

Checklist of the genus *Cortinarius* in Romania: taxonomic and distributional insights

Emerencia Szabó¹ , Avar-Lehel Dénes^{1,2} * , Róbert Veres³ ,
Bálint Dima⁴  and Lujza Keresztes¹ 

¹Centre 3B, Babeş-Bolyai University, Cluj-Napoca, Romania; ²Institute of Advanced Studies in Science and Technology (STAR-UBB Institute); Babeş-Bolyai University, Cluj-Napoca, Romania;
³Hungarian Department of Biology and Ecology, Babeş-Bolyai University, Cluj-Napoca, Romania;

⁴Department of Plant Anatomy, Institute of Biology,
Eötvös Loránd University, Budapest, Hungary

* **Corresponding author, E-mail:** avar.lehel@gmail.com

*Article history: Received 1 September 2025; Revised 27 November 2025;
Accepted 27 November 2025; Available online 20 December 2025*

©2025 Studia UBB Biologia. Published by Babeş-Bolyai University.



This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.

Abstract. The genus *Cortinarius* is one of the most diverse ectomycorrhizal lineages of *Basidiomycota*, yet its diversity in Romania has remained poorly documented. This study presents the first comprehensive checklist of *Cortinarius* sensu lato in the country, integrating historical records, literature data, field surveys, and molecular data. A total of 231 species is confirmed, including 110 supported by DNA sequence evidence and 121 validated solely based on morphology. Spatial analysis of collection sites highlights two major research hotspots in the Apuseni Mountains and the Transylvanian Basin, reflecting uneven sampling effort. Despite its richness and ecological importance, Romanian *Cortinarius* remains underrepresented in global sequence repositories. These findings emphasize the need for broader molecular surveys and systematic biodiversity mapping to resolve species boundaries and better integrate Romanian taxa into European and global frameworks.

Keywords: *Agaricales*, barcoding, *Basidiomycota*, integrative taxonomy, ITS sequences, spatial distribution.

Introduction

General fungal diversity and taxonomy

Fungi are widespread organisms with substantial ecological and economic importance. Despite their global distribution, fungal taxonomy remains incompletely understood. Molecular and evolutionary studies indicate that fungi diverged from a common eukaryotic ancestor shared with *Dermocystidium* and *Ichthyophonus* approximately one billion years ago (Berbee and Taylor 2001). Since then, they have evolved into a distinct eukaryotic lineage, comprising nearly as many species as plants and animals.

The broad application of molecular phylogenetics in fungal systematics has shaped the current classification. Today, fungi are grouped into over 200 orders distributed across 12 phyla, organized into six major groups and two subkingdoms: *Dikarya*, which includes *Ascomycota*, *Basidiomycota*, and *Entorrhizomycota*; and *Chytridiomycota*, comprising *Chytridiomycota*, *Monoblepharidomycota*, and *Neocallimastigomycota*. Additional lineages include *Mucoromycota*, *Zoopagomycota*, *Blastocladiomycota*, and the *Opisthosporidia* group (*Aphelidiomycota*, *Rozellomycota*/*Cryptomycota*, and *Microsporidia*) (Barr 2001; Li *et al.*, 2021).

Taxonomic issues with Cortinarius

The family *Cortinariaceae* is the most species-rich within the phylum *Basidiomycota* (Kirk *et al.*, 2008), comprising more than 3,000 described ectomycorrhizal species with a cosmopolitan distribution (Roskov *et al.*, 2019). Traditionally, this family included eleven genera (Watling *et al.*, 1993). However, morphological taxonomy has undergone major revisions with the implementation of integrative approaches.

Cortinarius species display remarkable morphological variability, ranging from mycenoid to tricholomatoid forms. The pileus varies across species, appearing dry, fibrillose, silky, squamulose, or viscid. Fruiting bodies may be uniformly brown or strikingly colorful, spanning from yellow to purple (Peintner *et al.*, 2004). Despite this variability, some features consistently characterize the genus: spores are typically brownish in print, ornamented (finely to coarsely verrucose), and lack both a germ pore and perisporium. Another universally recognized trait is the presence of an inner veil, the cortina (Singer 1986).

Morphology-based classifications (Fries 1821; Fries 1838; Moser 1975; Moser 1983; Moënne-Loccoz *et al.*, 1990; Brandrud *et al.*, 1990, 1992, 1998; Bidaud *et al.*, 1994; Brandrud *et al.*, 1995) defined several groups and subdivisions within the genus. Nevertheless, molecular phylogenetics has revealed profound inconsistencies in these frameworks. Since the introduction of molecular methods in fungal taxonomy (Liu *et al.*, 1997; Peintner *et al.*, 2001, 2002; Peintner *et al.*,

2004; Garnica *et al.*, 2005; Soop *et al.*, 2019) , it has become clear that some previously accepted phyla are polyphyletic, and several new clades and sections have been described.

A major taxonomic revision by Liimatainen *et al.* (2022) proposed dividing the family into ten genera, based entirely on molecular evidence: *Aureonarius*, *AustroCortinarius*, *Calonarius*, *Cortinarius*, *Cystinarius*, *Hygdonarius*, *Myrinarius*, *Phlegmacium*, *Thaxterogaster*, and *Volvanarius*. Despite intensive research, recent findings suggest that this classification still requires revision (Gallone *et al.*, 2024). In this paper, we use the traditional species names of 231 *Cortinarius*, with the corresponding new names (according to Liimatainen *et al.*'s revision) provided in parentheses (Tab. 1).

This study focuses on *Cortinarius* species reported from Romania, aiming to synthesize historical records, recent field observations, and available molecular data. While the genus *Cortinarius* has been extensively studied across Europe (e.g., Brandrud 1996; Garnica *et al.*, 2003, 2005, 2009; Frøslev *et al.*, 2007; Niskanen *et al.*, 2008; Suárez-Santiago *et al.*, 2009; Niskanen *et al.*, 2009, 2011; Garnica *et al.*, 2011; Niskanen *et al.*, 2012, 2013, 2016; Liimatainen 2013; Frøslev *et al.*, 2015; Brandrud and Dima 2014; Dima *et al.*, 2014, 2016; Liimatainen *et al.*, 2014, 2020; Garrido-Benavent *et al.*, 2015; Frøslev *et al.*, 2017; Brandrud *et al.*, 2018a, 2018b; Brandrud *et al.*, 2019; Bidaud *et al.*, 2021), Romanian data remain scarce, fragmented, and largely outdated.

Materials and methods

In this review of the genus *Cortinarius* from Romania, we aimed to clarify the national species list using published data. We systematically surveyed 35 literature sources covering the period 1900–2023, including both morphological and molecular studies. These publications comprised regional surveys, ecological assessments, and species checklists. Since the earliest reports from the country were based exclusively on morphological identification, our first step was to compile a comprehensive database of published species records. In the second step, we updated the nomenclature of these taxa according to the most recent taxonomic framework, using Index Fungorum as the primary reference. Finally, we filtered the dataset to eliminate misapplied names, synonyms, and outdated combinations to establish a more accurate and standardized checklist of Romanian *Cortinarius* species.

To assess the geographical distribution of these records, we performed a spatial analysis of collection sites. A Kernel Density Estimate (KDE) of site coordinates was generated in R (v4.4.3) using the packages ggplot2 (v3.5.1),

sf (v1.0-19), and maptiles (v0.9.0), with all coordinates projected in EPSG:3857. The KDE visualization highlights collection hotspots across Romania and allows for the identification of regions that have been studied more intensively.

Results and discussion

Historical Romanian research

Mycological exploration in Transylvania has a long and well-documented tradition, beginning in 1778 when József Benkő first recorded 13 edible fungal species, including representatives of the genera *Agaricus* and *Hydnum* within a floristic framework (Vörösvári 2017), a contribution soon expanded by István Mátyus in this 1787 publication *Új Diaetetica*, which included additional taxa such as *Agaricus* and *Boletus* (Mátyus 1787).

By the late 19th century, important advances were made through the activity of several renowned mycologists: István Schulzer, recognized as a funder of Hungarian mycology, along with Károly Kalchbrenner and Frigyes Hazslinszky, survey regions such as Banat, Băița and Oradea, while József Téglási Ercsei provided sporadic data from Cluj County, and Michael Fuss studied the Făgăraș and Rusca Mountains, identifying 160 fungal species around Sibiu (Fuss 1866). Complementary to these contributions, Gyula Istvánffi in 1895 described 40 taxa using vernacular names, thus bridging ethomycological knowledge and scientific taxonomy.

At the beginning of the 20th century, László Hollós enriched the regional inventory with records from genera such as *Calvatia*, *Lycoperdon*, *Bovista*, and *Scleroderma*, while Gusztáv Moesz compiled a list of 76 taxa from Reci and provided a foundation for the study of both macro- and microfungi. Around the same time, Margit Csűrös-Káptalan and István Csűrös initiated the first coecological studies of fungi, later complemented by the work of Kálmán László in collaboration with George Silaghi and Dénes Pázmány (Sántha 1999).

