

**PROVISIONAL KEY TO AMANITA STIRPS CROCEA,
AMANITA STIRPS FULVA, AND AMANITA STIRPS ROMAGNESIANA**

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The key covers those taxa in *Amanita* section *Vaginatae* that share the following characters: Universal veil membranous and firm, lacking inflated cells that darken with age; stipe always exannulate from beginning of basidiocarp expansion; basidiocarp not having the combination of a large fruiting body with a proportionately large, fleshy volval sac and occasional to common basidial clamps; suprapellis not comprising a gelatinous matrix including narrow, loosely curving, filamentous, undifferentiated hyphae; subhymenium neither ramose nor pseudoparenchymatous, with many basidia arising from partially inflated or uninflated hyphal segments, but also commonly arising from inflated cells; lamella trama having many rather large globose to subglobose to ovoid to ellipsoid cells in subhymenial base; basidial clamps absent. The key is based on use of the microscope in examining several tissues if one is working with unannotated or poorly annotated unknown exsiccata. In the field, geographical location and the macroscopic characters provided should be helpful in determining material. For meaning of symbols, see Tulloss (1993, 1994, 1998b, 2000b) and Tulloss, Ovrebo and Halling (1992).

1. Subhymenial base dominated by elongate, curved, intercalary inflated cells; pileus a shade of, or with a tint of, yellow or orange; upper stipe lacking a white floccose sheath; 95% of spores < 12.0 μm long. [**Stirps Crocea**]
2. Pileipellis divided into distinct suprapellis and subpellis—at least once plentiful spores are present on the hymenium; pileus *Buff Yellow*, rather pallid except for disc or occasionally with irregular darker areas beyond disc; lamella edge having plentiful strands of interweaving hyphae visible in side view and only scattered deciduous inflated cells; acrophysalides in stipe context < 160 μm long; spores (8.4-) 9.0 - 12.6 (-17.6) \times (7.4-) 8.0 - 10.6 (-14.1) μm , with **Q** = 1.12 - 1.20; described from Sweden under *Betula* in deciduous forest; material also examined from *Betula* association in Norway.....
Amanita flavescens (E. J. Gilbert & S. Lund.) Contu
2. Pileipellis often lacking distinct suprapellis and subpellis—with hyphae gelatinizing only at surface; pileus yellow-orange to rather pale pure orange; lamella sometimes having extensive layer of deciduous inflated cells on edge; acrophysalides in stipe context with maximum length > 290 μm .
3. Pileus yellow-orange; stipe with pale orange decoration (*e.g.*, floccose-pulverulent, zigzagged bands) or with pale orange ground and densely set with upward pointing, narrow, fibrillose squamules (at first paler than ground, but becoming darker orange than ground at least on tips); spores (8.0-) 9.4 - 11.8 (-18.8) \times (7.5-) 8.5 - 11.0 (-16.0) μm , with **Q** = 1.07 - 1.10 (-1.11); described from France [material examined from Belgium, the Czech Republic, Germany,

the Netherlands, Sweden, and the U.K. in association with *Alnus*, *Betula*, *Carpinus*, *Corylus*, *Fraxinus*, *Picea*, *Populus*, or *Quercus*]
Amanita crocea (Quél. in Bourd.) Singer

3. Pileus pale pure orange or with more yellow tint; stipe white or very pale, lacking contrasting fibrillose decoration; spores (6.2-) 8.9 - 12.2 (-18.1) × (5.5-) 7.5 - 10.5 (-13.2) μm, with **Q** = 1.12 - 1.16 (-1.22); described from France from deciduous forest; additional material examined from France and Italy in association with *Fagus*, *Picea*, or *Quercus*.....

Amanita subnudipes (Romagn.) Tulloss
≡ *Amanita crocea* var. *subnudipes* Romagn.

1. Subhymenial base a combination of common to plentiful filamentous, undifferentiated hyphae and common, rather broad (e.g., ovoid or ellipsoid) inflated cells.

4. Pileus marginal striations usually ≤ 0.2R; pileipellis up to 250 μm thick; 95% of specimens with **Q** ≥ 1.12. [**Stirps Romagnesiana**]

5. Pileus bright orange-tawny to brownish orange; saccate volva white; pileipellis fully gelatinized only at surface; spores (8.0-) 9.4 - 12.8 (-21) × (7.2-) 7.9 - 11.4 (-17.0) μm, with **Q** = (1.10-) 1.12 - 1.20; described from France from deciduous forest or mixed forest including *Picea abies* L.; additional material examined from Belgium and Germany.....

Amanita romagnesiana Tulloss
≡ *Amanita crocea* var. *aurantiofulva* (E. J. Gilbert) Romagn.

5. Pileus dark brown to brown-black; saccate volva dirty white with plentiful pale leather-colored to orange-leather-colored spots; pileipellis having two-thirds or more of thickness as gelatinized to partially gelatinized suprapellis; spores (10.0-) 10.5 - 13.0 (-14.0) × (9.0-) 9.5 - 12.0 (-12.5) μm, with **Q** = 1.13; described from SW China from mixed forest including *Abies* and *Quercus* [Data cited here are from the protologue.].....

Amanita brunneofuliginea Zhu L. Yang

4. Pileus marginal striations usually > 0.2R; pileipellis < 100 μm thick; 95% of specimens with **Q** ≤ 1.12. [**Stirps Fulva**]

6. Pileus usually fulvous, sometimes pallid, sometimes fuscous over disc; pileipellis 55 - 80 μm thick, apparently lacking vascular hyphae; w_{cs} = 85 - 90 μm; w_{st-far} = 90 - 95 μm; spores (9.0-) 10.0 - 12.5 (-19.3) × (8.2-) 9.3 - 12.0 (-15.5) μm, with **Q** = 1.05 - 1.08 (-1.09); described from Bavaria, Germany; material examined from Germany, Norway, Sweden, Switzerland, and U.K. in association with *Betula*, *Fagus*, *Picea*, *Pinus*, and *Quercus*.....

Amanita fulva (Schaeff.) Fr.

6. Pileus usually dark brown to dark fulvous, often fuscous to nearly black over disc, at times paler or fulvous toward margin or (infrequently) overall; pileipellis 20 - 40 (-65?) μm thick, with locally common vascular hyphae; w_{cs} = 25 - 55 μm; w_{st-far} = 25 - 50 μm; spores (7.5-) 9.0 - 12.0 (-15.5) × (6.5-) 8.4 - 11.2

(-15.0) μm , with **Q** = (1.05-) 1.06 - 1.12 (-1.15); described from Andean Colombia with *Quercus humboldtii*; range extending north with *Quercus* at least to Honduras (additional material examined from Costa Rica and Honduras)...

Amanita fuligineodisca Tulloss, Ovrebo & Halling