Tulasnella (Waaszwam)

Key to the European species of *Tulasnella.*
Based on Roberts 1999. Modified according to additional species, and synonymy and distribution data in Mycobank and Index Fungorum
See also Dam 2018.

Hymenium types:

- violea-type hymenium compact, branching; context ceraceous, not gelatinous (but may be indistinct)
- pinicola-type basidia produced in clusters, hyphae in a slightly gelatinized matrix and context (when visible) therefore gelatinous; often growing inconspicuously in corticiaceae (often *Botryobasidium*)

Use spores from a spore print!

Bold - Known from the Netherlands and/or Flanders (Belgium)
Dutch names between brackets (NL - Dutch, VL - Flamish)

Mainkey

1 Clamp connections absent, or rare and scattered on basal hyphae only . . . . . Key A
Clamp connections present at all septa . . . . . Key B

Key A - Clamp connections absent or rare

1 With conidiophores; spores ellipsoid to slightly reniform. . . . . (Valentijnswaaszwam) ***T. valentini***
Van de Put, Sterbeeckia 17: 44-69
Without conidiophores 2
2 Spores distinctly spiny . . . . . *T. echinospora*
Roberts, Crypt. Mycol. 25: 23-27
Spores smooth 3
3 Spores globose to ellipsoid or cylindrical, Q = 1-1.5, always < 15 µm long 4
Spores allantoid or spiralled and/or often > 15 µm long. 13
4 Cystidia present, conspicuous, irregularly swollen, often monilioid, sometimes branching, up to 90 µm long; spores 4-7 x 3.5-6 µm . . . . . (Kogelsporige waaszwam) ***T. cystidiophora***
Jülich: 460
H&K: 116
Roberts, Mycol. Res. 1431-1452
Van de Put et al., Sterbeeckia 17: 44-69
Cystidia absent 5
5 Most spores globose to ellipsoid, Q = 1-1.6 6
Most spores oblong to cylindrical, Q = 1.7-4.5. 9
6 Spores small, mostly 2.5-4.5 x 2.5-3.5 µm, a minority longer and more slender; hymenium of violea-type . . . . . (Roze waaszwam) ***T. eichleriana***
Jülich: 456
H&K: 116
Roberts, Mycol. Res. 1431-1452
Van de Put et al., Sterbeeckia 17: 44-69
Spores larger, most of them over 5 x 3.5 µm 7
7 Most spores slightly to distinctly tapering at both ends, mostly 8-12 x 4-6 µm; hymenium of vio-

lea-type . . . . . (Violette waaszwam) ***T. pallida***
H&K: 116
Roberts, Mycol. Res. 1431-1452
Van de Put et al., Sterbeeckia 17: 44-69

Spores not tapering, smaller 8

8 Most spores 5.5-9 x 5.5-7.5 µm, a minority more slender; hyphae 2.5-6 µm wide; hymenium of violea-type; fruitbody often conspicuous . . . . . (Lila waaszwam) ***T. violea***
Jülich: 456
H&K: 116
Roberts, Mycol. Res. 1431-1452

Most spores 5-6.5 x 3-5 µm; hyphae 1.5-3 µm wide; hymenium of pinicola-type; fruitbody often inconspicuous and/or intermingled in corticiaceae . . . . . (Witte waaszwam) ***T. albida***
Jülich: 458
H&K: 116
Roberts, Mycol. Res. 1431-1452
Van de Put et al., Sterbeeckia 17: 44-69

9 Spores 6-7.5 x 3-3.5 µm; hymenium of violea-type. . . . . (Berijpte waaszwam) ***T. pruinosa***
Jülich: 457
Roberts, Mycol. Res. 1431-1452
Van de Put et al., Sterbeeckia 17: 44-69

Spores larger, mostly over 7.5 µm long. 10

10 Most spores slightly to distinctly tapering at both ends, mostly 8-12 x 4-6 µm; hymenium of violea-type . . . . . (Violette waaszwam) ***T. pallida***
H&K: 116
Roberts, Mycol. Res. 1431-1452
Van de Put et al., Sterbeeckia 17: 44-69

Spores narrower and/or not tapered at both ends 11

11 Spores 6.5-10 x 3.5-4.5 µm, often depressed; hymenium of pinicola-type . . . . . .(Dennenwaaszwam) ***T. pinicola***
Jülich: 458
H&K: 116
Roberts, Mycol. Res. 1431-1452
Van de Put et al., Sterbeeckia 17: 44-69

