
| <b>Key 11 BGJN RVY</b>  |                        |       |
| Milk immediately pale sulphur yellow, under oak   | <i>chrysorrhous</i>    | 122   |
| Milk slowly yellow on paper tissue and smell of<br>pelargonium  | <i>decipiens</i>       | 190   |
| <b>Key 12 BHJN RVX</b>  |                        |       |
| 1. Cap becoming radially wrinkled, pale-brown and<br>under birch or oak or spruce                       | <i>tabidus</i>         | 200   |
| Cap smooth  | 2                      |       |
| 2. Cap umber or dark orange brown & with pine   | <i>hepaticus</i>       | 188   |
| Cap bright orange and smooth, with birch  | <i>lacunarum</i>       | 198   |

| Key and Code   | Species                                | FNE p      |
|--|--|------------|
| <b>Key 13 BHJN RVY</b>   |  |            |
| 1. Milk immediately sulphur yellow, with oak<br>Milk yellow slowly or only on paper  | <i>chrysorrhoeus</i><br>2              | 122        |
| 2. Cap drab brown and becoming radially wrinkled<br>Cap rich orange-brown, not wrinkled  | <i>tabidus</i><br>3                    | 200        |
| 3. Stipe > 10 mm diameter, in dry habitats<br>Stipe < 10 mm diameter, in damp habitats   | <i>fulvissimus</i><br><i>lacunarum</i> | 196<br>198 |
| <b>Key 14 CGJL QVY + RVY</b>   |  |            |
| 1. Gills distant and dark pinkish buff<br>Gills normally spaced or crowded and cream   | <i>pyrogalus</i><br>2                  | 52         |
| 2. Milk staining gills reddish-violet<br>Milk staining gills greenish grey   | <i>flavidus</i><br><i>glaucescens</i>  | 92<br>250  |
| <b>Key 15 CGJM QVX + RVX</b>   |  |            |
| 1. Milk staining gills violet<br>Milk drying olivaceous-grey 2   | <i>uvidus**</i>                        | 82         |
| 2. Stipe apex narrowing, milk yellow with KOH<br>Stipe equal and pale throughout, milk does<br>not react with KOH  | <i>trivialis**</i><br><i>vietus</i>    | 70<br>58   |
| <b>Key 16 CGJM QVY + RVY</b>   |  |            |
| 1. Gills pale cream and under beech or oak<br>Gills cream or buff and under hazel or hornbeam  | 2<br>3                                 |            |
| 2. Heavy soils and white edge to cap<br>Lighter soils and cap edge concolourous  | <i>fluens</i><br><i>blennius</i>       | 48<br>44   |
| 3. Gills cream and under hornbeam<br>Gills dark pinkish buff and under hazel   | <i>circellatus</i><br><i>pyrogalus</i> | 50<br>52   |
| <b>Key 17 CGJN +RVX</b>  |  |            |
| 1. Cap dark brown, < 55 mm diam. umbonate,<br>stipe broadly cylindrical  | <i>pilatii</i>                         | 62         |
| Cap vinaceous grey, 40-150 mm diam, stipe<br>barrel-shaped, narrowing at apex  | <i>trivialis**</i>                     | 70         |
| <b>Key 18 CHJL RVY</b>   |  |            |
| Cap diameter < stipe height and with willow  | <i>aspideus</i>                        | 96         |
| Cap diameter > stipe height and with oak<br>or hornbeam  | <i>violascens**</i>                    | 86         |
| <b>Key 19 CHJM RVX + RVY</b>   |  |            |
| 1. Spores with partial reticulum and with willow<br>Spore reticulate and with other broadleaves<br>[Identifying these species is difficult so you might be best to consult a monograph]. | <i>uvidus**</i><br>2                   | 82         |
| 2. Chalky soils with oak or hornbeam<br>Damp alluvial soils  | <i>violascens**</i><br><i>luridus</i>  | 86<br>84   |

| <b>Key and Code</b> | <b>Species</b> | <b>FNE p</b> |
|---------------------|----------------|--------------|
|---------------------|----------------|--------------|

**Key 20 DGJL RVY**

|  |                    |     |
|--|--------------------|-----|
| Milk turning reddish rose when isolated on glass | <i>acris</i>       | 228 |
| Milk unchanged white when isolated on glass      | <i>pterosporus</i> | 230 |

**Key 21 DHJL RVY + DHJM RVY + DHJN RVY**

|  |                      |     |
|--|----------------------|-----|
| 1. Stipe white                                       | 2                    |     |
| Stipe coloured grey, clay or buff                    | 3                    |     |
| 2. With oaks, milk staining gills pink               | <i>azonites</i>      | 238 |
| With beech, milk drying pink                         | <i>pallidus</i>      | 74  |
| 3. Cap margin even                                   | <i>fuliginosus</i>   | 244 |
| Cap margin crenate (grooved)                         | 4                    |     |
| 4. Cap fawn to fuscous-brown, dark, gills broad      | <i>romagnesii</i> ** | 234 |
| Cap greyish-brown and not very dark,<br>gills narrow | <i>ruginosus</i> **  | 236 |

**[Note: The *fuliginosus* group above is notoriously difficult so make good notes and then refer to Fungi of Northern Europe Vol 2, and Fungi Europaei Vol 7]**

**Key 22 EHJN RVX**

|  |                           |     |
|--|---------------------------|-----|
| 1. With firs   | <i>salmonicolor</i>       | 138 |
| With spruce  | <i>deterimus</i>          | 150 |
| With pine  | 2                         |     |
| 2. Cut flesh turning orange brown (5min) then<br>vinaceous (60 min).   | <i>semisanguifluus</i> ** | 148 |
| Cut flesh broadly unchanged  | 3                         |     |
| 3. Milk remaining carrot and cap salmon and<br>stipe strongly scrobiculate                                     | <i>deliciosus</i>         | 140 |
| Milk slowly turning brown-vinaceous and<br>cap with grey or blue colours, stipe not<br>distinctly scrobiculate | <i>quieticolor</i>        | 142 |

**Key 23 FHJN RUY + RVY**

|   |                     |     |
|---|---------------------|-----|
| 1. Macrocystidia present                  | 2                   |     |
| Macrocystidia absent                      | 3                   |     |
| 2. Cap red-brown and rugose or granulose  | <i>rostratus</i>    | 216 |
| Cap dark-brick to orange-brown and smooth | <i>camphoratus</i>  | 214 |
| 3. Cap vinaceous brown to fuscous         | <i>subumbonatus</i> | 222 |
| Cap orange-brown to reddish-brown         | <i>serifluus</i>    | 220 |

**[Note: The *olentes* group is notoriously difficult so make good notes and then refer to Fungi of Northern Europe Vol 2, and Fungi Europaei Vol 7]**