Following 1950, mycological research in Romania intensified considerably, culminating in Bontea's extensive documentation of 8,727 fungal species (Bontea 1985, 1986), which attest to the remarkable richness of Transylvanian mycodiversity. Nevertheless, despite this solid historical and taxonomic foundation, targeted studies on the genus *Cortinarius* remained scarce.

Most Romanian records of *Cortinarius* are based solely on morphological characters. The first such report was published by Pál-Fám (1997), who, during a survey of macrofungal diversity in the Baraolt Mountains, documented *C. trivialis* from Băile Șugaș in association with tree species of the order Fagales, *C. subfulgens*

from Malnaş Băi, and *C. balaustinus* from the Baraolt Mountains. Bucşa (2007), recorded only *C. olearioides* among 118 taxa from the Breite Natural Reserve, this contribution further expanded the known distribution of the genus in Romania, but like earlier reports, relied exclusively on morphological identification. Chinan *et al.* (2014; 2008) explored the mycobiota of Eastern Carpathian peat bogs, frequently encountering *C. sanguineus* and *C. cinnamomeus*, and later identified nine *Cortinarius* species in *Sphagno-Piceetum* communities, including *C. camphoratus*, *C. collinitus*, *C. evernius*, *C. flexipes*, *C. sanguineus*, *C. scaurus*, and *C. tubarius*.

In the Southern Carpathians Ciortan (2013a, 2013b) documented *C. camphoratus*, *C. caperatus*, *C. cinnabarinus*, *C. cinnamomeus*, *C. multiformis*, *C. orellanus*, and *C. trivialis* using traditional morphological methods. She also surveyed fungal diversity within the Natura 2000 site ROSCI0188, identifying 116 species, including five *Cortinarius* species with potential medicinal or toxicological relevance. Environmental studies by Elekes *et al.* (2010) utilized *Cortinarius* species (*C. largus*, *C. armillatus*) as bioindicators of soil pollution in the Bucegi Mountains due to their known heavy metal accumulation capabilities. Subsequent work (Elekes *et al.*, 2014) extended this to include *C. callisteus* and *C. subfulgens*. Bîrsan *et al.* (2013) examined ectomycorrhizal associations in Eastern Carpathian forests, identifying several *Cortinarius* taxa linked to specific vegetation types, including *C. sanguineus*, *C. semisanguineus*, *C. flexipes*, *C. croceus*, *C. collinitus*, and *C. caperatus* these species are well-known about their ectomycorrhizal connection with species from order *Piceae*.

The Transylvanian region has been extensively studied over the past 10–15 years, thanks to the efforts of mycological associations and the organization of congresses and field camps, primarily in Harghita and Covasna counties. A significant milestone was reached during the 36th J.E.C. Congress (2018, Bálványos), where 74 participants collected samples over a five-day period, mainly from Harghita County (Mohos peat bog, Lake St. Anna, and Lucs peat bog), Covasna County (Bálványos, Băile Şugaş, Veresvíz, Komandó, Ojoz), and Bacău County (Lesenc Valley). In total, 440 taxa were identified based solely on morphological examination, including 19 species reported for the first time in Romania. Within this dataset, 68 species of *Cortinarius* were recorded, of which 29 represented new county records, and several taxa were added to the Romanian mycobiota (Szász *et al.*, 2022; Bellù *et al.*, 2019). From the same geological region, Pál-Fám *et al.* (2022) documented 11 additional *Cortinarius* species.

From the territory of Hoghiz, a total of 245 taxa were documented during mycological research conducted by Szász (2022). Among these, seven *Cortinarius* species were recorded: *C. alboviolaceus*, *C. balteatocumatilis*, *C. bolaris*, *C. caperatus*, *C. melatonus*, *C. semisanguineus*, and *C. torvus* but none of which represented

new records for Romania. During a mycological camp organized in 2018 by the László Kálmán Society in Harghita County, a total of 105 species were identified using traditional taxonomic methods. Among these, two *Cortinarius* species were recorded: *C. caperatus* and *C. croceus* (Pál-Fám *et al.*, 2022). From the same camp in 2019, 15 *Cortinarius* species were recorded and later published (Pál-Fám *et al.*, 2022). In 2020, the total documented taxa during this camp included 237 from Vărșag and 58 from Harghita, among which seven *Cortinarius* species were recorded (Pál-Fám *et al.*, 2022).

In 2023, Pál-Fám *et al.* published a comprehensive checklist of Transylvanian macrofungi, based on the examination of 119 literature sources spanning 1787–2020. As a result, they compiled a database of 1,477 macrofungal species. Among these, 133 species belonged to the genus *Cortinarius*, including 43 species newly recorded for Romania (Pál-Fám *et al.*, 2023). In contrast, relatively little information is currently available from Maramureș County. During July 2019, Pál-Fám *et al.* (2022a) collected 274 taxa, among which three *Cortinarius* species were recorded: *C. balteatocumatilis*, *C. largus*, and *C. renidens*.

Currently the Red List of Romania includes eight threatened *Cortinarius* species (Tănase and Pop 2005): *C. bulliardii* and *C. orellanus* – Vulnerable; *C. cinnabarinus*, *C. cotoneus*, *C. dibaphus*, *C. napus*, *C. percomis*, *C. praestans* – Near Threatened. Despite these listings, most records lack molecular confirmation, precise locality data, or standardized diagnostic criteria. In their study, Szabó *et al.* (2023) aimed to enhance the understanding of *Cortinarius* diversity in the Romanian Carpathians by collecting and analyzing 234 specimens from the Apuseni Mt. region. By applying molecular barcoding of nrDNA ITS sequences, they identified 109 species (Fig. 1), significantly expanding the known diversity in the area. Notably, 66 of these species were new records for Romania, underscoring the region's rich and previously underexplored fungal biodiversity.

An analysis of global genetic repositories further illustrates this underrepresentation of Romanian data. International sequence databases such as NCBI GenBank and BOLD Systems currently contain over 30,200 ITS sequences of *Cortinarius*. In stark contrast, as of 2025, only 246 ITS sequences originated from Romania, reflecting the country's minimal contribution to global molecular data on the genus. This shortfall underscores the need to prioritize molecular tools: DNA barcoding, multilocus phylogenies, and genomic sequencing to achieve reliable species delimitation and integrate Romanian taxa into broader biogeographic frameworks.



Figure 1. Basidiomata of some *Cortinarius* species previously recorded by morphological methods and later confirmed by molecular analyses: A) *C. bergeronii*, B) *C. anomalus*, C) *C. largus*, D) *C. croceus*, E) *C. elegantissimus*, F) *C. subtortus*, G) *C. sulfurinus*, H) *C. talimultiformis*, I) *C. xanthochlorus*, J) *C. balteatus*, K) *C. calochrous*, L) *C. glaucopus*.

List of *Cortinarius* species documented in Romania

Based on the published literature data, the checklist documents 231 taxa of *Cortinarius* sensu lato in Romania (Tab. 1), all supported by morphological records; 110 of these are additionally confirmed by molecular analyses, while 121 remain morphology-based only.

Table 1. *Cortinarius* species list in Romania

Species name	Morph.	References	Molec.	References
<i>Cortinarius acutus</i> (Pers.) Fr. 1838	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius aereus</i> Rob. Henry 1952	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius alboviolaceus</i> (Pers.) Fr. 1838	x	Bellù <i>et al.</i> (2019)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius allutus</i> Fr. 1838 (<i>Phlegmacium allutum</i> (Fr.) M.M. Moser 1960)	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius alnetorum</i> (Velen.) M.M. Moser 1967	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius anfractoides</i> Rob. Henry & Trescol 1987	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius angelesianus</i> A.H. Sm. 1944	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius anomalus</i> (Fr.) Fr. 1838	x	Bellù <i>et al.</i> (2019)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius anfractus</i> Fr. 1838	x	Eliade (1965)	NA	
<i>Cortinarius anserinus</i> (Velen.) Rob. Henry 1986 (<i>Phlegmacium anserinum</i> Velen. 1920)	x	Bellù <i>et al.</i> (2019), Szász <i>et al.</i> (2022)	NA	
<i>Cortinarius arcifolius</i> Rob. Henry 1936	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius arcuatorum</i> Rob. Henry 1939 (<i>Calonarius arcuatorum</i> (Rob. Henry) Niskanen & Liimat. 2022)	x	Lupoi (1965), as <i>C. fulvoincarnatus</i>	NA	
<i>Cortinarius arcuatus</i> (Bull.) Quél. 1883	x	Eliade (1965)	NA	
<i>Cortinarius argentatus</i> (Pers.) Fr. 1838	x	Chifu <i>et al.</i> (1971)	NA	
<i>Cortinarius argutus</i> Fr. 1838 (<i>Phlegmacium argutum</i> (Fr.) Niskanen & Liimat., in Liimatainen, Kim, Pokorny, Kirk, Dentinger & Niskanen 2022)	x	Pál-Fám <i>et al.</i> (2023)		
<i>Cortinarius armeniacus</i> (Schaeff.) Fr. 1838	x	Eliade (1965)	NA	
<i>Cortinarius armillatus</i> (Fr.) Fr. 1838	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius atrovirens</i> Kalchbr. 1874	x	Pop <i>et al.</i> (1999)	NA	