At least some spores over 10 µm long; basidia not formed in clusters 12

12 Spores 8.5-12 x 4-4.5 µm, often ventrally depressed, with obtuse apex. . . . . *T. fuscoviolacea*
Jülich: 456
H&K: 117
Roberts, Mycol. Res. 1431-1452

Spores 10-12.5 x 2.5-3 µm, often with tapered apex . . . . . *T. pallidocremea*
Jülich: 456
H&K: 117
Roberts, Mycol. Res. 1431-1452

13 Spores allantoid, mostly under 15(-16) µm long 14

Spores spiralled or coiled, or often > 15 µm long 17

14 Spores 10-15 x 3-4.5 µm, often deeply angled; basidia often bisterigmate, and with widely separated sterigmata . . . . . .(Klontjeswaaszwam (NL), Knotssteelwaaszwam (VL)) ***T. danica***
Jülich: 457
H&K: 117
Roberts, Mycol. Res. 97: 213-220
Van de Put et al., Sterbeeckia 17: 44-69

Most spores shorter 15

15 Spores larger, 6.5-12 x 2.5-3.5 µm, distinctly allantoid to angled; hymenium of pinicola-type . . . . . *T. saveloides*
Roberts, Mycol. Res. 97: 213-220

Spores 5-7.5 x 2.5-3 µm, only weakly allantoid, apex mostly obtuse. 16

16 Hyphae 2.5-3.5 µm wide; basidia mostly clavate; hymenium of violea-type . . . . . (Kortsporige waaszwam) ***T. tomaculum***
H&K: 117
Roberts, Mycol. Res. 97: 213-220

Van de Put et al., Sterbeeckia 17: 44-69

Hyphae 1.5-2(-3) µm wide; basidia mostly spheropedunculate with widely separated sterigmata; hyphae trailing thinly over the substrate . . . . . *T. dissitispora*
Roberts, Mycol. Res. 98: 1235-1244

17 Spores distinctly coiled, spiralled or semi- to almost completely circular 18
Spores at most weakly curved or sinuous 20

18 Sinuous cystidia present; hyphae up to 2 µm wide . . . . . *T. falcifera*
Roberts, Mycol. Res. 96: 233-236

Cystidia absent; hyphae wider. 19

19 Spores question-mark-shaped, spiralled at the tip . . . . . *T. helicospora*
Jülich: 455
H&K: 117
Roberts, Mycol. Res. 96: 233-236

Spores bent in a semi- or almost full circle . . . . . *T. bucina*
Duhem et al., Bull. Soc. Mycol. France 128: 261-265

20 Basidia usually narrow and slender; hyphae up to 2 µm wide, trailing thinly over the substrate; spores 19-28 x 3-4 µm, curved and constricted . . . . . *T. quasiflorens*
Roberts, Mycol. Res. 98: 1235-1244

Basidia conventional; hyphae 2-6 µm wide; hymenium of violea-type 21

21 Spores 23-51 x 2-3 µm, Q = 8-17, straight or sinuous . . . . . (Ingesloten waaszwam) ***T. deliquescens***
H&K: 117
Roberts, Mycol. Res. 98: 1235-1244
Van de Put et al., Sterbeeckia 17: 44-69

Sporeswider or shorter, fusiform to cylindrical 22

22 Spores fusoid, 14.5-26 x 6-9 µm, without apical projection . . . . . *T. kongoensis*
Roberts, Windahlia 22: 15-22

Spores narrower and/or at least partly with apical projection (mucronate) 23

23 Spores mostly 16-30 x 3.5-5 µm, fusoid and ± straight, often conspicuously mucronate . . . . . (Langsporige waaszwam) ***T. calospora***
Jülich: 455
H&K: 117
Roberts, Mycol. Res. 98: 1235-1244
Van de Put et al., Sterbeeckia 17: 44-69

Spores (somewhat) smaller, sometimes sinuous, and not or hardly mucronate 24

24 Spores narrowly fusoid to cylindrical, straight, 10-20 x 3-4.5 µm, Q = 2.5-4.7 . . . . . (Pipse waaszwam) ***T. brinkmannii***
Jülich: 457
Roberts, Mycol. Res. 98: 1235-1244
Van de Put et al., Sterbeeckia 17: 44-69