**Patrick Leonard updated March 2008**



## LACTARIUS - DESCRIPTIONS

- acerrimus** FNE 124 **Cap** 7-12cm, smooth, sticky when wet, ochre yellow, margin lobed, orange (48) buff (52), strongly zoned, irregular, lobed, cap diameter > stem height. **gills** distant, strongly forked, strongly anastomosing, **milk** very acrid, white; **basidia** 2-spored; **spores** very large. 10-14x8-12µm. **Habitat** On soil in deciduous woodland, usually associated with *Quercus* spp. **Occurrence:** Occasional in England. Widespread but rarely reported elsewhere
- acris** FNE 228 **Cap** 3.5-8cm, viscid or dry and wrinkled, pruinose, umber (18) to chestnut (23), un-zoned, cap diameter < stem height; **stem** paler than cap; **gills** crowded, few forked, ochraceous; **milk** white turning pink quickly (< 1 min) even when isolated from the flesh, abundant, mild after a short time very acrid, then like shell-fish later;. [Note: if gills reddening, but not the milk, go to **ruginosus**]; **spores** 7-9x6-7.5µm. **Habitat:** On soil (often calcareous) in deciduous scrub or woodland, usually associated with *Corylus*, *Fagus* or *Quercus* spp. **Occurrence:** Rarely reported but apparently widespread. Often confused with closely related taxa and many of the records are unsubstantiated with voucher material. [P-A M: The chief character of this species in the *Plinthoglali* group is the pronounced yellowing of the base of the stem.]
- aspideus** FNE 96 **Cap** 4.5-10cm, smooth, viscid to shiny when dry, margin finely velutinous at first, pale straw (50) to pale yellow (55), un-zoned sometimes with violet stains; **gills** very pale yellow; **milk** mild then bitter, abundant, white then violet or very slightly pink (unchanging when isolated from the flesh); **spores** 8.5-9.5x6.5-7µm. **Habitat:** On wet soil in swampy areas in deciduous woodland, usually associated with *Betula* or *Salix* spp. **Occurrence:** Rarely reported but apparently widespread. [Cap < 4 cm, yellowish, under *Betula nana* in sub-alpine area: *salicis-reticulatae*]
- aurantiacus** FNE 178 **Cap** 3-6cm, smooth with a small pointed umbo, sienna (11), apricot (47) or orange (48); **gills** orange buff; **stem** concolorous; **milk** white, mild; **smell** none; **spores** 8-10x6.5-7.5µm. **Habitat:** On soil in woodland, associated with deciduous trees or conifers. **Occurrence:** Apparently common in Britain and Ireland. Previously recorded as *Lactarius mitissimus*
- azonites** FNE 238 **Cap** 4-10cm, , pruinose, un-zoned, buff (52) to smoke grey (34) to vinaceous buff (31); **gills** crowded, cream to bright ochre; **stem** subcylindric, firm, cap diameter < stem height; **flesh** carrot to dark red in 3 minutes; **milk** mild to bitter, turning red only on contact with gills; **spores** 8-9x7.5-8.5µm., almost complete network of ridges Under oak. **Habitat:** On loam or clay soil in deciduous woodland, usually associated with *Quercus* spp, less frequently with *Fagus* or *Corylus*. **Occurrence:** Generally rather uncommon and often confused with *L. fuliginosus*. Mainly reported from southern England, but known as far north as Northumberland. Rarely reported from Scotland and Wales [Note: if gills reddening, but not the milk, go to *ruginosus*]
- bertillonii\*\*** FNE 254 Seldom distinguished from *L. vellereus*. **Cap** 10-20cm, dry, velutinous, margin inflexed, white with a cream tinge; **stem** tapering downwards; **flesh** firm to very firm, solid; **flesh taste** very acrid after a while; **smell** very fruity with a suggestion of bread dough [P-A M]; **milk** white, unchanging, but changes to yellow with KOH; **taste** almost immediately very acrid; **spores** 6.9-9.8x5.0-7.5µm. **Habitat:** On soil in deciduous woodland, usually associated with *Fagus* and *Quercus* spp. **Occurrence:** Records from Gloucestershire and Wales (Breconshire) are unsubstantiated with voucher material.. **Comment:** In *vellereus* the milk does not change with KOH is mild while the flesh is acrid so milk has to be tasted separate from the flesh. This species is almost identical with *vellereus* but can be separated by the subglobose spores with reticulate ornamentation and by the thick-walled ends of hyphae in the cap cuticle
- blennius** FNE 44 **Cap** 4-10cm, smooth, viscid, grey olivaceous (61). olivaceous buff (63) with rings of. bay (19) olive grey, olive brown, pale greenish grey or purplish, appears zoned by ring zones of oily of spots; **stem** paler, **gills** crowded, white with grey stains, **milk** acrid, white turning slowly grey or grey-green; **spores** 7.5-8x6µm. **Habitat:** On soil in deciduous woodland, usually associated with *Fagus* in pure stands of beech woodland. Rarely reported with other trees. **Occurrence:** Very common and widespread.

**camphoratus** FNE 214 **Cap** 3-6cm smooth, dry, rusty tawny (14) to umber (18), darker at centre; **gills** crowded, pale flesh becoming rusty; **stem** slightly paler than cap, darkening towards the base, stem height = cap diameter; **milk** white or watery, mild; **smell** strongly aromatic, strengthens on drying; **spores** 7.5-8x6.5-7.5µm. **Habitat:** On soil (usually acidic) in woodland with deciduous trees or conifers, on heathland or occasionally on moorland. Often associated with *Betula* and *Pinus* spp, but also known with *Fagus* and *Quercus* spp, and reported amongst *Pteridium*. **Occurrence:** Common and widespread but few records from the Republic of Ireland..

**chrysorrheus** FNE 122. **Cap** 6-8 cm, smooth to greasy glutinous (sticky) when wet, shiny when dry (kiss test !) ± shiny, at margin finely, innately, fibrillose, cinnamon (10), convex, pale cinnamon (10) with yellowish tints, with well marked zones and spotted; **gills** crowded, pale ochre; **stem** paler than cap; **milk** rather abundant instantly chrome or sulphur yellow, drying cream-buff **Spores** 8-9.5x7-7.5µm. **Habitat:** Exclusively under oak. **Occurrence:** Common and widespread

**circellatus** FNE 50 **Cap** 5-10 cm, finely rough to finely squamulose especially towards margin, violaceous grey (61), olivaceous buff (63), with brown zones; **gills** crowded, sub-decurrent, yellow darkening to ochre; **stem** white to pale concolourous; **milk** acrid, white, slowly yellowish drying olivaceous buff. **spores** 7-8x5.5-6.5µm. **Habitat:** On soil in deciduous woodland, usually associated with *Carpinus* (hornbeam) but also known (much less frequently) with *Corylus*. **Occurrence:** Occasional but apparently widespread

**citriolens** FNE 120 **Cap** large, 10 - 20 cm, white (84) to straw (50), un-zoned, margin tomentose, not scrobiculate, scales turn ochre with age; **gills** buff, sparsely forked; **milk** acrid, white turning yellow; **stem** thick, hard, white, cap diameter > stem height; **spores** 7-8.5x5.5-6.5µm. **Habitat:** On soil in deciduous woodland, usually associated with *Betula* spp. Very rarely reported with *Fagus* and *Quercus* spp. **Occurrence:** Known from Berkshire, Herefordshire, Mid-Lancashire, North Lincolnshire, North Wiltshire, Surrey, Warwickshire, West Kent and West Sussex. Reported elsewhere but lacking voucher material.

**controversus** FNE136 **Cap** 10-30cm, greasy to viscid large white with pink tone, infundibuliform, glabrous; **gills** sub-decurrent, forked, crowded, and a beautiful bright flesh pink when young; **stem** white with pink spots, cap diameter > stem height; **milk** acrid, white. **spores** small, 5-7x4.5-5µm. **Habitat:** On soil in damp deciduous woodland or in dune slacks, often associated with *Salix* spp (frequently *Salix repens*) and with *Populus* spp. **Occurrence:** Occasional in England. Rarely reported elsewhere but apparently widespread.

**cyathuliformis** FNE 210 **Cap** 1.2-4.5cm with a distinct papilla; smooth, dry or slightly greasy, honey coloured, isabelline, cinnamon or yellowish brown, with a darker, olivaceous, fuscous or olive-brown 'eye', with age becoming translucently striate, ±hygrophanous;. **gills** often forked, at first cream to honey-coloured, later pinkish buff to isabelline; **stem**, isabelline, cinnamon, yellowish brown or orange-brown, palest at the top of young specimens; **smell** faint or somewhat fruity; **milk** mostly sparse, white to watery white, yellowing on a handkerchief; taste mild; **spores** 7.2-11.2x6.1-8.5µm – larger than those of *L. obscuratus*. **Habitat:** On soil, associated with *Alnus* and *Salix* spp, in wet areas in mixed deciduous woodland, in alder swamps and around the margins of lakes and ponds. **Occurrence:** Probably quite common and widespread but previously confused with similar taxa in similar habitats

**decipiens** FNE 190 **Cap** 2-6 cm, washleather, pale clay pink (30) to buff (52); **gills** concolorous or darker; **stem** concolorous but darker towards the base; **milk** white turning yellow on a paper tissue, acrid; **smell** of geraniums (pelargonium); **spores** 7.5 - 9 x 6.5 - 7.5 µm. **Habitat:** On soil in deciduous woodland. Most often reported with *Carpinus*, occasionally with *Corylus*, *Fagus* or *Quercus* spp **Occurrence:** Apparently widespread, but uncommon

**deliciosus** FNE 140 **Cap** 4-8 cm, viscid when wet, margin glabrous, ochre (9) orange (48), zoned; **gills** crowded, orange, **stem** scrobiculate, cap diameter > stem height; **milk** mild, scarce, carrot; **flesh** carrot when cut; **Spores** 7.5-9x6.5-8µm.. **Habitat:** On acidic soil in woodland or with solitary trees; strictly associated with *Pinus* spp. **Occurrence:** Common to occasional, but widespread.

**deterimus** FNE 150 **Cap** 5-15 cm, smooth, greasy, viscid when wet, orange (48) to brick (15), greening strongly with age, zoned, cap diameter > stem height; **gills** orange with green spots; **milk** bitter, carrot, slowly wine red; **spores** 8-10x7-9µm. **Habitat:** On soil in woodland (usually plantations) and strictly associated with *Picea* spp. **Occurrence:** Common to occasional, but widespread and apparently increasing as spruce plantations mature.