CORTINARIUS CHECKLIST AND DISTRIBUTION IN ROMANIA

Species name	Morph.	References	Molec.	References
<i>Cortinarius aureifolius</i> Peck 1885	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius aureopulverulentus</i> M.M. Moser 1952 (<i>Calonarius aureopulverulentus</i> (M.M. Moser) Niskanen & Liimat. 2022)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius balaustinus</i> Fr. 1838	x	Pop <i>et al.</i> (1999)	NA	
<i>Cortinarius balteatocumatilis</i> Rob. Henry 1939 (<i>Phlegmacium balteatocumatile</i> (Rob. Henry ex P.D. Orton) Niskanen & Liimat. 2022)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius balteatus</i> Fr. 1838 (<i>Phlegmacium balteatum</i> (Fr.) A. Blytt 1905)	x	Eliade (1965)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius bergeronii</i> (Melot) Melot 1992	x	Bellù <i>et al.</i> (2019)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius betulinus</i> J. Favre 1948	x	Pop <i>et al.</i> (1999)	NA	
<i>Cortinarius bivelus</i> (Fr.) Fr. 1838	x	Todorescu (1972)	NA	
<i>Cortinarius bolaris</i> (Pers.) Fr. 1835	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius bovinus</i> Fr. 1838	x	Eliade (1965)	NA	
<i>Cortinarius brunneus</i> (Pers.) Fr. 1838	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius bulliardii</i> (Pers.) Fr. 1838	x	Eliade (1965)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius caerulescens</i> (Schaeff.) Fr. 1838 (<i>Phlegmacium caerulescens</i> (Schaeff.) Wünsche 1877)	x	Eliade (1965)	NA	
<i>Cortinarius caesiophylloides</i> Kytöv., Liimat., Niskanen, Brandrud & Frøslev 2014 (<i>Thaxterogaster caesiophylloides</i> (Kytöv., Liimat., Niskanen, Brandrud & Frøslev) Niskanen & Liimat. 2022)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius caesiostramineus</i> Rob. Henry 1939	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius cagei</i> Melot 1990	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius callisteus</i> (Fr.) Fr. 1838 (<i>Aureonarius callisteus</i> (Fr.) Niskanen & Liimat. 2022)	x	Popovici (1903)	NA	
<i>Cortinarius calochrous</i> (Pers.) Gray 1821 (<i>Calonarius calochrous</i> (Pers.) Niskanen & Liimat. 2022)	x	Eliade (1965)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius camphoratus</i> (Fr.) Fr. 1838	x	Bellù <i>et al.</i> (2019)	x	Szabó <i>et al.</i> (2023)

Species name	Morph.	References	Molec.	References
<i>Cortinarius caninus</i> (Fr.) Fr. 1838	x	Bellù <i>et al.</i> (2019)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius caperatus</i> (Pers.) Fr. 1838	x	Bellù <i>et al.</i> (2019)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius castaneus</i> (Bull.) Fr. 1838	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius catharinae</i> Consiglio 1997 (<i>Calonarius catharinae</i> (Consiglio) Niskanen & Liimat. 2022)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius chrysolitus</i> Kauffman 1915	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius cinereobrunneolus</i> Chevassut & Rob. Henry 1982	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius cinnabarinus</i> Fr. 1838	x	Eliade (1965)	NA	
<i>Cortinarius cinnamomeoluteus</i> P.D. Orton 1960	x	Czihac and Szabó (1975)	NA	
<i>Cortinarius cinnamomeus</i> (L.) Gray 1821	x	Eliade (1965)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius cinnamoviolaceus</i> M.M. Moser (1968)	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius citrinofulvescens</i> M.M. Moser 1983	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius citrinus</i> J.E. Lange ex P.D. Orton 1960	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius cliduchus</i> Secr. ex Fr. 1838 (<i>Phlegmacium cliduchum</i> (Secr. ex Fr.) Ricken 1912)	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius claricolor</i> (Fr.) Fr. 1838 (<i>Phlegmacium claricolor</i> (Fr.) A. Blytt 1904)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius collinitus</i> (Sowerby) Gray 1821	x	Eliade (1965)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius collocandoides</i> Reumaux 2009 (<i>Thaxterogaster</i> <i>collocandoides</i> (Reumaux) Niskanen & Liimat. 2022)	x	Bellù <i>et al.</i> (2019)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius colymbadinus</i> Fr. 1838	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius corrosus</i> Fr. 1838 (<i>Calonarius corrosus</i> (Fr.) Niskanen & Liimat. 2022)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius cotoneus</i> Fr. 1838	x	Tănase and Pop (2001)	NA	
<i>Cortinarius crassus</i> Fr. 1838	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius croceus</i> (Schaeff.) Gray 1821	x	Eliade (1965), Bellù <i>et al.</i> (2019)	x	Szabó <i>et al.</i> (2023)

CORTINARIUS CHECKLIST AND DISTRIBUTION IN ROMANIA

Species name	Morph.	References	Molec.	References
<i>Cortinarius cucumisporus</i> M.M. Moser 1968 (<i>Cortinarius diasemospermus</i> var. <i>leptospermus</i> H. Lindstr. 1998)	x	Bellù <i>et al.</i> (2019), as <i>C. diasemospermus</i> var. <i>leptospermus</i>	NA	
<i>Cortinarius crystallinus</i> Fr. 1838	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius cumatilis</i> Fr. 1838 (<i>Phlegmacium cumatile</i> (Fr.) Ricken 1912)	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius cupreorufus</i> Brandrud 1994 (<i>Calonarius cupreorufus</i> (Brandrud) Niskanen & Liimat. 2022)	x	Eliade (1965), as <i>C. orichalceus</i>	NA	
<i>Cortinarius cyaneus</i> (Bres.) M.M. Moser 1967	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius cyanites</i> Fr. 1838	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius cypriacus</i> Fr. 1838	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius cyanopus</i> Secr. ex Fr. 1838	x	Eliade (1965)	NA	
<i>Cortinarius damascenus</i> Fr. 1838	x	László (1972)	NA	
<i>Cortinarius daulnoyae</i> (Quél.) Sacc. 1910 (<i>Phlegmacium daulnoyae</i> (Quél.) Niskanen & Liimat. 2022)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius deceptivus</i> Kauffman 1905	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius decoloratus</i> (Fr.) Fr. 1838	x	Eliade (1965)	NA	
<i>Cortinarius decumbens</i> (Pers.) Fr. 1838	x	Eliade (1965)	NA	
<i>Cortinarius delibutus</i> Fr. 1838	x	Bellù <i>et al.</i> (2019)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius delibutus</i> aff.	x	Szabó <i>et al.</i> (2023), as <i>C. delibutus</i> 2	x	Szabó <i>et al.</i> (2023), as <i>C. delibutus</i> 2
<i>Cortinarius diasemospermus</i> Lamoure 1978	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius dibaphus</i> Fr. 1838 (<i>Calonarius dibaphus</i> (Fr.) Niskanen & Liimat. 2022)	x	Tănase and Pop (2001)	NA	
<i>Cortinarius duracinus</i> Fr. 1838	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius eburneus</i> (Velen.) Rob. Henry ex Bon 1958	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius elatior</i> Fr. 1838	x	Tănase and Chifu (2000)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius elegantior</i> (Fr.) Fr. 1838 (<i>Calonarius elegantior</i> (Fr.) Niskanen & Liimat. 2022)	x	Pop <i>et al.</i> (1999)	x	Szabó <i>et al.</i> (2023)