Spores cylindrical, often ventrally depressed or sinuous, Q = 3-9 25

25 Spores with rounded ends, 9-20 x 2.5-3 µm . . . . . *T. balearica*
Roberts, Mycotaxon 60: 111-123

Spores with tapering ends, 11-20 x 2.5-5 µm. . . . . *T. convivalis*
Trichiès, Bull. Soc. Mycol. France 122: 29-60

Key B - Clamp connections present on all septae

1 Spores globose to cylindrical 2
Spores spiralled, coiled, or allantoid 8

2 Cystidia present and conspicuous 3
Cystidia absent 4

3 Cystidia large, up to 120 µm long; spores 4-6 x 3-5 µm . . . . . *T. traumatica*
Jülich: 459
Roberts, Mycol. Res. 1431-1452

Cystidia smaller, up to 60 µm long; spores globose, 5.5-7.5 µm diameter . . . . . (Spuugwaaszwam) ***T. hyalina***

Jülich: 459
H&K: 118
Roberts, Mycol. Res. 1431-1452
Van de Put et al., Sterbeeckia 17: 44-69

4 Spores mostly globose to subglobose, Q = 1-1.25 5
Spores mostly ellipsoid to cylindrical, Q = 1.3-3. 6

5 Hyphae 3-6 µm wide; hymenium of violea-type; spores 6-8 x 5.5-7 µm . . . . . (Blauwgrijze waaszwam (NL), Vale waaszwam (VL)) ***T. subglobospora***
H&K: 118
Hjortstam, Windahlia 12/13: 19-28
Van de Put et al., Sterbeeckia 17: 44-69

Hyphae narrower; hymenium of pinicola-type; spores 4-6 x 3.5-5.5 µm . . . . . (Kleinsporige waaszwam) ***T. bourdotii***
Jülich: 459
Roberts, Mycol. Res. 1431-1452

6 Spores large, 11.5-14 x 6-7.5 µm. . . . . (Talkwaaszwam) ***T. griseorubella***
Jülich: 459
H&K: 118
Hjortstam, Windahlia 12/13: 19-28
Van de Put et al., Sterbeeckia 17: 44-69

Spores smaller, less than 11 µm long 7

7 Spores narrow, cylindrical to slightly allantoid, 4.5-6.5 x 2-2.5 µm, Q = 2.3-3. . . . . *T. bifrons*
Jülich: 459
Roberts, Mycol. Res. 98: 1235-1244

Spores wider, 4.5-10 x 3-5.5 µm, Q = 1.3-2; hymenium of pinicola-type. . . . . (Korstjeswaaszwam) ***T. thelephorea***
H&K: 118
Roberts, Mycol. Res. 98: 1431-1452
Van de Put et al., Sterbeeckia 17: 44-69

8 Spores allantoid 9
Spores spiralled or coiled. 11

9 Hyphae 0.5-1.5 µm wide, thinly trailing over the substrate; basidia small and often narrow; spores deeply angled, 5-8 x 2-2.5 µm . . . . . *T. permacra*
H&K: 118
Roberts, Mycol. Res. 97: 213-220

Hyphae broader 10

10 Spores 4.5-6.5 x 2-2.5 µm, cylindrical to weakly allantoid . . . . . *T. bifrons*
Jülich: 459
Roberts, Mycol. Res. 98: 1235-1244

Spores 7-10 x 2.5-3 µm, a minority still larger, weakly to strongly allantoid . . . . . (Kromsporige waaszwam) ***T. allantospora***
Syn. *T. curvispora*
Jülich: 458
H&K: 118
Roberts, Mycol. Res. 97: 213-220
Van de Put et al., Sterbeeckia 17: 44-69

11 Most spores question-mark-shaped . . . . . (Spiraalspoorwaaszwam) ***T. interrogans***
Roberts, Mycol. Res. 96: 233-236
Van de Put et al., Sterbeeckia 17: 44-69

Spores looped or coiled, but not question-mark-shaped . . . . . (Kronkelsporige waaszwam) ***T. anguifera***
Roberts, Mycol. Res. 96: 233-236

Synonyms

T. albolilacea now *T. pallida*

T. araneosa now *T. pruinosa*

T. cremea now *T. thelephorea*

T. curvispora now *T. allantospora*

T. inclusa now *T. thelephorea*

T. obscura now *T. eichleriana*

T. rosella now *T. deliquescens*

T. rubropallens now *T. allantospora*

T. violacea p.p. now *T. pallida*

Remarks

T. subglobospora is sometimes written as *T. subglobispora*.

Literature

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