**evosmus\*\*** FNE 126 **Cap** 5-8 cm, surface finely rugulose, ± viscid, margin even, straw (50) to cream (4), to pale yellow, weakly zoned; **gills** white, reddening, somewhat forked; **stem** pale, cap diameter > stem height; **milk** very hot, white; **smell** of apples; **spores** 7-9x5.5-6µm. **Habitat:** On soil, usually associated with *Populus* or *Quercus* spp in woodland or scrub. Also collected recently in grassland where apparently associated with *Helianthemum nummularium* **Occurrence:** Rarely reported. British records are mostly from southern England and the Peak District (Derbyshire and Staffordshire). Reported from Wales (Caernarvonshire: Great Ormes Head) but without voucher material.

**flavidus\*\*** FNE 92 **Cap** 4.5-10cm, viscid, margin tomentose then glabrous, straw (50) to pale yellow (55), can be zoned; **gills** whitish; **milk** mild, white slowly turning violet on bruising. **taste** acrid; **smell** faint, apple-like. Spores 8.5-9.5x6.5-7µm. **Habitat:** On soil (often calcareous) in deciduous woodland, usually associated with *Carpinus*, *Fagus* or *Quercus* spp. **Occurrence:** Very rarely reported

**flexuosus** FNE 54 **Cap** 5-12 cm, smooth, viscid, often zonate in the outer half, pale leaden grey (75), zoned, irregular, margin wavy; **stem** thick, short, cap diameter > stem height; **gills** distant, yellowish; **milk**, immediately acrid, white, abundant; **spores** 7-8x6µm. **Habitat:** In grass on the edge of coniferous and deciduous forests and on soil in woodland, associated with *Betula*, *Quercus* or *Pinus* spp. **Occurrence:** Rarely reported but apparently widespread. The majority of reports lack voucher material.

**flexuosus var rozeozonatus** FNE 56 ‘is separated from *L. flexuosus* mainly by the cap colour, strong zonation ..... and apparently there are some differences in host preferences and geographical distribution.’ [FNE 56]

**fluens** FNE 48 **Cap** 5–10cm, smooth, veined, viscid, pale grey (34) to pale buff (52) with a pistachio (68) to olivaceous (62) wash, zoned (bright greenish olive with broad olive brown zones); **gills** distant, ivory; **milk** abundant, mild at first, white turning grey or grey green; **spores** 7.5-8.5x5-6µm. **Habitat:** On soil (often calcareous clay), usually associated with *Fagus* in beech woods but also reported with *Carpinus*, *Corylus* and *Quercus* spp **Occurrence:** Occasional but widespread. May be passed over as pallid basidiomes of *L. blennius*

**fuliginosus** FNE 244 **Cap** 3-10cm, dry, smooth, pruinose, like chamois leather, milky coffee (28), un-zoned; **gills** cream, bruising rusty red; **stem** dark, concolorous with cap, cap diameter = or < stem height; **milk** mild, white turning red; **spores** 8x10µm with distinct raised connectives. **Habitat:** On soil in deciduous woodland or with mixed conifers and deciduous trees. **Occurrence:** Frequently reported and apparently widespread, but commonly misidentified or confused with similar taxa such as *L. azonites* or *L. romagnesii*. Most records lack voucher material

**fulvissimus** FNE 196 **Cap** 3-8 cm, bright, apricot (44), to sienna (11), centre darker, gills ochre buff bruising brown; **gills** emarginate with a distinct decurrent tooth; **stem** . concolorous; **milk** drying yellow on a paper tissue, mild, rather abundant, slowly becoming unpleasant; **spores** 7-8x6-7µm. **Habitat:** On soil (often calcareous loam) in mixed deciduous woodland. **Occurrence:** Occasional but may be locally frequent in southern England, rarely reported elsewhere. Following FNE2 this includes *L. britannicus* (but non sensu Basso, 1999). [Often confused with *L. aurantiacus* which differs by a more unicoloured cap, broadly adnate gills without a decurrent tooth and by different microscopical features. See also *L. rubrocinctus*]

**glaucescens** FNE 250 **Cap** 5-12 cm, glabrous, white; **gills** decurrent, cream with pink tinge, crowded **stem** white, grey when bruised, cap diameter = stem height; **milk** acrid white, dries bluish green, yellow with KOH. Spores 5-8.5x4.5–7µm. **Habitat:** On soil in deciduous woodland. Associated with *Betula* and *Quercus* spp. **Occurrence:** Rarely reported. Known from Cheviotshire, East Sussex, Herefordshire, Westmorland and Yorkshire, and from Angus, East Perthshire, Easternness and West Sutherland. Reported elsewhere but without voucher material. May be confused with *Lactarius piperatus*

**glyciosmus** FNE170. **Cap** 3-6 cm, dull, dry, pruinose pale grey (1) to brownish grey (31/34), **gills** crowded, pale becoming ochre cream; **stem** white or very pale ochre; **milk** white, mild to very slightly acid; **smell** of coconut. Spores 8-9x6–8.5µm. **Habitat:** On acidic or sandy soil, associated with *Betula* spp **Occurrence:** Common and widespread but few records from Republic of Ireland.

**helvus** FNE 174 **Cap** 6-12 cm, clay pink(30) to pale vinaceous (76) sometimes with a violet or lilac tint, pruinose, to slightly squamulose at centre, un-zoned; **stem** concolorous, cap diameter = or < stem height; **gills** crowded, decurrent, pale yellow to concolorous; **milk** mild, sparse, watery white; **smell** faint when fresh, fenugreek (curry) when dry aromatic; **spores** 6.5-9x5.5-6.5µm. **Habitat:** On acidic soil in woodland, associated with conifers. In Britain usually with *Pinus* spp (but also with *Picea* spp in continental Europe) and occasionally with *Betula* spp. **Occurrence:** Occasional but widespread in England, rather common in Scotland and rarely reported elsewhere.

**hepaticus** FNE 188 **Cap** 2-6 cm, dry to slightly greasy, uniformly coloured chestnut (23) to purplish chestnut (21), or liver brown, often papillate; **gills** dull yellowish ochre; **stem** base reddish; **milk** white, acrid after a while, yellowing on a paper tissue after some time to chrome yellow. [Note: test on paper tissue, if yellow in < 5-17 minutes, count as yellow]; **spores** 7-8x6-7.5µm. **Habitat:** On acidic soil in woodland or on heathland, usually associated with *Pinus* spp, and rarely reported with *Picea* spp. **Occurrence:** Occasional but widespread.

**hysginus** FNE 80 **Cap** 5-7cm, rust (13) to dark brick (20), infundibuliform, viscid, to slimy, shiny, finely rugulose to radially veined; stem paler, inflated, hollow, sometimes spotted, cap diameter > stem height; **milk** white immediately very acrid and at the same time spicy; **smell** very distinct, aromatic like the larvae of *Cossus cossus* – a fruity resinous smell rather like candle wax; **spores** 7-7.5x5.5-6.5µm with warts and broad ridges up to 1 µm [separates this from other *Lactarius* species]. **Habitat:** on acid soils often associated with *Pinus* spp in mixed deciduous and conifer woodland. Occasionally reported with *Picea*, *Tsuga* and *Betula* spp. **Occurrence:** Rarely reported but apparently widespread.

**lacunarum** FNE198 is very like *L. tabidus* **Cap** 2-6cm smooth to finely rough, dry, usually with wrinkled umbo, margin not striate, rusty buff (13/52) to pale ochraceous (4); **gills** pale cinnamon ochre; **milk** abundant, white, slowly yellow on gills, flesh and on paper tissue; **spores** 7.5-9x6-7µm. **Habitat:** On soil in deciduous woodland, often in wet areas under *Alnus*, *Betula*, *Quercus* or *Salix* spp. Often collected from periodically flooded hollows or depressions in lake- or pond-side woodland, in ditches, wheel-ruts, or drainage channels, sometimes with *Sphagnum* moss. **Occurrence:** Occasional but apparently widespread. Many of the records are from Scotland and Northern Ireland, but it is also not uncommon in South Hampshire (New Forest).

**lanceolatus\*\*** FNE 180 **Cap** 2.5-5.5cm, smooth, dry to sticky or glossy, often becoming matt, margin often finely crenulate; and ± areolate-rimose in a concentric pattern; **gills** pinkish buff, later clay-pink to isabelline; **flesh** ± fragile, soon hollow in the stem; **smell** faint or like *L. quietus*; **taste** mild or becoming slightly bitter; **milk** white or watery white, unchanging, taste mild or slightly astringent; **spores** 7.2-11.3x5.6-8.4µm, ornamentation 0.3-0.9 µm high, of fine ± elongate warts, joined by fine lines and low ridges to form an incomplete reticulum. **Habitat:** On soil, associated with *Salix herbacea*. **Occurrence:** British collections only from Shetland (Foula) and Fair Isle in 1998.