Species name	Morph.	References	Molec.	References
<i>Cortinarius elegantissimus</i> Rob. Henry 1943 (<i>Calonarius elegantissimus</i> (Rob. Henry) Niskanen & Liimat. 2022)	x	Bellù <i>et al.</i> (2019)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius eliae</i> Bidaud, Moëgne-Locc. & Reumaux 1996 (<i>Phlegmacium eliae</i> (Bidaud, Moëgne-Locc. & Reumaux) Niskanen & Liimat. 2022)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius emunctus</i> Fr. 1838	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius erythrinus</i> (Fr.) Fr. 1838	x	Sălăgeanu (1966)	NA	
<i>Cortinarius eufulmineus</i> Rob. Henry 1952	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius evernius</i> (Fr.) Fr. 1838	x	Eliade (1965)	NA	
<i>Cortinarius flavovirens</i> Rob. Henry 1939	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius flexipes</i> (Pers.) Fr. 1838	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius fraudulentus</i> Britzelm. 1885 (<i>Phlegmacium fraudulentum</i> (Britzelm.) Niskanen & Liimat. 2022)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius fulgens</i> Fr. 1838	x	Eliade (1965)	NA	
<i>Cortinarius fulminoides</i> (M.M. Moser) M.M. Moser 1967	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius fulvescens</i> Fr. 1838	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius fulvo-ochraceus</i> Rob. Henry 1943 (<i>Thaxterogaster fulvo-ochraceus</i> (Rob. Henry) Niskanen & Liimat. 2022)	x	Brandrud <i>et al.</i> (2018b)	x	Brandrud <i>et al.</i> (2018b)
<i>Cortinarius gallurae</i> D. Antonini, M. Antonini & Consiglio 2005	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius geniculatus</i> Bidaud 2014	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius gentilis</i> (Fr.) Fr. 1838	x	Eliade (1965)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius glaucoprasinus</i> (M.M. Moser) M.M. Moser 1967	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius glaucopus</i> (Schaeff.) Gray 1821 (<i>Phlegmacium glaucopus</i> (Schaeff.) Wünsche 1877)	x	Eliade (1965)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius glaucopus</i> aff.	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius glaucopus</i> var. <i>olivaceus</i> (M.M. Moser) Quadr. 1985 (<i>Phlegmacium glaucopus</i> var. <i>olivaceum</i> M.M. Moser 1960)	x	Bellù <i>et al.</i> (2019)	NA	

CORTINARIUS CHECKLIST AND DISTRIBUTION IN ROMANIA

Species name	Morph.	References	Molec.	References
<i>Cortinarius hadrocroceus</i> Ammirati, Niskanen, Liimat. & Bojantchev 2014	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius hemitrichus</i> (Pers.) Fr. 1838	x	Lupoi (1965)	NA	
<i>Cortinarius hercynicus</i> (Pers.) M.M. Moser 1967	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius hillieri</i> Rob. Henry 1938	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius hinnuleus</i> Fr. 1838	x	Eliade (1965)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius holoxanthus</i> (M.M. Moser & I. Gruber) Nezdobjm. 1980	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius humicola</i> (Quél.) Maire 1911	x	Eliade (1965)	NA	
<i>Cortinarius huronensis</i> Ammirati & A.H. Sm. 1972	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius turgidoides</i> Rob. Henry 1981	x	Szabó <i>et al.</i> (2023), as <i>C. hydrotelamonioide</i> ss	x	Szabó <i>et al.</i> (2023), as <i>C. hydrotelamonioide</i> s
<i>Cortinarius iliopodius</i> (Bull.) Fr. 1838	x	Czihac and Szabó (1975)	NA	
<i>Cortinarius illibatus</i> Fr. 1838	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius illuminus</i> Fr. 1838	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius imbutus</i> Fr. 1838	x	Popovici (1903)	NA	
<i>Cortinarius incognitus</i> Ammirati & A.H. Sm. 1972	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius infractus</i> (Pers.) Fr. 1838	x	Eliade (1965)	NA	
<i>Cortinarius ionochlorus</i> Maire 1937 (<i>Calonarius ionochlorus</i> (Maire) Niskanen & Liimat. 2022)	x	Bohlin (2003)	NA	
<i>Cortinarius inolens</i> (H. Lindstr.) Bidaud 2010	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius isabellinus</i> (Batsch) Fr. 1838	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius kristinae</i> Brandrud 2017 (<i>Calonarius kristinae</i> (Brandrud) Niskanen & Liimat. 2022)	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius lacustris</i> Moënne-Loec. & Reumaux 1997	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius largus</i> Fr. 1838 (<i>Phlegmacium largum</i> Fr. 1877)	x	Eliade (1965)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius latus</i> (Pers.) Fr. 1838	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius lebretonii</i> Quél. 1880	x	Bellù <i>et al.</i> (2019)	NA	

Species name	Morph.	References	Molec.	References
<i>Cortinarius leproleptopus</i> Chevassut & Rob. Henry 1988	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius leucopus</i> (Bull.) Fr. 1838	x	Eliade (1965)	NA	
<i>Cortinarius lilacinovelatus</i> Reumaux & Ramm 2001 (<i>Calonarius lilacinovelatus</i> (Reumaux & Ramm) Niskanen & Liimat. 2022)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius limonius</i> (Fr.) Fr. 1838 (<i>Aureonarius limonius</i> (Fr.) Niskanen & Liimat. 2022)	x	Eliade (1965)	NA	
<i>Cortinarius lucorum</i> (Fr.) E. Berger 1846	x	Tănase and Chifu (2000)	NA	
<i>Cortinarius luridus</i> Rob. Henry 1969	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius lustrabilis</i> Moëgne-Locc. 2000 (<i>Mystinarius lustrabilis</i> (Moëgne-Locc.) Niskanen & Liimat. 2022)	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius magicus</i> aff.	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius magicus</i> Eichhorn 1967 (<i>Phlegmacium magicum</i> (Eichhorn) Niskanen & Liimat. 2023)	x	Bellù <i>et al.</i> (2019)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius malicorius</i> Fr. 1838	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius masseei</i> Bidaud, Moëgne-Locc. & Reumaux 1993	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius melanotus</i> Kalchbr. 1874	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius mucosus</i> (Bull.) J. Kickx f. 1867	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius multicolor</i> M.M. Moser 1953	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius multiformis</i> Fr. 1838 (<i>Thaxterogaster multiformis</i> (Fr.) Niskanen & Liimat. 2022)	x	Eliade (1965)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius napus</i> Fr. 1838 (<i>Calonarius napus</i> (Fr.) Niskanen & Liimat. 2022)	x	Eliade (1965)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius neofurvolaeus</i> Kytöv., Niskanen, Liimat. & H. Lindstr. 2005	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius nigroscupidatus</i> Kauffman 1923	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius occidentalis</i> A.H. Sm. 1939 (<i>Thaxterogaster occidentalis</i> (A.H. Sm.) Niskanen & Liimat., in Liimatainen, Kim, Pokorny, Kirk, Dentinger & Niskanen 2022)	x	Pál-Fám <i>et al.</i> (2023)	NA	

CORTINARIUS CHECKLIST AND DISTRIBUTION IN ROMANIA

Species name	Morph.	References	Molec.	References
<i>Cortinarius ochraceopallescens</i> Moënné-Locc. & Reumaux 2001 (<i>Calonarius ochraceopallescens</i> (Moënné-Locc. & Reumaux) Niskanen & Liimat. 2022)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius ochroleucus</i> (Schaeff.) Fr. 1838 (<i>Thaxterogaster</i> <i>ochroleucus</i> (Schaeff.) Niskanen & Liimat. 2022)	x	Eliade (1965)	NA	
<i>Cortinarius odoratus</i> (Joguet ex M.M. Moser) M.M. Moser 1967 (<i>Calonarius odoratus</i> (Joguet ex M.M. Moser) Niskanen & Liimat. 2022)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius odorifer</i> Britzelm. 1885	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius olearioides</i> Rob. Henry 1987 (<i>Calonarius olearioides</i> (Rob. Henry) Niskanen & Liimat. 2022)	x	Bucşa (2007)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius olidoamarus</i> A. Favre 1986 (<i>Phlegmacium olidoamarum</i> (A. Favre) Niskanen & Liimat. 2022)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius ominosus</i> Bidaud 1994	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius orellanus</i> Fr. 1838	x	Ciortan (2013b)	NA	
<i>Cortinarius orichalceus</i> (Batsch) Fr. 1838	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius pallidostriatus</i> Rob. Henry 1968	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius pelerinii</i> Bellanger, Carteret & Reumaux 2013	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius percomis</i> Fr. 1838 (<i>Phlegmacium percome</i> (Fr.) A. Blytt 1905)	x	Tănase and Pop (2001)	NA	
<i>Cortinarius persoonianus</i> Bidaud 2009	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius pholideus</i> (Lilj.) Fr. 1838	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius pilatii</i> Svrček 1968	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius praestans</i> (Cordier) Gillet 1876 (<i>Phlegmacium praestans</i> (Cordier) M.M. Moser 1960)	x	Eliade (1965)	NA	
<i>Cortinarius prasinus</i> (Schaeff.) Fr. 1838 (<i>Calonarius prasinus</i> (Schaeff.) Niskanen & Liimat. 2022)	x	Eliade (1965)	NA	
<i>Cortinarius pruinatus</i> Bidaud, Moënné-Locc. & Reumaux 1993	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)

