

GIAMPAOLO SIMONINI, MATTEO GELARDI, ALFREDO VIZZINI

NEOTYPIFICATION OF *BOLETUS ERYTHROPUS*

**Abstract**

The Authors provide the neotypification of the taxon *Boletus erythropus* Pers., *Observ. mycol. (Lipsiae) in Usteri*, *Ann. Bot.* 15: 23 (1795), subsequently sanctioned by E.M. Fries as *Boletus luridus*  $\beta$  *B. erythropus* (Pers.): Fr., *Syst. mycol. (Lundae)* 1: 391 (1821).

**Riassunto**

Gli Autori propongono la neotipificazione del taxon *Boletus erythropus* Pers., *Observ. mycol. (Lipsiae) in Usteri*, *Ann. Bot.* 15: 23 (1795), successivamente sanzionato da E.M. Fries come *Boletus luridus*  $\beta$  *B. erythropus* (Pers.): Fr., *Syst. mycol. (Lundae)* 1: 391 (1821).

**1. Original description**

Persoon's 1795 diagnosis and description:

**45. *Boletus Erythropus* : pileo pulvinato, rufescente ochraceo, poris minutis aurantio-rubris; stipite subcylindrico levi squamuloso, rubicundo.**

**Obs.** Promiscue, sed rarius in fylvis media æstate cum *Bol. lurido* Schæff. provenit, nec huic e longinquo valde similis, differt vero:

**1. Stipes** in nostro fungo brevior & crassitudine ubique subæqualis, hinc non tuberosus est, apice flavus, basi intusque ruber. **2. Superficies** stipitis squamulosa f. transversim rivulosa, sed non reticulata.

**Ambæ** vero conveniunt species, quod fractæ ad aeris contactum cærulescunt; tubi ad latera flavescentes solummodo apice f. pori aurantio-rubro sunt colore, qui demum expallescit.

Translation in English of Persoon's 1795 diagnosis and description:

"45. *Boletus Erythropus*: pileus pulvinate, ochraceous tending to reddish, pores small golden-yellow to reddish; stipe subcylindrical, weakly squamulose, reddish.

*Obs.* In groups, but rare in woods, in mid summer, associated with *B. luridus* Schaeff., that is not morphologically distant but instead very similar, differing, however, in:

1. The *stipe* in our fungus is shorter and equal, hence it is not tuberose, yellow in the upper part, internally red at the base. 2. *Surface* of the stipe squamulose to radially striped, not reticulate.

Both species when broken and exposed turn blue; tubes wall yellowish, pores are golden yellow-red, tending to become paler".

The main distinguishing features of *Boletus erythropus* according to the original diagnosis and comparative notes are summarized here:

- stipe surface reddish with a yellow apex, squamulose, striped, not reticulate;
- stipe base context: red;
- stipe shape: shorter and equal with respect to *B. luridus*, not tuberose;
- context turning blue when exposed;
- pores gold yellow-red, tending to become paler".

## 2. Sanctioning description

Fries' 1821 sanctioning diagnosis and description:

13. *B. luridus*, pileo pulvinate subtomentoso olivaceo, dein subviscoso fulvo-fuligineo, tubulis subluberis rotundis luteis, ore rubris, stipite crasso reticulato rubro.

*Suillus perniciosus*. *Cæsalp.* p. 617. *Burb. Cent. V.* t. 13. *Batt.* t. 29. *A. B. Hall. helv.* 2307. *B. luridus*, *Schæff.* t. 107 *Pers. syn.* p. 512. *Swartz l. c.* p. 5. *B. rubrolarius*. *Bull. Ch.* p. 326. t. 100, 490. f. 1. *Sv. Bot.* t. 246. *B. tuberosus*. *Schrad. spic.* p. 148! *B. subvescus*. *Schrank.* *B. nigrescens*. *Pall. Reis.* 1. p. 31. *B. mutabilis*. *Schult. l. c.* *B. fre. Bell. app. Ped.* p. 73.

*B. stipite curto, obsolete reticulato. Hall. helv* 2303, 2304. *B. bovinus*. *Bolt.* t 85. *Bol. rubeol. Sowerb.* t. 150. *Id. & sanguin.* *Pers. syn.* p. 512, 513. *B. tuberosus. Schum.* p. 377.