**lilacinus** FNE 168 **Cap** 2-10cm, pinkish to brick red (76/15), sometimes dingy lilaceous grey (34/79), smooth to finely squamulose, un-zoned; **gills** dingy tan; **stem** becoming ± hollow, rather fragile; **milk** white to watery, sparse, taste bitter to slightly acrid after a little while; **smell** distinctly fruity or like *L. quietus*; **spores** 7.5-8x6-7.5µm with connectives forming a network; **Habitat**: On soil in wet woodland, along stream sides, drainage channels and by lakesides, always associated with *Alnus glutinosa*. **Occurrence**: Rarely reported but apparently widespread. A distinctive and often brightly coloured species, possibly genuinely rare in Britain

**luridus\*\*** FNE 84 **Cap** 2-7.5cm, smooth with finely pubescent margin, slightly sticky/greasy, not slimy, pallescent with age, clay-buff, greyish brown, umber or fawn, sometimes slightly zonate or with darker spots; **gills** crowded, anastomosing, pale cream to cream, staining dark ± violet; **stem** pale, whitish, greyish, even dark pinkish buff, staining violet when bruised, sometimes with watery spots; **flesh** firm, elastic, white, turning pale lilac to lilac after a few minutes; **smell** agreeable, slightly sweet; **taste** disagreeable, rancid to bitter; **milk** rather abundant, pale cream drying greyish purple and greyish on paper, not changing with KOH or when isolated from the flesh, taste mild then bitter; **spores** 7.8-11x6.4-9.6µm, ornamentation up to 1µm high. **Habitat**: British collections associated with *Betula* sp. and *Salix phylicifolia*. **Occurrence**: Reported only from Easternness (near Aviemore) and the Orkney Isles.

**mairei\*\*** FNE 164 **Cap** 2-10cm, margin distinctly shaggy-tomentose, pale rusty (13) cream (2), often zoned; **gills** whitish with flush of cap colour; **stem** concolorous; **flesh** rather soft, in older specimens hollow in the stem; **milk** mild at first, soon acrid to very acrid, white, unchanging; **smell** fragrant of pelargonium, fruity or like *L. quietus*; **spores** 7.5-9x6-7µm. **Habitat**: On soil (often calcareous) in deciduous woodland. Often associated with *Quercus* spp, but also reported with *Fagus*. **Occurrence**: This is a distinctive species, possibly genuinely rare though widespread in Britain. Known from England (Bedfordshire, Berkshire, Herefordshire, Hertfordshire, Oxfordshire, Surrey, West Kent and West Sussex) and a single collection from Scotland (Easternness).

**mammosus** FNE 172 **Cap** 4-8cm, dull, smooth or pruinose, with pointed umbo, grey brown (1/29) to vinaceous buff (31); **gills** ochre with an orange tint; **stem** ochre to cinnamon; **milk** white, often sparse, mild becoming hot to very hot after a short delay bitter to acrid; **smell** of coconut; **spores** 7.5-9x5-6µm. **Habitat**: On soil amongst needle litter in conifer woodland, or in litter with mixed conifers and deciduous trees. **Occurrence**: Rarely reported, but apparently widespread

**musteus** FNE 76 **Cap** 5-10cm, smooth, viscid becoming dry, pale ochre (8) to saffron (49), un-zoned but centre darker, stem with darker scrobicules; **gills** crowded, pale yellow with brown spots; **milk** mild, to slightly acrid after a while, white, drying pale cream, yellow on the gills; **smell** faintly fruity like *L. quietus*. Spores 7-8.5x5.5-7.5µm. **Habitat**: On soil in Caledonian pinewoods, usually in boggy areas, with or near *Sphagnum* spp, growing under *Pinus sylvestris* **Occurrence**: Rarely reported but rather frequent in Caledonian pine forests.

**obscuratus** FNE 206 **Cap** 1-3cm, smooth or sometimes radially wrinkled at the centre, sometimes umbonate, brown (17) to cinnamon (11) sometimes with an olivaceous (62) tinge at the centre; **gills** light buff; **stem** slender pale orange brown; **milk** white, mild, often sparse, sometimes slightly yellowing on a handkerchief; **smell** faint or sweetish; **spores** 8-9x6.5-µm. **Habitat**: On loam soils, associated with *Alnus* in wet woodland. **Occurrence**: Occasional but apparently widespread. Previously much confused with similar taxa.

[was *obnubilis* syn; *omphaliformis*, *cyathula*, *obscuratus*, *cyathuliformis*] but not so in FNE

**omphaliformis** FNE 212 **Cap** 0.8-2.2cm, dry, striate halfway to centre, with age becoming distinctly cracked and scaly in a concentric pattern towards the centre, yellowish brown, then becoming pale orange-brown to orange-brown, between striae, at margin pinkish buff, hygrophorous, drying greyish salmon to clay-buff with slightly darker centre; **gills** pinkish buff to salmon; **stem** at first brownish orange, then darkening to dark reddish brown, hairs at base brownish orange; **flesh** rather fragile, hollow in stem, very thin in cap; **taste** mild; **smell** insignificant; **milk** sparse, white; taste mild. Spores 6.9-9.6x5.5-7.8µm, ornamentation 0.7-1.2µm high. **Habitat:** On soil, associated with *Alnus* in wet woodland. **Occurrence:** Apparently widespread but previously much confused with similar taxa.

**pallidus** FNE 74 **Cap** 5-12cm, smooth, viscid to slimy shiny when dry (kiss test!) pale ochre (8) or buff to saffron (49), un-zoned but centre darker; **gills** crowded, pale yellow with brown spots, 13; **stem** pale; **milk** mild, white, sparse; **spores** 7.5-8.5x6-6.5µm. **Habitat:** On soil (often calcareous) in deciduous woodland, usually associated with *Fagus* but also reported with *Betula*, *Corylus* and *Quercus* spp. **Occurrence:** Occasional but widespread. May be locally frequent, but nowhere common.

**piperatus** FNE 248 **Cap** 8-20cm, smooth, white, margin smooth; **gills** white, crowded; **stem** white, cap diameter = or < stem height; **milk** very acrid (mild to slightly acrid), white, (if milk dries green see *L. glaucescens*), not yellow with KOH; **spores** 8-9x6-7µm. **Habitat:** On soil in mixed deciduous woodland, usually associated with *Fagus* and *Quercus* spp. **Occurrence:** Occasional but widespread. May be locally common, especially on rich loam soils in old woodland.

**pilatii** FNE 62 **Cap** 1.2-5.5cm, often umbonate, surface viscid, fuscous black to dark brick-coloured (20), fuscous, dark fawn, sepia or greyish brown, sometimes faintly zonate, pallescent from margin to fawn, clay-buff or pale mouse-grey, extreme margin sometimes pale cream; **gills** broadly medium crowded, sometimes forked, pale cream to cream, pinkish buff or dark pinkish buff with slightly paler margin, when bruised turning brownish olive; **stem** cylindrical or slightly broader near the base; surface slightly viscid, pale cream becoming dark greyish, pale salmon at the top; **flesh** rather fragile, whitish to pale pinkish buff or greyish buff, **taste** moderately acrid after a while; **smell** faint, acidic; **milk** white, drying olivaceous buff; taste immediately acrid and at the same time aromatic. Spores 6.5-8.6x5.4-6.9µm, ornamentation up to 0.8(-1) µm high. **Habitat:** Associated with *Betula*, mostly in bogs, often in *Sphagnum*. Found from July to September. **Occurrence:** Known from Fennoscandia, Scotland and the Czech Republic. [*Lactarius pilatii* is very closely related to *L. vietus*, but differs in having darker colours, a ± umbonate cap and slightly narrower spores.]

**porninsis\*\*** FNE 134 **Cap** 3-13cm radially fibrillose to felty, greasy to somewhat sticky, ochraceous orange (48/10) to yellowish brown, orange-brown or cinnamon, with concentric zones, palest near the margin; **gills**, crowded, pale pinkish buff to pinkish buff; **stem** tapering upwards and downwards, pale cream to cream or pale pinkish buff; **flesh** **taste** at first mild and agreeable, then bitter and disagreeable; **smell** agreeable, rather strong, fruity (fide Neuhoff and Marchand); **milk** white, unchanging; taste mild; **spores** 6.3-9.6x5.2-7.3µm, ornamentation up to 0.5 µm high. **Habitat:** on soil, in conifer woodland. British records associated with *Larix* spp in upland areas. **Occurrence:** First reported and collected from Easternness (Nethy Bridge) in 1982, and from Kingussie in 2004.