Species name	Morph.	References	Molec.	References
<i>Cortinarius pseudodaulnoyae</i> Rob. Henry & Ramm 1991 (<i>Phlegmacium pseudodaulnoyae</i> (Rob. Henry & Ramm) Niskanen & Liimat. 2022)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius pseudofervidus</i> Niskanen, Liimat., Ammirati & Kytöv. 2014	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius pseudonaevosus</i> Rob. Henry 1957 (<i>Phlegmacium pseudonaevosum</i> (Rob. Henry) Brandrud, Dima, Saar & Schmidt-Stohn 2022)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius purpurascens</i> Fr. 1838 (<i>Thaxterogaster purpurascens</i> (Fr.) Niskanen & Liimat. 2022)	x	Eliade (1965)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius purpureus</i> (Bull.) Bidaud, Moëgne-Loec. & Reumaux 1994	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius quarciticus</i> H. Lindstr. 1994	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius radicosissimus</i> Moëgne-Loec. 1997	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius renidens</i> Fr. 1838 (<i>Hygromarius renidens</i> (Fr.) Niskanen & Liimat. 2022)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius riederi</i> (Weinm.) Fr. 1838 (<i>Thaxterogaster riederi</i> (Weinm.) Niskanen & Liimat. 2022)	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius rigens</i> (Pers.) Fr. 1838	x	László (1972)	NA	
<i>Cortinarius rubellus</i> Cooke 1887	x	Chinan (2010)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius rubricosus</i> (Fr.) Fr. 1838	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius rubrophyllus</i> (Moëgne-Loec.) Liimat., Niskanen, Ammirati & Dima 2014	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius rufoallutus</i> Rob. Henry ex Bidaud & Reumaux 2006 (<i>Thaxterogaster rufoallutus</i> (Rob. Henry ex Bidaud & Reumaux) Niskanen & Liimat. 2022)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius rufo-olivaceus</i> (Pers.) Fr. 1838 (<i>Calonarius rufo-olivaceus</i> (Pers.) Niskanen & Liimat 2022)	x	Eliade (1965)	NA	
<i>Cortinarius rusticus</i> P. Karst. 1883	x	Pál-Fám <i>et al.</i> (2023)	NA	

CORTINARIUS CHECKLIST AND DISTRIBUTION IN ROMANIA

Species name	Morph.	References	Molec.	References
<i>Cortinarius saginus</i> (Fr.) Fr. 1838 (<i>Phlegmacium saginum</i> (Fr.) Ricken 1912)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius salor</i> Fr. 1838	x	Eliade (1965)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius sanguineus</i> (Wulfen) Gray 1821	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius saniosus</i> (Fr.) Fr. 1838	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius saporatus</i> Britzelm. 1897 (<i>Calonarius saporatus</i> (Britzelm.) Niskanen & Liimat. 2022)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius scandens</i> Fr. 1838	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius scaurocaninus</i> Chevassut & Rob. Henry 1982 (<i>Phlegmacium scaurocaninum</i> (Chevassut & Rob. Henry) Niskanen & Liimat. 2022)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius scaurus</i> (Fr.) Fr. 1838 (<i>Thaxterogaster scaurus</i> (Fr.) Niskanen & Liimat. 2022)	x	Eliade (1965)	NA	
<i>Cortinarius semisanguineus</i> (Fr.) Gillet 1876	x	Eliade (1965), Bellù <i>et al.</i> (2019)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius semivelatus</i> Rob. Henry 1970	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius sodagnitus</i> Rob. Henry 1935 (<i>Calonarius sodagnitus</i> (Rob. Henry) Niskanen & Liimat. 2022)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius spadicellus</i> Brandrud 1997 (<i>Phlegmacium spadicellum</i> M.M. Moser 1960)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius sphagnophilus</i> Peck 1878 (<i>Thaxterogaster sphagnophilus</i> (Peck) Niskanen & Liimat. 2022)	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius splendens</i> Rob. Henry 1936	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius spilomeus</i> (Fr.) Fr. 1863	x	Bellù <i>et al.</i> (2019)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius stillatitius</i> Fr. 1838	x	Popovici (1903)	NA	
<i>Cortinarius subargyronotus</i> Niskanen, Liimat. & Kytöv. 2014	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius subdecolorans</i> M. Langl. & Reumaux 2000 (<i>Phlegmacium subdecolorans</i> (M. Langl. & Reumaux) Niskanen & Liimat. 2022)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)

Species name	Morph.	References	Molec.	References
<i>Cortinarius suberi</i> Soop 1990	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius subferrugineus</i> (Batsch) Fr. 1838	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius subfoetens</i> M.M. Moser & McKnight 1995 (<i>Phlegmacium subfoetens</i> (M.M. Moser & McKnight) Niskanen & Liimat. 2022)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius subfulgens</i> P.D. Orton 1960	x	Elekes <i>et al.</i> (2014)	NA	
<i>Cortinarius subllacinopes</i> aff.	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius subparvannulatus</i> Moënné-Locc. & Fillion 2010	x	Bellù <i>et al.</i> (2019)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius subporphyropus</i> Pilát 1954 (<i>Thaxterogaster subporphyropus</i> (Pilát) Niskanen & Liimat. 2022)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius subpurpurascens</i> (Batsch) E. Berger 1846 (<i>Thaxterogaster subpurpurascens</i> (Batsch) Niskanen & Liimat. 2022)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius subtortus</i> (Pers.) Fr. 1838	x	Bellù <i>et al.</i> (2019)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius sulfurinus</i> Quél. 1884 (<i>Calonarius sulfurinus</i> (Quél.) Niskanen & Liimat. 2022)	x	Bellù <i>et al.</i> (2019)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius tabularis</i> (Fr.) Fr. 1838	x	Tănase and Chifu (2000)	NA	
<i>Cortinarius talimultiformis</i> Kytöv., Liimat., Niskanen, A.F.S. Taylor & Sesli 2014 (<i>Thaxterogaster talimultiformis</i> (Kytöv., Liimat., Niskanen, A.F.S. Taylor & Sesli) Niskanen & Liimat. 2022)	x	Bellù <i>et al.</i> (2019)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius talus</i> Fr. 1838 (<i>Thaxterogaster talus</i> (Fr.) Niskanen & Liimat. 2022)	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius testaceomicaceus</i> Bidaud 2014	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius tirolianus</i> Bidaud, Moënné-Locc. & Reumaux 2005 (<i>Phlegmacium tirolianum</i> (Bidaud, Moënné-Locc. & Reumaux) Niskanen & Liimat. 2022)	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius tofaceus</i> Fr. 1838 (<i>Aureonarius tofaceus</i> (Fr.) Niskanen & Liimat., in Liimatainen, Kim, Pokorny, Kirk, Dentinger & Niskanen 2022)	x	Pál-Fám <i>et al.</i> (2023)	NA	

CORTINARIUS CHECKLIST AND DISTRIBUTION IN ROMANIA

Species name	Morph.	References	Molec.	References
<i>Cortinarius torvus</i> (Fr.) Fr. 1838	x	Eliade (1965)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius traganus</i> (Fr.) Fr. 1838	x	Eliade (1965)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius triformis</i> Fr. 1838	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius trivialis</i> J.E. Lange 1940	x	Popovici (1903)	NA	
<i>Cortinarius trivialis</i> aff.	x	Szabó <i>et al.</i> (2023), as <i>C. trivialis</i> 2	x	Szabó <i>et al.</i> (2023), as <i>C. trivialis</i> 2
<i>Cortinarius tubarius</i> Ammirati & A.H. Sm. 1972	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius turbinatus</i> (Bull.) Fr. 1838	x	Eliade (1965)	NA	
<i>Cortinarius turgidus</i> Fr. 1838	x	Bellù <i>et al.</i> (2019)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius turmalis</i> Fr. 1838 (<i>Thaxterogaster turmalis</i> (Fr.) Niskanen & Liimat. 2022)	x	Eliade (1965)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius ultrodistortus</i> Rob. Henry & Vagnet 1992	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius uraceus</i> Fr. 1838	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius uraceonemoralis</i> Niskanen, Liimat., Dima, Kytöv., Bojantchev & H. Lindstr. 2014	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius urbicus</i> (Fr.) Fr. 1838	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius variegator</i> (Pers.) Fr. 1838 (<i>Phlegmacium variegator</i> (Pers.) Wünsche 1877)	x	Eliade (1965)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius varius</i> (Schaeff.) Fr. 1838 (<i>Phlegmacium varium</i> (Schaeff.) Wünsche 1877)	x	Eliade (1965)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius venetus</i> (Fr.) Fr. 1838	x	Eliade (1965)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius vibratilis</i> (Fr.) Fr. 1838 (<i>Thaxterogaster vibratilis</i> (Fr.) Niskanen & Liimat. 2022)	x	Eliade (1965)	NA	
<i>Cortinarius vibratilis</i> aff.	x	Szabó <i>et al.</i> (2023)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius violaceocinereus</i> (Pers.) Fr. 1838	x	Pál-Fám <i>et al.</i> (2023)	NA	
<i>Cortinarius violaceus</i> (L.) Gray 1821	x	Eliade (1965)	x	Szabó <i>et al.</i> (2023)
<i>Cortinarius vulpinus</i> (Velen.) Rob. Henry 1947 (<i>Phlegmacium</i> <i>vulpinum</i> (Velen.) Niskanen & Liimat. 2022)	x	Bellù <i>et al.</i> (2019)	NA	
<i>Cortinarius xanthochlorus</i> Rob. Henry 1966 (<i>Calonarius</i> <i>xanthochlorus</i> (Rob. Henry) Niskanen & Liimat. 2022)	x	Bellù <i>et al.</i> (2019)	x	Szabó <i>et al.</i> (2023)

Table legend: x = available; NA = not available.

