

- **Tracer 1.6.0:** MCMC Trace Analysis Tool – Andrew Rambaut, Marc A. Suchard, Walter Xie and Alexei J. Drummond (2003–2013)
- **TreeBASE:** Piel et al. (2009), Vos et al. (2012)
- **Treegraph 2.14.0-771 beta:** Stöver and Müller (2010)
- **Tubulin Beta Chain – SMTL ID 5fnv:** Yang et al. (2016)
- **Two Parameter Model & Acquisition Bias Correction:** Lewis (2001)
- **Unite:** Kõljalg et al. (2013)

Acknowledgments We are thankful for the information, photographs (also in Supplement S2), fresh or dry material and friendly help from “Abeja”, Claudio Angelini, Ditte Bandini, Michael Beeckmann, Hans Bender, Konstanze Bensch, Julian Branscombe, Micheline Broussal, Klaus Büchler, Emanuele Campo, David Dandria, Daniel Deschuyteneer, Matthias Dondl, Giuliano Ferisin, Gernot Friebe, Andreas Gminder, Pérez-De-Gregorio, Anton Hausknecht, Norbert Heine, Michel Heykoop, Shah Hussain, Alexander Karisch, Amandeep Kaur, Lothar Kreuer, Lothar Krieglsteiner, Irmgard Krisai-Greilhuber, Steffen Lorenz, Regina Lüdecke, Rudi Markones, Jürgen Marqua, Antonio Ruiz Mateo, Andgelo Mombert, Gabriel Moreno, Bernd Mühler, Guillermo Muñoz, Andrea Oppolzer, Leif Örstadius, Shaun Pennycook, Marcus Rave, Matthias Reul, Torsten Richter, Antonio Ruiz, Carmel Sammut, Pablo Schäfer, Robert Schaike, M. Schönfeld, Wolfgang Schöbner, Rika Seibert, Karl Soop, Muhammad Usman, Andreas Vesper, Heidrun Wawrok, Karl Wehr, Gerhard Wührleitner, Jun-Qing Yan, Rainer Ziebart, Helmut Zitzmann and Stefan Zinke. Thankfully, Pablo Alvarado performed several sequencing sessions. We are grateful for the support for program-specific problems by Kazutaka Katoh, Ari Löytynoja, Bernd Kretschmer, Rob Lanfear, Anders Larsson, Mark Miller, Sonja J. Prohaska, Alexandros Stamatakis and Ben Stöver.

Special thanks to Matthias Reul for the comprehensive help with the translation.

Appendix. Preliminary key to the genera

Below, the design of a key based on the natural system is shown. The characteristics are often not restricted to one genus. Sometimes there are overlaps with features of other genera. For the determination of the species, a key based on distinctive features, regardless of the system would be more appropriate.

- | | | |
|----|---|----------------------|
| 1 | Pileipellis a cutis | <i>Coprinopsis</i> |
| 1* | Pileipellis a hymeniderm | 2 |
| 2 | (1) Pileus surface totally naked | 3 |
| 2* | Pileus surface not totally naked; veil, pileocystidia, setae or hairs present | 4 |
| 3 | (1) Pleurocystidia thick-walled, spores pale and ellipsoid | <i>Homophron</i> |
| 3* | Pleurocystidia thin-walled, spores dark and lentiform | <i>Parasola p.p.</i> |
| 4 | (2) Veil always absent | 5 |
| 4* | Veil always present, but sometimes fugacious | 6 |

- | | | |
|-----|---|--|
| 5 | (4) Pileipellis with long brown hairs, no other elements present | <i>Parasola p.p.</i> |
| 5* | Pileipellis without such hairs, but pileocystidia or setae may be present | <i>Tulosesus p.p.</i> |
| 6 | (4) Veil not wipeable | 7 |
| 6* | Veil wipeable | 8 |
| 7 | (6) Spores warty | <i>Lacrymaria</i> |
| 7* | Spores not warty | <i>Cystoagaricus</i> |
| 8 | (6) Veil consisting at least partially of spherical cells ... | 9 |
| 8* | Veil without spherical cells | 15 |
| 9 | (8) Pileocystidia present | 10 |
| 9* | Pileocystidia absent | 13 |
| 10 | (9) Pileus with greenish tones | <i>Punjabia</i> |
| 10* | Pileus without greenish tones | 11 |
| 11 | (10) Spores rounded-angular | <i>Tulosesus p.p.</i> |
| 11* | Spores otherwise | 12 |
| 12 | (11) Pileus plicate or furrowed | <i>Coprinellus p.p.</i> |
| 12* | Pileus at most translucent striated |
<i>Psathyrella sect. Cystopsathyra p.p.</i> |
| 13 | (9) Spores strongly flattened, outline tri- to polygonal | <i>Narcissea</i> |
| 13* | Spores otherwise | 14 |
| 14 | (13) Pileus plicate or furrowed | <i>Coprinellus p.p.</i> |
| 14* | Pileus at most translucent striated |
<i>Psathyrella sect. Cystopsathyra p.p.</i> |
| 15 | (8) Pileus plicate or furrowed | 16 |
| 15* | Pileus at most translucent striated | 17 |
| 16 | (15) Pileocystidia present | <i>Tulosesus p.p.</i> |
| 16* | Pileocystidia absent | <i>Hausknechtia</i> |
| 17 | (15) Pleurocystidia absent | <i>Candolleomyces</i> |
| 17* | Pleurocystidia present | 18 |
| 18 | (17) Pleurocystidia with large, refractive globules | <i>Typhrasa</i> |
| 18* | Pleurocystidia otherwise | 19 |
| 19 | (18) Pleurocystidia predominantly spatula-shaped and strongly pediculated, often slightly thick-walled | <i>Olotia</i> |
| 19* | Pleurocystidia predominantly otherwise | 20 |
| 20 | (19) Stipe distinctly rooting, cystidia with greenish deposits, pileocystidia or similar elements present | <i>Britzelmayria</i> |
| 20* | Features not in this combination | 21 |
| 21 | (20) Basidiocarps large, spores about 10 µm long, pale, germ pore absent or tiny | <i>Kauffmania</i> |
| 21* | Features not in this combination | <i>Psathyrella</i> |

References

- Abarenkov K, Tedersoo L, Nilsson RH, Vellak K, Saar I, Veldre V, Parnasto E, Proust M, Aan A, Ots M, Kurina O, Ostonen I, Jõgeva