**pterosporus** FNE 230 **Cap** 4-10cm, dry, matt, strongly wrinkled towards the centre, buff (52) to smoke grey (34) to vinaceous buff (31), un-zoned, cap diameter < stem height; **stem** paler than cap; **gills** crowded cream to bright ochre; **flesh** firm, white soon changing to pale reddish rose, greyish in stem; smell sale somewhat 'pharmaceutical'; **milk** mild to bitter, milk turning red, only on contact with gills [Note: if gills reddening, but not the milk, go to *ruginosus*]; **spores** 7-8x5-7µm. with wings, up to 2.5 µm. **Habitat:** On soil (often calcareous) in deciduous woodland, usually associated with *Fagus* and less often *Carpinus*, *Corylus* or *Quercus* spp. **Occurrence:** Occasional in England (and not infrequent in southern counties). Rarely reported elsewhere but apparently widespread. Easily confused with similar taxa.

**pubescens** FNE 160 **Cap** 5-8cm, white, indistinctly zoned pink, tomentose, margin distinctly tomentose; **gills** crowded, decurrent, with pink flesh tinge, **flesh and gills** with pink tinge; **milk** very acrid, white and remains white; **spores** 6.5-8x5.5-6.5µm. **Habitat:** On neutral or calcareous soil, in woodland or in grassland, always associated with *Betula* spp. **Occurrence:** Common and widespread.

**pyrogalus** FNE 52 **Cap** 4-8cm, smooth or somewhat wrinkled towards the centre, slightly sticky when wet, shiny when dry (kiss test!), grey (34) buff (52) or olivaceous buff (63), not zoned or zoned with a few narrow darker zones near margin which is often irregular; **stem** pale; **gills** distant, ochraceous to bright ochre; **milk** abundant, immediately very hot, white, watery, drying green on gills; **spores** 6.5-7x5.5µm. **Habitat:** On loam soil in woodland, usually associated with *Corylus* and infrequently with *Carpinus*. **Occurrence:** Common and widespread.

**quieticolor** FNE 142 **Cap** 2.5-11cm, smooth viscid when wet, becoming dry with age, ± zonate especially towards the glabrous margin, colours very variable, pale greyish to ochraceous to pale purplish grey to rose grey to buff to pale brick (15), zoned, with darker scrobules in zones; **gills** crowded, orange; **stem** cylindrical or tapering down, dry often with a whitish zone below the gills, cap diameter > stem height; **flesh** blue, sometimes slowly, on cutting; **milk** mild, carrot; **spores** 7.5-9x6.5-8µm. **Habitat:** On acidic soil in conifer woodland, usually associated with *Pinus sylvestris*. **Occurrence:** Rarely reported. Known from England (East Sussex, South Hampshire and West Kent), Scotland (Morayshire and South Aberdeen) and Wales (Breconshire) and reported elsewhere but unsubstantiated with voucher material. Resembles *L. deliciosus* when the cobalt-blue colours of the cap have faded.

**quietus** FNE 192 **Cap** 2.5-8cm, dry, smooth, dull cinnamon (10) to brick at the centre, distinctly zoned with rings and spots the colour of the cap centre; **gills** crowded, whitish to pale cinnamon, **stem** concolorous or darker, **milk** white, mild, **smell** characteristic, said to be of bed bugs; **spores** 8-9x7-7.5µm. **Habitat:** On soil in deciduous woodland, associated with *Quercus* spp. **Occurrence:** Very common and widespread.

**repraesentaneus\*\*** FNE 104 **Cap** 6-20, bright yellow ochre, straw (50) to lemon yellow (54), slightly zoned, margin distinctly tomentose; **stem** ± concolorous with honey coloured pits, cap diameter = or < stem height; **gills** ± decurrent, rather crowded, often forked near stem, pale yellow; **milk** mild, then bitter, white turning violet when drying; **Spores** 9-11x7.5-9µm. **Habitat:** On acidic soil, associated with *Pinus sylvestris* and *Betula* spp. **Occurrence:** Rare, and virtually confined to Scotland. A single record, with voucher material, from England (Cumberland: Loweswater\* and reported from Wales (Caernarvonshire: Llyn Padarn) but unsubstantiated with voucher material.

**resimus\*\*** FNE 116 **Cap** 8-15cm, pruinose, white, firm, margin tomentose; **stem** white, short, cap diameter > stem height; **gills** white to pink, crowded; **flesh** hot, slowly yellow then brown, **milk** mild to acrid, scarce, white, yellow with KOH; **smell** fruity. [If gills distant, milk mild (flesh hot!) go to *L. vellereus*]; **spores** 7.5-10x5-7µm. **Habitat:** On soil, associated with *Betula* spp. **Occurrence:** British collections from Highland birchwoods. Records from England are unsubstantiated with voucher material.

**romagnesii\*\*** FNE 234 **Cap** 5.5-11cm, surface smooth, matt, dry, pruinose-velutinous, fuscous, concolorous or fawn (29) to clay-buff towards margin later becoming depressed to funnel-shaped, slightly wrinkled in the centre, margin sometimes becoming crenate or folded with age, typically remaining decurved; **gills**, distant, broad, rarely forked, cream to warm buff; **stem** cylindrical or tapering downwards, sometimes longitudinally grooved, at the top with furrows continuing from the gills, slightly darker when touched, at the base paler to whitish; **flesh** medium firm to firm, sometimes soft in the stem, whitish, slowly turning pinkish buff to salmon or flesh-pink, especially above the gills and near the stem surface; **taste** ± mild or becoming slightly bitter; **smell** faint, like *L. quietus* or shellfish; **milk**

white, rather sparse, taste mild; **spores** 7.3-9.8x6.3-8.3µm, globose to broadly ellipsoid, ornamentation of up to 2(-2.5) µm high ridges and irregular warts, ridges branched, forming a reticulate pattern. **Habitat:** On loam soil in mixed deciduous woodland, associated with *Corylus*, *Fagus* and *Quercus* spp. Accepted sensu FNE2, but not sensu FungEur7, Bon, or C&D (all of which represent a southern species, unknown in Britain). **Occurrence:** Recorded from southern England but poorly known in Britain. Some records of *Lactarius fuliginosus* may belong here.

**rostratus\*\*** FNE 216 **Cap** 0.8-3.5cm, dry, smooth, irregularly rugose to granulose all over, eventually ± radially wrinkled in the inner half often with a small persistent umbo or papilla, orange-brown to dark brick (20) when young, later turning brick to cinnamon or ochraceous orange, especially in the outer part, typically appearing ± marbled, margin often ± peach; **gills** crowded to rather crowded, sometimes forked, at first pinkish buff, later ochraceous to clay-pink, discolouring brick when broken; **stem** cylindric, ochraceous to brick, at the top pale salmon, soon turning fawn to orange-brown from the base; **smell** strong, like *L. quietus*, but stronger; **taste** mild, sweetish, becoming slightly nauseous; **milk** watery white, taste mild; **spores** 5.9-8.2x5.3-7.2µm; ornamentation 0.7-1.5µm high, of ± elongate warts and ridges, irregularly joined to form an often slightly zebra-like pattern. **Habitat:** On soil in mixed deciduous woodland. **Occurrence:** a single collection from West Sussex (Ebernoe Common) in 2001.

**rubrocinctus\*\*** FNE 202 **Cap** 5-12cm, smooth matt, dry sienna (11), un-zoned, lighter towards margin, becoming depressed with age; **stem** concolorous, with 2 mm reddish zone at apex, cap diameter = or > stem height; **gills** crowded, decurrent, ochre cream, becoming lilac or rusty brown on bruising; **smell** like *Lactarius quietus* or *Lepiota cristata* but fainter; **milk** white, unchanging, mild to slightly bitter/acrid at back of tongue; **spores** 7.5-10x5-7.5µm. **Habitat:** On soil in deciduous woodland, usually associated with *Fagus* and *Quercus* spp. **Occurrence:** Rarely reported. Most records are from southern England, with a few from Scotland.

[FNE2: is recognized by the rather robust habit in combination with the pallescent orange-brownish cap, which becomes radially wrinkled with age and when drying out. Also the dark 'collar' at top of the stem is often distinct.....There follows a long discussion about how the interpretation of this species is complicated.]

**rufus** FNE 176 **Cap** 4-10cm, dull pruinose surface, dark reddish brown, convex or plane, rusty tawny (14) or brick (15); **gills** fairly crowded, sometimes forked near stem, pale cream, sometimes with reddish tint; **stem** paler than cap with a whitish top and base; **flesh** taste at first mild, soon very hot and remaining so at back of tongue for several minutes; **milk** mild to burning acrid, very hot, after a while; **spores** 7-10x6-6.5µm. **Habitat:** On acidic soil with conifers such as *Abies*, *Picea* and *Pinus* spp, or mixtures of conifers and *Betula* spp, in native woodland, plantations or on heathland. Very rarely reported with *Fagus*. **Occurrence:** Common and widespread. *L. mollis* is maintained as distinct by some authorities.