***Cortinarius* sample distribution based on literature review**

After analyzing the spatial distribution of the recorded samples in Romania using a Kernel Density Estimate (KDE) of site coordinates projected in EPSG:3857, two major hotspots of collection activity become evident (Fig. 2). The KDE is visualized as filled contours, where the color gradient from blue to orange indicates increasing density of sampling sites, while individual locations are marked as black points. The results reveal two dominant clusters: one in the Apuseni Mountains and another in the Transylvanian Basin. These patterns reflect the research focus of previous studies, with the Transylvanian Basin being intensively surveyed during multiple mycological camps and congresses led by Pál-Fám and collaborators, while the Apuseni region was extensively explored by Szabó and her team as part of their molecular taxonomic investigations.

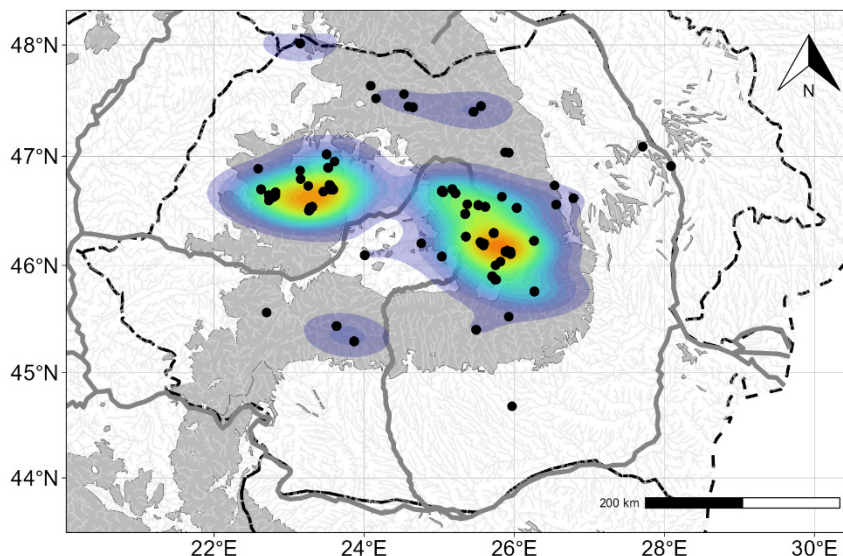


Figure 2. *Cortinarius* sample distribution based on literature review.

The map was made in R (v4.4.3) using the ggplot2 (v3.5.1), sf (1.0-19) and maptiles (0.9.0) packages.

Conclusions

This first comprehensive checklist of *Cortinarius* sensu lato in Romania documents 231 taxa. All species are supported by morphological records, with 110 have also confirmed by molecular analyses, reflecting the growing role of DNA-based methods in regional cortinarioid research. The remaining 121 taxa

are still supported exclusively by morphology, underscoring the need for further molecular validation. Several unidentified species were documented: *Cortinarius* aff. *delibutus*, *C.* aff. *glaucopus*, *C.* aff. *magicus*, *C.* aff. *sublilacinopes*, *C.* aff. *trivialis*, and *C.* aff. *vibratilis*. These taxa differ from related species not only in their morphological appearance but also in their molecular characteristics, indicating that further taxonomic and nomenclatural investigations are needed to clarify their taxonomic status and name them properly.

These findings highlight Romania as a region of considerable cortinarioid diversity, though it remains underrepresented in global sequence repositories. The current geographic bias toward the Apuseni Mountains and the Transylvanian Basin emphasizes the need for systematic surveys in underexplored regions. Future research integrating morphology, ecology, and molecular systematics will be essential to refine species boundaries, strengthen conservation assessments, and fully document the ecological role of *Cortinarius* in Romanian forests

Acknowledgements. Grammatical corrections and language polishing were performed with the assistance of ChatGPT (OpenAI, 2025). No content generation or interpretation was carried out by the AI tool.

References

- Barr, D.J.S. (2001). Chytridiomycota. *Systematics and Evolution: Part A, Second Edition*, 93–112. http://doi.org/10.1007/978-3-662-10376-0_5
- Bellù, F., Zsigmond Gy. & Szász B. (2019). Liste der Cortinarienfunde während den Journées Européennes du Cortinaire in Bálványos. *Journal des JEC* 81, 80.
- Berbee, M.L. & Taylor, J.W. (2001). Fungal molecular evolution: gene trees and geologic time. *Systematics and Evolution*, 229–245. http://doi.org/10.1007/978-3-662-10189-6_10
- Bidaud, A.P., Moëgne-Loccoz, P. & Reumaux, P. (1994). *Atlas des Cortinaires: Clé générale des sous-genres, sections, sous-sections et séries*. Annecy, France: Editions Fédération Mycologique Dauphiné-Savoie.
- Bidaud, A., Loizides, M., Armada, F., Reyes, J.D.D., Carteret, X., Corriol, G., Consiglio, G., Reumaux, P., Bellanger, J.M. (2021). *Cortinarius* subgenus *Leprocye* in Europe: expanded Sanger and next generation sequencing unveil unexpected diversity in the Mediterranean. *Persoonia*. 46, 188–215 <https://doi.org/10.3767/persoonia.2021.46.07>
- Bîrsan, C., Tănase, C. & Mardari, C. (2013). Variation of macromycetes species composition in two forest habitats from Giumalău Massif (Eastern Carpathians, Romania). *Journal of Plant Development* 20(1), 79–103.
- Bohlin, A., Senn-Irlet, B. (2003). European Council for the Conservation of Fungi 13 – December 2003.

- Bontea, V. (1985). Ciuperci parazite și saprofite din România, vol. 1. *Academia Republicii Socialiste Romania*.
- Bontea, V. (1986). Ciuperci parazite și saprofite din România, vol. 2. *Academia Republicii Socialiste Romania*.
- Brandrud, T.E., Lindström, H., Marklund, H., Melot, J. & Muskos, S. (1990). *Cortinarius*, Flora Photographica, vol. 1., *Cortinarius HB*. Matfors, Sweden.
- Brandrud, T.E., Lindström, H., Marklund, H., Melot, J. & Muskos, S. (1992). *Cortinarius*, Flora Photographica, vol. 2. *Cortinarius HB*. Matfors, Sweden
- Brandrud, T.E., Lindström, H., Marklund, H., Melot, J. & Muskos, S. (1998). *Cortinarius*, Flora Photographica. vol. 4. *Cortinarius HB*. Matfors, Sweden
- Brandrud, T.E. (1996). *Cortinarius* subgenus Phlegmacium section Phlegmacium in Europe: descriptive part. *Edinburgh Journal of Botany* 53(3): 331–400. <https://doi.org/10.1017/S0960428600003772>
- Brandrud, T.E., Schmidt-Stohn, G. & Dima, B. (2019). *Cortinarius hildegardiae* and *C. mariekristinae* spp. nov., two new species in the Phlegmacioid clade Humolentes (Sect. Calochroi s. l.). *Sydowia-Horn* 71(115), <https://doi.org/10.12905/0380.sydowia71-2019-0115>
- Brandrud, T.E. & Dima, B. (2014). *Cortinarius* subgenus Phlegmacium section Multiformes in Europe. *J. Des J.E.C* 16, 162–199.
- Brandrud, T.E., Schmidt-Stohn, G., Liimatainen, K., Niskanen, T., Frøslev, T.G., Soop, K., Bojantechev, D., Kytövuori, I., Stjernegaard Jeppsen, T., Bellù, F., Saar, G., Oertel, B., Ali, T., Thines, M. & Dima, B. (2018a). *Cortinarius* sect. Riederi: taxonomy and phylogeny of the new section with European and North American distribution. *Mycological Progress* 17(12), 1323–1354. <http://dx.doi.org/10.1007/s11557-018-1443-0>
- Brandrud, T.E., Frøslev, T.G. & Dima, B. (2018b). Rare, whitish–pale ochre *Cortinarius* species of sect. Calochroi from calcareous Tilia forests in South East Norway. *Agarica* 38(0349), 3–20. <https://hdl.handle.net/11250/2503628>
- Brandrud, T.E., Lindström, H., Marklund, H., Melot, J. & Muskos, S. (1995). *Cortinarius* Flora Photographica. Ed. R. Watling. *Edinburgh*: Royal Botanic Garden.
- Bucșa, L. (2007). Macromycetes of the Breite Nature Reserve of ancient oaks (Transylvania, Romania). *Transylv. Rev. Syst. Ecol. Res* 4, 33.
- Chifu, T., Toma, M. & Dăscălescu, D. (1971). Contribuții la cunoașterea macromicetelor din Moldova. *Iași: Com. Șt., Inst. Pedag.*
- Chinan, V. (2010). Macrofungi from „Tinovul de la Românești” peat bog (Dornelor Depression, Romania). *AAB Bioflux* 2(1), 65–70.
- Chinan, V. & Manzu, C. (2014). Macrofungal diversity of a peat bog from Dorna Depression (Eastern Carpathians, Romania). *Analele Științifice ale Universității “Al. I. Cuza” Iași s. II a Biologie vegetală* 60(2), 43–52.
- Chinan, V. & Tănase, C. (2008). Coenological observations referring to macromycetes from peat bogs situated in Eastern Carpathians (Romania). 8th International Scientific Conference on Modern Management of Mine Producing, Geology and Environmental Protection, *SGEM* 2, 83–90.