Stipes 2 unc. & multo ultra longus, bulbosus, etiam flavescens. Pileus succosus, sæpe ingens spithamæus, sed & parvus 2-3 unc. reperitur, junior fusco-olivaceus. Caro lutea, mox cœrulescens. Tu-

buli  $\frac{1}{2}$  unc. longi & ultra, ore subrotundo minuto obtuso, demum aurantiaco. Sporidia ochraceo-virentia. *In silvis nemorosis frequens. Aestate, aut.* (v. v.)

$\beta$ . *B. erythropus*, pileo fusco-umbrino decolore, stipite attenuato furfurato.

*Pers. syn. p. 413, Fries Obs. 2, p. 243.*

Stipite tenuiori, punctis minutis squamuloso nec reticulato a priori differt. *B. cinnamomeus* Schum. Sæll. p. 387 status carne immutabili. *Cum priori.* (v. v.)

Translation in English of Fries' 1821 sanctioning diagnosis

"13. *B. luridus*, pileus pulvinate, subtomentose, olivaceous, then subviscose, fulvous-fuliginous; tubes almost free at the stipe, round, yellow, mouth red, stipe ventricose, reticulate, red.

*Suillus perniciosus* ... [omissis]

Stipe 2 ounces, very long, bulbous, also yellowish. Pileus juicy, often evidently concave like the palm of a hand, but also small, in some cases 2-3 ounces, when young grey-olive.



Basidiomata. AMB 12641\_neotypus.

Photo by Giampaolo Simonini

With yellow context, soon bluing. Tubes ½ ounce long and over, pores roundish minutely obtuse, then orange. Spores ochraceous-greenish. *In woods, common. Summer, autumn.* (v. v.).

β. *B. erythropus*, pileus dark brownish, tending to become paler, stipe attenuated at the base, scurfy.

*Pers. Syn. p. 413, Fries Obs. 2. p. 243.*

Stipe thinner, different from the previous due to the small squamulose dots, not reticulate. *Boletus cinnamomeus* Schum. Saell., p. 387, has unchanging context. *It grows with the previous one.* (v. v.).

The reference to *Boletus erythropus*, Persoon, *Synopsis Methodica Fungorum* (Gottingae): 513 (wrongly cited as "413" by Fries) (1801), gives the following significant features: "*pileo pulvinato rufescente subumbrino*" and "*Stip. ubi terram intrat acuminatus, interne sanguineo-ruber, externe rivuloso-squamulosus*". In the reference to *Boletus erythropus*, Fries, *Observationes Mycologicae* 2 (Hafniae): 243 (1818) the stipe is described as "*subaequali squamuloso rubicundo ... glaber squamulosus squamulis confertissimis punctiformibus obscurioribus persistentibus, intus totus solidus fibrillosus rhabarbarino-flavus*".

The reference to *Boletus cinnamomeus* Schumach., *Enum. Plant. Saell.* (Hafniae): 377 (wrongly cited as "387" by Fries) (1803), gives the following description: "*sparsus, gregarius, pileo pulvinato hemisphaerico ad tactum molli, fusco-umbrino; subtus convexus, rubro-cinnamomeus poris rotundis; stipite longiusculo cylindrico rubescente apicem versus flavescente. An B. rubeolaris Bull. 5. 490. 1. In pinetis haud infrequens. Autumno. Caro pallide flavescens immutabilis. Pileus 1 ½ poll. Latus. Stipes 2-3 poll. Longus, 3 lin. crassus*".

The reference to *Boletus rubeolaris* Bull., *Herb. Fr.* (Paris) 11: tab. 490 (1791) gives an iconographic representation with a reticulum in the upper part of the stipe, referable to *Suillellus luridus* (Schaeff.) Murrill.

The main features of the *Boletus luridus* β. *B. erythropus* sanctioning diagnosis are summarized here:

- stipe surface red, also yellowish (deriving from *B. luridus* description), squamulose due to small dots, scurfy, not reticulate;
- stipe base context: not described (blood red in PERSOON, 1801);
- stipe shape: narrower than in *B. luridus*, attenuated at the base (rooted in the soil in PERSOON, 1801; reddish at base and yellowish at apex in SCHUMACHER, 1803);
- context soon turning blue when exposed (pale yellow and unchanging in SCHUMACHER, 1803; rhubarb yellow in any part in FRIES, 1818);
- pores gold yellow-red, tending to become paler (cinnamon red in SCHUMACHER, 1803).