**ruginosus\*\*** FNE 236 **Cap** 5-10cm, glabrous (smooth) or pruinose (minutely hairy) matt, dry, sepia, fawn (29) to milky coffee (28) or snuff brown (17), un-zoned, margin glabrous, scalloped; **gills** rather distant, pale ochre, stain red on bruising, **stem** pale, dirty white, **smell** musty, slightly spermatic; **milk** acrid, white slowly turning reddish in contact with the flesh, unchanging when isolated; **spores** 7-8.5x6.5-7.5µm with ornamentation up to 2µm high. **Habitat:** On soil in deciduous woodland, associated with *Carpinus*, *Fagus* and *Quercus* spp. **Occurrence:** Accepted with some doubt. The few British collections require re-examination, since some or all may be *L. romagnesii*

**salicis-reticulatae\*\*** FNE 98 [cf **aspideus**] **Cap** 2-5cm, surface irregular, very viscid with a decurved margin, sometimes papillate, colour cream to warm buff or buff-yellow, darker in the centre, itself sometimes tinged sulphur-yellow, margin straight, sometimes slightly crenulate; **gills**, distant (but often fairly crowded near the margin due to many shorter gills), pale cream to warm buff; **stem** cylindric or widened near the base; surface viscid, pale cream, to yellowish at the base; **flesh** white, changing to pale lilac, thin and fragile, but rather firm in the cap, becoming hollow in the stem; **smell** sweet, fruity or like *Pelargonium*; **taste** indistinct; **milk** mild, rather sparse, white, turning lilac on gills and flesh; **spores** 9.3-11.6x8.0-10.3µm, ornamentation of ridges and irregular warts, up to 0.3 µm. **Habitat:** On soil in unimproved grassland on limestone. Usually associated with dwarf *Salix* spp, but with *Dryas octopetala* in Britain. **Occurrence:** An arctic-alpine species, known from West Sutherland (Inchnadamph NNR).



**salmonicolor** FNE 138 **Cap** 8-20cm smooth, viscid when wet, orange (48) to brick (15), greening with age, zoned; **stem** pitted with elongate darker spots, cap diameter > stem height; **gills** medium crowded, sometimes forked or anastomosing, staining brownish vinaceous; **flesh** immediately orange, slowly orange brown to brownish vinaceous; **smell** agreeable, sweetish like mandarin oranges to disagreeable like clotted blood; **milk** carrot, slowly wine red, moderately abundant, mild and agreeable to bitter and disagreeable; **spores** 8-10x7-9µm. **Habitat:** On acidic soil in plantation woodland, associated with *Abies* spp. Also reported with *Picea* spp and *Taxus*. **Occurrence:** Rarely reported. Known from England (East Kent and West Sussex) and Scotland. Reported elsewhere in England, but unsubstantiated With voucher material

**scrobiculatus\*\*** FNE 106 **Cap** 6-20cm, vividly coloured, luteous (51) or straw (50), zoned, margin tomentose; **stem** with yellow scrobicules (blotches), thick, hard, cap diameter > stem height; **smell** strongly fruity-acidic; **milk** acrid, white turning yellow; **spores** 8-9.5x6-7.5µm. **Habitat:** On soil in woodland. Strictly associated with *Picea* spp. **Occurrence:** Accepted only on the strength of some old collections in herb. K, which are in poor condition. Reported on several further occasions from England and Scotland, but unsubstantiated with voucher material.

**semisanguifluus\*\*** FNE 148 **Cap** 5-15cm, viscid when wet, orange (48) to brick (15), greening with age, zoned; **gills** medium crowded to rather distant, orange with green spots, with vinaceous tinge; **stem** with wine coloured scrobicules, cap diameter > stem height; **flesh** orange to reddish orange, discolouring to dark vinaceous; **taste** like carrots becoming slightly bitter; **milk** mild to bitter, wine red from the outset; **spores** 8-10x7-9µm. **Habitat:** On soil in woodland, associated with *Pinus* spp. Several collections from cemeteries **Occurrence:** Known from England (Middlesex, East Sussex, Leicestershire, and Surrey) and Northern Ireland (Fermanagh).

**serifluus** FNE 220 **Cap** 2.5-5cm, smooth to somewhat radially rugose around centre, dry ± depressed to funnel-shaped, with a small umbo, margin often becoming somewhat flexuose; orange-brown to reddish brown, towards margin yellowish brown; **gills** medium crowded, very few forked, salmon to clay-pink, edge paler and more yellowish; **stem** often tapering towards base, surface soon ±smooth, salmon to clay-pink, discolouring to ochraceous orange or orange-brown from base; **flesh** pinkish-buff; **taste** mild, aromatic; **smell** strongly aromatic, nauseous, ± like *L. quietus*; **milk** rather sparse, watery white, taste mild; **spores** 6.4-8.8x5.8-7.9µm, ornamentation 0.7-1.2 µm high. **Habitat:** On soil (often clay) in woodland, usually associated with *Quercus* spp. Also known from fen-carr habitat, with *Alnus* and *Fraxinus* **Occurrence:** Widely reported but poorly understood in Britain. Frequently confused with *Lactarius suburnbonatus*

**sphagnetii** FNE 186 **Cap** 3-5cm, somewhat two-coloured, dark red brown, centre almost black, often yellowish brown to clay pink at the margin; **gills** crowded, white to ochre; **stem** paler than cap; **milk** white unchanging, mild; **spores** 8-9.5x6.5-8µm. **Habitat:** In Caledonian pinewoods, usually in wet or boggy areas amongst *Sphagnum* spp, growing under *Pinus sylvestris* **Occurrence:** Rarely reported. In Britain, strictly associated with *Pinus sylvestris* In continental Europe known only with native *Picea* spp, so two taxa may be involved.

**spinosulus** FNE 166 **Cap** 2 - 6cm, tomentose, indistinctly zoned, lilac, dingy lilaceous grey (34/79); **stem** paler; **gills** moderately crowded cream to pinkish buff, often forked; **flesh** pale, taste mild to slightly bitter; **milk** white to watery, sparse, taste mild to slowly bitter to acrid; **spore print** pinkish; **spores** 7.5-8.5x5.5-6.5µm. **Habitat:** On soil in woodland, usually associated with *Betula* spp. Also reported with *Alnus*, *Corylus* and *Fagus*. **Occurrence:** Rarely reported but apparently widespread. Seemingly most frequent in Scotland but often confused with *L. lilacinus* and most records are unsubstantiated with voucher material.

**subdulcis** FNE 194 **Cap** 3-7cm, smooth to rugulose, dark brick to pale fulvous (12); **gills** white then ochraceous; **stem** paler than cap; **smell** faint, like old rubber tyres or like *Lepiota cristata*; **milk** abundant white, taste mild becoming very slightly bitter; **spores** 7-8x8-6µm. **Habitat:** On soil in deciduous woodland, usually associated with *Fagus* but also commonly reported with *Betula* and *Quercus* spp. **Occurrence:** Very common and widespread

**subumbonatus** FNE 222 **Cap** 2-6cm, not zoned, dark brown, umber (18) to cigar brown (16) to almost black, margin lobed, irregular; **gills** crowded, brownish yellow; **stem** concolorous; **smell** strong aromatic-nauseous, oily; **milk** watery with clouds, like whey; **spores** 7.5-9x7-8µm. **Habitat:** On soil in deciduous woodland, usually associated with *Quercus* spp. **Occurrence:** Apparently common in England and Northern Ireland, but rarely reported elsewhere. Often confused with similar taxa.  
[syn: *cimicarius*, *serifluus*]

**tabidus** FNE 200 **Cap** 1.3-4(-5.5)cm, smooth, becoming radially wrinkled with age and when dried out, slightly greasy to dry, convex to applanate, later depressed to funnel-shaped, often with a small and ± persistent umbo; cinnamon, yellowish brown, brick or orange-brown, and with age paler to saffron, ochraceous or ochraceous orange, ± hygrophanous; **gills** fairly crowded, sometimes forked, cream to salmon, often with small, yellowish brown to fawn spots; **stem**, cylindric to clavate; surface smooth, dry, palest at apex, with age darkening from base to fawn, brick or dark brick; **flesh** fragile, soft or hollow in stem, pale cream to dark pinkish, turning pale yellow after a few minutes; **taste** mild to slightly astringent or acrid; **smell** faint like *L. quietus*; **milk** rather abundant, white, slowly turning straw-yellow to pale yellow, taste mild, then slightly bitter or acrid; **spores** 6.0-8.6x5.2-7.1µm. ornamentation 0.6-1.2(-1.5)µm high. **Habitat:** On soil in deciduous woodland, most often reported with *Betula*, *Fagus* and *Quercus* spp. **Occurrence:** Very . common and widespread.