- Ciortan, I. 2013a. Contributions to the mycobiota knowledge of spruce forests from Obârșia Lotrului Health Resort (Romania). *Forestry and Biotechnology* 17(4), 16–21.
- Ciortan, I. (2013b). The taxonomic diversity of the macromycetes from Căpățânii Mountains (Romania). *Forestry and Biotechnology* 17(1), 41–50.
- Czihac, J. & Szabó, J. (1975). Heil- und Nahrungsmittel, Farbstoffe, Nutz- und Hausgeräte welche Ost-Romänien, Moldauer und Valachen aus dem Pflanzenreiche gewinnen. *Flora oder allgemeine botanische Zeitung* XXI(20), 308–315.
- Dima, B., Liimatainen, K., Niskanen, T., Kytövuori, I. & Bojantchev, D. (2014). Two new species of *Cortinarius*, subgenus *Telamonia*, sections *Colymbadini* and *Uracei*, from Europe. *Mycological Progress* 13(3), 867–879.
<https://doi.org/10.1007/s11557-014-0970-6>
- Dima, B., Lindström, H., Liimatainen, K., Olson, Å., Soop, K., Kytövuori, I., Dahlberg, A. & Niskanen, T. (2016). Typification of Friesian names in *Cortinarius* sections *Anomali*, *Spilomei*, and *Bolares*, and description of two new species from Northern Europe. *Mycological Progress* 15(9), 903–919.
<http://dx.doi.org/10.1007/s11557-016-1217-5>
- Elekes, C.C. & Busuioc, G. (2010). The mycoremediation of metals polluted soils using wild growing species of mushrooms. In: *International Conference on Engineering Education and International Conference on Education and Educational Technologies – Proceedings* 36–39.
- Elekes, C.C., Busuioc, G. & Dumitriu, I. (2014). Bioaccumulation and translocation factors of some wild growing mushrooms species of *Cortinarius* genus. 464–468.
- Eliade, E. 1965. *Conspectul macromicetelor din România*. București: Lucrările Grădinii Botanice din București.
- Fries, E.M. (1838). *Epicrisis Systematis Mycologici seu Synopsis Hymenomycetum, Typographia Academica*. Uppsala, Sweden.
- Fries, E.M. 1821. *Systema Mycologicum*. Lundae: Ex Officina Berlingiana. Uppsala, Sweden.
- Frøslev, T. G., Jeppesen, T.S. and B. Dima. 2015. *Cortinarius koldingensis*—a new species of *Cortinarius*, subgenus *Phlegmacium* related to *Cortinarius sulfurinus*. *Mycological Progress* 14(73).
- Frøslev, T. G., Jeppesen, T. S., Læssøe, T. & Kjølner, R. (2007). Molecular phylogenetics and delimitation of species in *Cortinarius* section *Calochroi* (Basidiomycota, Agaricales) in Europe. *Molecular Phylogenetics and Evolution* 44(1), 217–227.
<https://doi.org/10.1016/j.ympev.2006.11.013>
- Frøslev, T.G., Brandrud, T.E. & Dima, B. (2017). *Cortinarius stjernegaardii* and *C. kristinae* (Basidiomycota, Agaricales), two new European species with a mainly northern distribution. *Mycological Progress* 16(2), 145–153.
<http://dx.doi.org/10.1007/s11557-016-1264-y>
- Fuss, M. (1866). *Flora Transilvaniae*, V. Sibiu: *Typis Haeredum Georgii de Closius*, Sibiu.
- Gallone, B., Kuyper, T.W. & Nuytinck, J. (2024). The genus *Cortinarius* should not (yet) be split. *IMA Fungus* 15(1). <https://doi.org/10.1186/s43008-024-00159-4>

- Garnica, S., Weiß, M., Oertel, B., Ammirati, J. & Oberwinkler, F. (2009). Phylogenetic relationships in *Cortinarius*, section Calochroi, inferred from nuclear DNA sequences. *BMC Evolutionary Biology* 9(1), 1–17. <https://doi.org/10.1186/1471-2148-9-1>
- Garnica, S., Weiß, M., Oertel, B. & Oberwinkler, F. (2003). Phylogenetic relationships of European Phlegmacium species (*Cortinarius*, Agaricales). *Mycologia* 95(6), 1155–1170. <https://doi.org/10.1080/15572536.2004.11833025>
- Garnica, S., Weiß, M., Oertel, B. & Oberwinkler, F. (2005). A framework for a phylogenetic classification in the genus *Cortinarius* (Basidiomycota, Agaricales) derived from morphological and molecular data. *Canadian Journal of Botany* 83(11), 1457–1477. <https://doi.org/10.1139/b05-107>
- Garnica, S., Spahn, P., Oertel, B., Ammirati, J. & Oberwinkler, F. (2011). Tracking the evolutionary history of *Cortinarius* species in section Calochroi, with transoceanic disjunct distributions. *BMC Evolutionary Biology* 11(1), 1–19.
- Garrido-Benavent, I., Ballara, J. & Mahiques, R. (2015). New insights into subg. Phlegmacium sect. Calochroi: adding morphological and molecular data from Mediterranean representatives, with special regard to *Cortinarius prasinus*, *C. natalis* and *C. murellensis* species complexes. *Journal des JEC* 17, 38–78.
- Kirk, P. M., Cannon, P.F., Minter, D.W. & Stalpers, J.A. (2008). Dictionary of the Fungi, 10th edn. CAB International. Wallingford, UK.
- László, K. 1972. Noi contribuții la cunoașterea macromicetelor din R.S. România. *Aluta* 41–60.
- Li, Y., Steenwyk, J.L., Chang, Y., Wang, Y., James, T.Y., Stajich, J.E., Spatafora, J.W., Groenewald, M., Dunn, C.W., Hittinger, C.T., Shen, X.X. & Rokas, A. (2021). A genome-scale phylogeny of the kingdom Fungi. *Current Biology* 31(8), 1653–1665.e5. <https://doi.org/10.1016/j.cub.2021.01.074>
- Liimatainen, K. (2013). Towards a better understanding of the systematics and diversity of *Cortinarius*, with an emphasis on species growing in boreal and temperate zones of Europe and North America. *Faculty of Biological and Environmental Sciences Department of Biosciences Plant Biology. University of Helsinki*, Finland
- Liimatainen, K., Niskanen, T., Dima, B., Kytövuori, I., Ammirati, J.F. & Frøslev, T. G. (2014). The largest type study of Agaricales species to date: bringing identification and nomenclature of Phlegmacium (*Cortinarius*) into the DNA era. *Persoonia: Molecular Phylogeny and Evolution of Fungi* 33, 98–140. <https://doi.org/10.3767/003158514X684681>
- Liimatainen, K., Niskanen, T., Dima, B., Ammirati, B., Kirk, P.M. & Kytövuori, I. (2020). Mission impossible completed: unlocking the nomenclature of the largest and most complicated subgenus of *Cortinarius*, Telamonia, *Fungal Diversity*. <https://doi.org/10.1007/s13225-020-00459-1>
- Liimatainen, K., Kim, J.T., Pokorny, L., Kirk, P.M., Dentinger, B. & Niskanen, T. (2022). Taming the beast: a revised classification of Cortinariaceae based on genomic data: revised classification of Cortinariaceae based on genomic data. *Fungal Diversity*. <https://doi.org/10.1007/s13225-022-00499-9>