### 3. Discussion

A modern neotype (specimen) is here designated to serve as nomenclatural type of the taxon *Boletus erythropus* Pers. Being a holotype not indicated by PERSOON (1796), it is here provided the designation of a neotype (Art. 9.11). *Boletus erythropus* Pers. was later sanctioned by FRIES (1821) at an undefined subspecific rank ("β", Art. 32.1), but no elements (specimen or illustrations) associated with the name in the protologue and/or the sanctioning treatment (Art. 9.10) appear to exist. Consequently, a voucher specimen recently collected and supported by molecular investigation (nu ITS rDNA sequence) and protographic documentation, consistent at best with the original description and protologue by Persoon, that also fits well with the sanctioning description and protologue by Fries, is selected.

Neotype designated here: AMB 12641 (MTB 337873; ITS sequence GenBank accession nr. KC734546\*) - ITALY, Abruzzo, Pietracamela (Teramo), loc. Intermesoli, mixed wood with *Quercus* sp., *Ostrya carpinifolia* Scop., *Castanea sativa* Mill., 26/09/2010, Leg. G. Simonini, A. Arcangeli.

\* (The ITS sequence nr. KC734546 is mistakenly linked to voucher AMB12638 in GenBank).

#### 4. Relevant articles of the Code of Nomenclature

##### TYPIFICATION

9.7 A neotype is a specimen or illustration selected to serve as nomenclatural type if no original material is extant, or as long as it is missing.

9.10 The type of the name of a species or infraspecific taxon adopted in one of the works specified in Art. 13.1 (d) [note of the Authors: Fries, *Systema Mycologicum* 1, 1821], may be selected from among the elements associated with the name in the protologue and/or the sanctioning treatment.

9.11 If no holotype was indicated by the author of a name of a species or infraspecific taxon, or when the holotype or previously designated lectotype has been lost or destroyed, or when the material designated as type is found to belong to more than one taxon, a lectotype or, if permissible (Art. 9.7), a neotype as substitute for it may be designated.

##### VALID PUBLICATIONS OF NAMES

32.1... [omissis]

Note 1. The use of typographic signs, numerals, or letters of a non-Latin alphabet in the arrangement of taxa (such as Greek letters  $\alpha$ ,  $\beta$ ,  $\gamma$ , etc. in the arrangement of varieties under species) does not prevent valid publication, as rank denoting terms and devices are not part of the name.

##### GLOSSARY

Element (as applied to typification) – applied to a specimen or illustration eligible as a type Name. A name that has been validly published, whether it is legitimate or illegitimate.

Author's addresses

GIAMPAOLO SIMONINI

Via Bellaria, 8 - I 42121 Reggio Emilia.

E-mail: giamsim@tin.it

MATTEO GELARDI

Via Angelo Custode, 4/a - I 00061 Anguillara Sabazia (RM).

E-mail: timal80@yahoo.it

ALFREDO VIZZINI

Department of Life Sciences and Systems Biology, Università di Torino

Viale P.A. Mattioli, 25 - I 10125 Torino.

E-mail: alfredo.vizzini@unito.it

## References

- FRIES E.M. – 1818: *Observationes Mycologicae praecipue ad illustrandam Floram Suecicam*. Pars secunda: 243. Hafniae.
- FRIES E.M. – 1821: *Systema Mycologicum, sistens fungorum ordines, genera et species, huc usque cognitae, quas ad normam methodi naturalis determinavit, disposuit atque descripsit*. Volumen I: 391. Ex Officina Berlingiana. Lundae.
- MCNEILL J., BARRIE F.R., BUCK W.R., DEMOULIN V., GREUTER W., HAWKSWORTH D.J., HERENDEEN P.S., KNAPP S., MARHOLD K., PRADO J., PRUD'HOMME VAN REINE W.F., SMITH G.F., WIERSEMA J.H. & TURLAND N.J. – 2012: *International Code of Nomenclature* (Melbourne Code). Regnum Vegetabile 154. Koeltz Scientific Books. Königstein.
- PERSOON C.H. – 1795: *Observationes Mycologicae, in Usteri, Ann. Bot. 15: 23. Seu descriptiones tam novorum, quam notabilium fungorum. Pars prima*: 23. Lipsiae.
- PERSOON C.H. – 1801: *Synopsis Methodica Fungorum*: 513. Gottingae.
- SCHUMACHER C.F. – 1803: *Enumeratio Plantarum in partibus Saellandiae septentrionalis et meridionalis*: 377. Hafniae.