**torminosus** FNE 156 **Cap** 5-15cm, tomentose, margin tomentose, robust, distinctly zoned, flesh pink in colour (pale 30/76), to brick with darker pink to orange-brown zones; **gills** crowded, decurrent, pale pink; **stem** cylindric to subclavate, surface dry, soft, slightly pruinose, sometimes with some ochraceous orange or dirty green spots or pits, cap diameter = or > stem height; **flesh** white, taste very acrid after a few minutes; **milk** abundant, acrid, white, unchanging, taste almost immediately very hot; **spores** 7.5-10x6-8µm **Habitat:** On soil in deciduous woodland, always associated with *Betula* spp. **Occurrence:** Common and widespread.

**trivialis\*\*** FNE 70 **Cap** 5-15 cm, large, robust species, violet grey to pale purple pink, leather, yellow, vinaceous grey (80), un-zoned; **gills** decurrent, whitish; **stem** white, swollen, barrel-shaped, hollow; **milk** very acrid, white turning greenish grey; **spores** 8.5-10.5x7-8.5µm. **Habitat:** Montane, on acidic soil in woodland. British material is usually said to be associated with *Betula* spp, but these are often intermixed with conifers such as *Pinus* or *Picea* spp **Occurrence:** British collections only from Scotland. Records from elsewhere are unsubstantiated with voucher material. In continental Europe this is a submontane species associated with *Picea* spp in native woodland.

**turpis** FNE 42 **Cap** 8-15cm, slightly viscid towards the centre, finely velvety to innately hairy, dark, olivaceous (62) to umber (18) or green tinges, margin tomentose at first; **gills** crowded, dirty greenish white; **stem** stout, concolorous, cap diameter > stem height; **milk** acrid, white turning violet, drying greenish yellow; **spores** 7x5.5-6µm. **Habitat:** On soil in woodland or on heathland. Usually associated with *Betula* spp, but also known with conifers such as *Picea* and *Larix* spp **Occurrence:** Very common and widespread.  
[Nomenclature follows Basso (FungEur7). English name = 'Ugly Milk Cap'. was *necator* and *plumbeus*]

**uvidus\*\*** FNE 82 **Cap** 4-8 cm, smooth, viscid to glutinous, violaceous grey with dark stains, pale vinaceous to violaceous grey (75), un-zoned, margin glabrous; **gills** cream, crowded, violet when bruised; **stem** pale, hollow; **milk** mild, white turning violet; **spores** 9-10.5x7.5-8.5µm. **Habitat:** On soil, often in wet areas in deciduous woodland. Usually associated with *Betula* spp, but also reported with *Alnus*, *Corylus*, *Quercus* and *Salix*spp in similar habitats. **Occurrence:** Occasional in Scotland. Rarely reported elsewhere but apparently widespread.  
[If cap < 4cm and under *Betula nana* in sub-alpine areas: *pseudouvidus*]

**vellereus** FNE 252 **Cap** 10-25cm, surface velvety, margin tomentose, pruinose, white, very firm; **gills** narrow to medium broad, distant, rather thick and often forked, whitish chrome to pale cream, becoming clay-buff to dark brick coloured when old; **stem** white, short cap diameter > stem height; **flesh** solid, firm, slowly yellow then brown, taste soon very acrid; **milk** mild when isolated from the flesh, otherwise slightly bitter (flesh hot!), not changing with KOH; **spores** 9-12x7.5-10µm. **Habitat:** On soil in woodland, usually associated with *Betula*, *Corylus*, *Fagus* and *Quercus* spp. **Occurrence:** Occasional but widespread. May be locally common, especially in old deciduous woodland

**vellereus var. hometii\*\*** **Milk** dries pink on gills. **Habitat:** On soil in deciduous woodland. British collection associated with *Betula* sp. **Occurrence:** A single collection, from East Sussex (Abbots Wood) in 2004. Two other records from Herefordshire are unsubstantiated with voucher material.

**vietus** FNE 58 **Cap** 3-8cm, viscid when wet, silky when dry, applanate to depressed, even funnel-shaped with decurved, smooth edge, pale greyish colours, pale vinaceous grey (80), lilaceous or pinkish grey; **gills** crowded, decurrent, dirty white staining grey; **stem** paler, grey above to ochre below; **milk** acrid, white turning grey on drying; **spores** 9-10x6.5-7.5µm. **Habitat:** On soil or amongst *Sphagnum* spp in woodland, often in wet areas under *Betula* spp. **Occurrence:** Common and widespread

**violascens\*\*** FNE 86 **Cap** 9-10cm, smooth or finely wrinkled, viscid, vinaceous grey (80) to purplish date (22), zoned with oily spots; **gills** crowded, pale ochre, turning vinaceous purple to slate purple when bruised; **stem** pale; **milk** mild, white turning pinkish lavender; **spores** 8-11x7-8µm. **Habitat:** On soil in deciduous woodland, usually reported with *Betula* and *Quercus* spp, and rarely with *Fagus*. **Occurrence:** Known from Scotland. Recorded from western England (Herefordshire and Shropshire), Wales, and Northern Ireland but unsubstantiated with voucher material.

**volemus** FNE 246 **Cap** 8-15 cm, smooth, dry finely cracked when dry, tomentose, margin pale, wrinkled, apricot, bright orange (48) to sienna (11), un-zoned; **stem** pale, solid; **gills** whitish, pale cream to cream, bruising rusty; **flesh** very firm, pale cream to cream turning brownish; **taste** mild and delicious like artichokes, turning green with FeSO<sub>4</sub>; **smell** of herrings, shellfish or artichokes; **milk** abundant, mild, white, staining ± brownish; **spores** 7.5-9x8-10µm. In coniferous and deciduous forests but, mainly under oak and hazel. **Habitat:** On soil in deciduous woodland. Usually reported with *Betula*, *Fagus* or *Quercus* spp. **Occurrence:** Apparently widespread but rarely reported in recent years and possibly a declining species in the British Isles.

**zonarius\*\*** FNE 130 **Cap** 5-10cm, surface smooth, with tomentose margin when young, shiny, sticky, with abundant zones convex to applanate with a decurved margin, often slightly irregular and asymmetrical, becoming depressed or funnel-shaped with age; pale cream to pale pinkish buff, zones ochraceous to cinnamon; **gills** medium crowded, not veined, sometimes forked near the stem or undulate near the margin, whitish to pale cream or cream, ± brownish after bruising; **stem** cylindrical to ± clavate; surface smooth, dry or slightly viscid, concolorous, often with some darker pits or dots; **flesh** firm and elastic, whitish to pale cream, slowly changing to pale salmon or ± pinkish when cut, finally becoming greyish; **smell** sweet, fruity and slightly spermatic; **taste** mild at first, then burning acrid; **milk** rather abundant, white, unchanging, taste becoming acrid; **spores** 6.3-9.2 x 5.1-7.4 µm, ornamentation up to 0.75(-1.0) µm high. **Habitat:** On soil in deciduous woodland, associated with *Quercus* spp. **Occurrence:** Rarely reported and possibly genuinely rare. All but the most recent records are likely to be sensu NCL or Phillips (Ph) (= *L. evosmus*).

## SOURCES OF DESCRIPTIONS FOR LACTARIUS SPECIES

To get a full description of a species you will almost invariably have to consult more than one reference text. Many British species are in Roger Phillips "Mushrooms" (Ph), Marcel Bon's "The Mushrooms and Toadstools of Britain and North West Europe" (MB) has fewer species, some doubtful names, but does have useful drawings of the spores, Andre Marchand's "Champignons du Nord et du Midi" (AM) has comprehensive descriptions, but these are split between two parts of the book, with the spore drawings grouped separately at the end. *Lactarius* is split between volumes 1, 2 and 6. It is nonetheless an invaluable source book. Regis Courtecuisse's Collins Guide (RC) is the best field guide but has no spore diagrams. The British Fungus Flora volume 9: *Lactarius* (BFF9) includes some species not recognized in the *Checklist of British and Irish Basidiomycota* (CBIB). *The Fungi of Switzerland* volume 6 (Swiss 6) includes many of the British species with colour photographs and details of microscopic findings and chemical tests. The numbers in the body of the table below give you the page reference (or in RC the species number). A blank means that the species is not described in that book.