- Liu, Y. J., Rogers, S.O. & Ammirati, J.F. (1997). Phylogenetic relationships in *Dermocybe* and related *Cortinarius* taxa based on nuclear ribosomal DNA internal transcribed spacers. *Canadian Journal of Botany* 75(4), 519–532.
<https://doi.org/10.1139/b97-058>
- Lupoi, A. (1965). Materiale pentru flora micologică a Munților Lăpuș. *Contrib. Bot., Univ. Babeș-Bolyai Cluj-Napoca*: 71–74.
- Mátyus, I. (1787). Ó és Új diaetetica az az: az életnek és egészségnek fenn-tartására és gyámolgatására, Istentől adattatott nevezetesebb természeti eszközöknek való elszámolása. *Landerer, Pozsony*. <http://hdl.handle.net/123456789/191>
- Moëgne-Loccoz, P., Reumaux, P. and Bidaud, A. 1990. *Atlas des Cortinaires 1*. Annecy, France: Editions F.
- Moser, M. (1983). Die Röhlinge und Blätterpilze, Band IIb, *Kleine Kryptogamenflora*. Stuttgart, Germany
- Moser, M. & Horak, E. (1975). *Cortinarius* Fr. und nahe verwandte Gattungen. *Südamerika*. 116.
- Niskanen, T., Liimatainen, K., Kytövuori, I., Lindström, H., Dentinger, B.T.M. & Ammirati, J.F. (2016). *Cortinarius* subgenus *Callistei* in North America and Europe—type studies, diversity, and distribution of species. *Mycologia* 108(5), 1018–1027.
<https://doi.org/10.3852/16-033>
- Niskanen, T., Kytövuori, I. & Liimatainen, K. (2009). *Cortinarius* sect. *Brunnei* (Basidiomycota, Agaricales) in North Europe. *Mycological Research* 113(2), 182–206.
<https://doi.org/10.1016/j.mycres.2008.10.006>
- Niskanen, T., Kytövuori, I. & Liimatainen, K. (2011). *Cortinarius* sect. *Armillati* in Northern Europe. *Mycologia* 103(5), 1080–1101. <https://doi.org/10.3852/10-350>
- Niskanen, T., Kytövuori, I., Liimatainen, K. & Lindström, H. (2013). The species of *Cortinarius*, section *Bovini*, associated with conifers in Northern Europe. *Mycologia* 105(4), 977–993. <https://doi.org/10.3852/12-320>
- Niskanen, T., Laine, S., Liimatainen, K. & Kytövuori, I. (2012). *Cortinarius sanguineus* and equally red species in Europe with an emphasis on Northern European material. *Mycologia* 104(1), 242–253. <https://doi.org/10.3852/11-137>
- Niskanen, T., Liimatainen, K. & Kytövuori, I. (2008). Two new species in *Cortinarius* subgenus *Telamonia*, *Cortinarius brunneifolius* and *C. leiocastaneus*, from Fennoscandia (Basidiomycota, Agaricales). *Mycological Progress* 7(4), 239–24. <https://doi.org/10.5852/ejt.2024.970.2747>
- Pál-Fám, F. (1997). Adatok a Baróti-Hegység Nagygyombáinak Ismeretéhez. 2. *Clusiana*.
- Pál-Fám, F., Benedek, L., Szász, B. & Szilvássy, E. (2022). “Adatok a Gyergyói-Havasok, Görgényi-Havasok És a Hargita-Hegység Nagygyombáinak Ismeretéhez.” *Moeszia* 11–12, 53–58.
- Pál-Fám, F., Földi, F., Oross, K. & Benedek, L. (2022). Adatok Bálványos Környéke, a Szent Anna-Tó Környéke És a Lucs Nagygyombáinak Ismeretéhez. *Moeszia* 11–12, 60–71.
- Pál-Fám, F., Oross, K. & Fedor, I. (2022). Adatok Székelyvarság Környéke És a Hargita Nagygyombáinak Ismeretéhez. *Moeszia* 11–12, 89–97.
- Pál-Fám, F., Oross, K., Földi, A. & Benedek, L. (2022a). A Lápos-Vidék (Máramaros) Nagygyombáinak Ismeretéhez. *Moeszia* 11–12, 82–89.

- Pál-Fám, F., Oross, K., Földi, A. & Benedek, L. (2022b). Adatok a Görgényi- És a Gyergyói-Havasok Nagygombáinak Ismeretéhez. *Moeszia* 11–12, 71–80.
- Pál-Fám, F., Szász, B. & Benedek, L. (2023) Checklist and habitats of macrofungi of Székelyland, Transylvania, Romania. *Moeszia* 13–14, 3–76
- Peintner, U., Bougher, N.L., Castellano, M.A., Moncalvo, J.M., Moser, M.M., Trappe, J.M. & Vilgalys, R. (2001). Multiple origins of sequestrate fungi related to *Cortinarius* (Cortinariaceae). *American Journal of Botany* 88(12), 2168–79.
<https://doi.org/10.2307/3558378>
- Peintner, U., Horak, E., Moser, M.M. & Vilgalys, R. (2002). Phylogeny of *Rozites*, *Cuphocybe* and *Rapacea* inferred from ITS and LSU rDNA sequences. *Mycologia* 94(4), 620–29. <https://doi.org/10.1080/15572536.2003.11833190>
- Peintner, U., Moncalvo, J.M. & Vilgalys, R. (2004). Toward a better understanding of the infrageneric relationships in *Cortinarius* (Agaricales, Basidiomycota). *Mycologia* 96(5), 1042–58. <https://doi.org/10.1080/15572536.2005.11832904>
- Pop, A., Tănase, C., Negrean, G., Buscă, L. & Toma, D. Contribuții la studiul macromicetelor din Masivul Rarău. *Buletinul Grădinii Botanice Iași* 8, 37–44
- Popovici, A. (1903). Contribution à la flore micologique de la Roumanie. *Ann. Sci. Univ. De Jassy* 2, 31–44.
- Roskov, Y., Ower, G., Orrell, T., Nicolson, D., Bailly, N., Kirk, P.M., Bourgoin, T., DeWalt, R.E., Decock, W., Nieukerken, E., Zarucchi, J. & Penev, L. (2019). Species 2000 & ITIS Catalogue of Life, 2019 Annual Checklist. *Digital resource at www.catalogueoflife.org/annual-checklist/2019. Species 2000: Naturalis, Leiden, the Netherlands.* (2405-884X).
- Sălăgeanu, A. (1966). Macromicete Din Grădina Botanică a Universității Din Cluj. *Contribuții Botanice, Universitatea „Babeș-Bolyai” Cluj-Napoca*: 95–108.
- Sántha, T. (1999). A Székelyföld Nagygomba-Világának Kutatása. *ACTA I*, 29–48.
- Singer, R. (1986). The Agaricals in Modern Taxonomy. *Seven Koel* 1-478.
- Soop, K., Dima, B., Cooper, J.A., Park, D. & Oertel, B. (2019). A Phylogenetic Approach to a Global Supraspecific Taxonomy of *Cortinarius* (Agaricales) with an Emphasis on the Southern Mycota. *Persoonia: Molecular Phylogeny and Evolution of Fungi* 42, 261–90. <https://doi.org/10.3767/persoonia.2019.42.10>
- Suárez-Santiago, V.N., Ortega, A., Peintner, U. & López-Flores, I. (2009). Study on *Cortinarius* Subgenus *Telamonina* Section *Hydrocybe* in Europe, with Especial Emphasis on Mediterranean Taxa. *Mycological Research* 113(10), 1070–90. <https://doi.org/10.1016/j.mycres.2009.07.006>
- Szász, B. (2022). Újabb adatok Olthévíz és környéke nagygombáinak ismeretéhez II. *Moeszia* 11–12, 34–51.
- Szász, B., Benedek, L., Pál-Fám, F. & Zsigmond, Gy. (2022). A Bálványosi Európai *Cortinarius* Kongresszus alkalmával gyűjtött nagygombák jegyzéke. *Moeszia* 11–12, 7–114.
- Szabó, E., Dima, B., Dénes, A.L., Papp, V. & Keresztes, L. (2023). DNA barcoding data reveal important overlooked diversity of *Cortinarius* Ssensu Lato (Agaricales, Basidiomycota) in the Romanian Carpathians. *Diversity* 15(4), 553.
<https://doi.org/10.3390/d15040553>

- Tănase, C. & Chifu, T. 2000. Biodiversitatea speciilor de macromicete în păduri din bazinul superior al râului Jijia. *Buletinul Grădinii Botanice Iași* 9, 79–82.
- Tănase, C. & Pop, A. 2005. Red List of Romanian macrofungi species. *Bioplatform Romanian National Platform for Biodiversity, Editura Academiei Române* (ISBN 973-27-1211-2), București: 101-107.
- Todorescu, V. (1972). Macromicetele Din Munții Ciucaș. *Analele Universității București, Biologie Vegetală XXI*, 159–66.
- Vörösváry, G. (2017). Wild and cultivated plants from Transylvania based on Transsilvania Generalis by Joseph Benkő. *Acta Siculica*: 79–85.
- Watling, R., Gregory, N.M. & Orton, P.D. (1993). Cortinariaceae. *Edinburgh: Royal Botanic Garden*.