### Published **British** Species

| SPECIES                  | AUTHOR              | Ph | MB | AM  | RC   | BFF9 | Swiss 6 |
|--------------------------|---------------------|----|----|-----|------|------|---------|
| acerrimus                | Britz               | 58 | 82 | 515 | 1527 | 51   | 42      |
| acris                    | (Bolton:Fr.) Gray   |    |    | 564 | 1600 |      | 42      |
| aspideus                 | (Fr) Fr.            |    | 86 | 527 | 1562 | 58   |         |
| aurantiacus              | (Pers.) Gray        | 59 | 90 | 560 | 1576 | 85   | 46      |
| azonites                 | (Bull.) Fr.         | 61 |    |     |      | 26   | 46      |
| bertillonii              | (Z. Schaeef.) Bon   |    |    |     |      |      | 48      |
| blennius                 | (Fr.) Fr.           | 57 | 96 |     | 1602 | 76   | 50      |
| camphoratus              | (Bull.) Fr.         | 63 | 98 | 572 | 1586 | 114  | 52      |
| chrysorrheus             | Fr.                 | 66 | 92 | 552 | 1579 | 53   | 54      |
| circellatus              | Fr.                 | 56 | 84 | 537 | 1540 | 72   | 54      |
| citriolens               | Pouzar              | 66 |    | 512 | 1518 | 55   |         |
| controversus             | Pers.               | 48 | 94 | 504 | 1512 | 46   | 56      |
| cyathuliformis           | Bon                 |    | 98 |     | 1606 |      |         |
| decipiens                | Quél.               | 61 | 92 | 553 | 1580 | 102  | 56      |
| deliciosus               | (L.)Gray            | 64 | 80 | 51  | 1551 | 32   | 58      |
| deterimus                | Grüger              | 64 |    | 524 | 1556 | 36   | 58      |
| evosmus                  | Kühner & Romagn.    | 50 |    | 516 | 1528 | 49   | 60      |
| flavidus                 | Boud.               | 61 | 86 | 526 | 1561 | 59   | 62      |
| flexuosus                | (Pers.) Gray        |    | 84 | 536 | 1539 | 74   | 62      |
| flexuosus                | (H. Post) Britzelm. |    |    |     |      |      |         |
| <i>var. roseozonatus</i> |                     |    |    |     |      |      |         |
| fluens                   | Boud.               | 52 | 86 | 540 | 1543 | 77   | 50      |
| fuliginosus              | (Fr.) Fr.           | 60 | 96 | 565 | 1601 | 27   | 64      |
| fulvissimus              | Romagn.             | 63 | 90 |     | 1578 | 27   | 64      |
| glaucescens              | Crossl.             |    | 94 | 503 | 1511 | 19   | 66      |
| glyciosmus               | (Fr.) Fr.           | 59 | 88 | 549 | 1573 | 79   | 66      |
| helvus                   | (Fr.) Fr..          | 63 | 88 | 546 | 1571 |      | 68      |
| hepaticus                | Plowr.              | 56 | 92 | 582 | 1597 | 100  | 68      |
| hysginus                 | (Fr.) Fr.           | 59 | 84 | 535 | 1537 | 69   | 70      |
| lacunarum                | Hora                |    | 92 | 580 | 1595 | 103  | 72      |
| lanceolatus              | O.K. Mill & Laursen |    |    |     |      | 86   |         |

| SPECIES                                 | AUTHOR                                   | Ph | MB  | AM  | RC   | BFF9 | Swiss 6 |
|---|--|----|-----|-----|------|------|---------|
| <i>lilacinus</i>                        | Lasch                                    |    |     | 550 | 1574 | 73   | 76      |
| <i>luridus</i>                          | (Pers.) Gray                             |    |     |     |      |      | 78      |
| <i>mairei</i>                           | Malençon                                 | 51 | 82  | 510 | 1526 | 44   |         |
| <i>mammosus</i>                         | Fr.                                      | 54 | 88  | 548 |      | 80   | 80      |
| <i>musteus</i>                          | Fr.                                      | 50 | 84  | 533 | 1535 | 67   | 80      |
| <i>obscuratus</i>                       | Lasch Fr.                                | 52 | 98  | 583 | 1607 |      | 82      |
| <i>omphaliformis</i>                    | Romagn.                                  | 54 |     |     |      |      | 84      |
| <i>pallidus</i>                         | Pers.                                    | 5  | 84  | 534 |      |      |         |
| <i>pilatii</i> (1)                      | Z. Schaef.                               |    |     |     |      |      |         |
| <i>piperatus</i>                        | (L.) Pers.                               | 48 | 94  | 501 | 1509 | 18   | 86      |
| <i>porninsis</i>                        | Rolland                                  |    |     |     |      | 52   |         |
| <i>pterosporus</i>                      | Romagn.                                  | 61 | 96  | 562 | 1598 | 30   | 90      |
| <i>pubescens</i>                        | (Fr.) Fr.                                | 50 | 104 | 508 | 1523 | 42   | 90      |
| <i>pyrogalus</i>                        | (Bull.) Fr.                              | 58 | 84  | 532 | 1532 | 71   | 92      |
| <i>quieticolor</i>                      | Romagn.                                  | 66 | 80  |     | 1553 | 33   | 92      |
| <i>quietus</i>                          | (Fr.) Fr.                                | 56 | 90  | 556 | 1581 | 98   | 94      |
| <i>repraesentaneus</i>                  | Britzelm.                                |    | 86  | 525 | 1558 | 62   | 94      |
| <i>resimus</i>                          | (Fr.) Fr.                                |    | 82  | 511 | 1517 | 57   | 96      |
| <i>romagnesii</i>                       | Bon                                      |    |     |     |      |      | 96      |
| <i>rostratus</i>                        | Heilm.-Claus.                            |    |     |     |      | 115  |         |
| <i>rubrocinctus</i>                     | Fr.                                      |    | 90  | 570 | 1585 | 109  | 98      |
| <i>rufus</i>                            | (Scop.) Fr.                              | 54 | 88  | 545 | 1569 | 87   | 98      |
| <i>ruginosus</i>                        | Romagn                                   |    | 96  | 563 | 1599 | 29   |         |
| <i>salicis-reticulatae</i>              | Kühner                                   |    |     |     |      |      | 100     |
| <i>salmonicolor</i>                     | (R. Heim & Leclair) R.<br>Heim & Leclair | 65 | 80  | 52  | 1557 | 39   | 102     |
| <i>scoticus</i>                         | Berk. & Broome                           |    |     |     |      |      | 104     |
| <i>scrobiculatus</i>                    | (Scop.) Fr.                              |    | 82  | 513 | 1520 |      | 104     |
| <i>semisanguifluus</i>                  | R. Heim & Leclair                        | 64 | 80  | 53  | 1549 | 38   | 106     |
| <i>serifluus</i>                        | (DC.)                                    | 63 |     |     |      |      | 106     |
| <i>sphagneti</i>                        | (Fr.)                                    |    | 98  | 554 | 1580 | 95   | 108     |
| <i>spinosulus</i>                       | Quél.                                    | 54 | 88  | 551 | 1575 | 92   | 108     |
| <i>subdulcis</i>                        | (Pers.) Gray                             | 54 | 90  | 557 | 1582 | 97   | 110     |
| <i>subumbonatus</i>                     | Lindgr.                                  |    | 98  | 577 | 1589 | 112  |         |
| <i>tabidus</i>                          | Fr.                                      | 60 | 92  | 578 | 1593 | 117  | 112     |
| <i>torminosus</i>                       | (Schaeff. ) Pers.                        | 51 | 82  | 54  | 1522 | 41   | 112     |
| <i>trivialis</i>                        | (Fr.) Fr.                                |    | 84  | 544 | 1547 | 64   | 114     |
| <i>turpis</i>                           | (Weinm.) Fr.                             | 57 | 86  | 538 | 1541 | 83   | 116     |
| <i>uvidus</i>                           | (Fr.) Fr.                                | 52 | 86  | 530 | 1566 | 61   | 116     |
| <i>vellereus</i>                        | (Fr.) Fr.                                | 48 | 94  | 505 | 1513 | 21   | 118     |
| <i>vellereus var.</i><br><i>hometii</i> | (Gillet) Boud.                           |    |     |     |      |      |         |
| <i>vietus</i>                           | (Fr.) Fr.                                | 52 | 86  | 539 | 1542 | 82   | 118     |
| <i>violascens</i>                       | (J. Otto) Fr.                            |    | 86  | 528 | 1564 |      | 120     |
| <i>volemus</i>                          | (Fr.) Fr.                                | 54 | 94  | 147 | 1583 | 23   |         |
| <i>zonarius</i>                         | (Bull.) Fr.                              | 59 | 82  | 515 | 1527 |      | 122     |

(1) "A DNA comparison of material collected in Scotland with Scandinavian material confirms the presence of this fungus in Britain, it remains to be seen if this really is a good species."