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Volume 8 - 2021

CARNETS NATURES

Carnetsnatures.fr

Editeur : ASNAT, Muséum d'Histoire naturelle, 81600, Gaillac

ISSN 2427-6111

A First Contribution to the knowledge of Mycetozoa from Aveyron (France)

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Abstract

A first official taxonomic checklist of myxomycetes from the French department Aveyron is presented. As the result of data collected by the Mycological and Botanical Association of Aveyron (AMBA), literature and online research, a total of 21 species representing 14 genera, 7 families and 5 orders, were recorded. The following information for each taxon was reported: Latin name, author(s), Basionym, locality (if known) and record sources. Macrophotographs of some new records are also appended. This work is a contribution to the knowledge of myxomycetes of Aveyron, which will eventually be integrated into a national checklist project of French myxomycetes.

Key words: Biodiversity, inventory, taxonomy, Myxomycetes, Occitanie.

Résumé

Une première contribution à la connaissance des Mycetozoa de l'Aveyron (France)

Une première liste officielle sur les Myxomycètes du département français de l'Aveyron est présentée. Au total, 21 espèces représentant 14 genres, 7 familles et 5 ordres, ont été listées, grâce aux données collectées par l'Association Mycologique et Botanique de l'Aveyron (AMBA) et à un travail de recherche bibliographique. Les informations suivantes pour chaque taxon ont été indiquées : nom latin, auteur(s), basionyme, localité (si connue) et les références. Des macrophotographies de quelques nouveaux taxa aveyronnais sont aussi annexées. Ce travail est une contribution à la connaissance des myxomycètes d'Aveyron, qui sera éventuellement intégré à un projet de checklist nationale des Myxomycètes de France.

Mots clés : Biodiversité, inventaire, taxonomie, Myxomycètes, Occitanie.

Introduction

Myxogastria, also called myxomycetes, are single-celled eukaryotes that are characterized by the formation of a plasmode and usually associated with decaying plant material (Clavender 1995). They were initially included as fungi (lineage Myxomycota) mainly because of their phagotrophic nutrition mode and the production of fruiting bodies and dispersal by spores (Baba 2012; Sevindik & Akgul 2019). However, this grouping proved to be polyphyletic, including several independent protist lineages, none of them linked to the Fungi kingdom *sensu stricto*. The traditional classification of myxomycetes was based on a combination of morphological characters, including fructification, appearance of the plasmodium and finally the fruiting body development. This traditional classification has undergone many changes over the years. It was initially based on the colour of the spore mass, the Amaurosporeae (dark-spored) and Lamprosporeae (bright-spored) (Rostafiński 1875). After many changes and new classification proposals (Massee 1892; Lister 1894, 1911; Macbride 1922; Lister 1925; Jahn 1928; Hagelstein 1944; Martin 1960), the classification of myxomycetes presented by Martin and Alexopoulos (1969), separating

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myxomycetes into 5 major orders, has been accepted worldwide and used even in recent articles (Poulain *et al*., 2011a, 2011b).

With the arrival of new molecular phylogeny techniques, the group of myxomycetes was one of the last to be studied with the expertise of this technique (Leontyev *et al.*, 2019). The classification of myxomycetes is therefore changing, and requires further studies in the coming years (Stephenson 2011; Fiore-Donno *et al.*, 2012, 2013; Leontyev & Schnittler 2017; Leontvey *et al.,* 2019). The case of myxomycetes has therefore not attracted much interest from the non-specialist scientific community since the first descriptions and monographs on myxomycetes. A real need to study myxomycetes and revisit certain genera and families exists, not least as the need to know their biodiversity (Rollins & Stephenson 2011; Stephenson *et al.*, 2011; Novozhilov *et al.*, 2017).

In addition to molecular methods such as meta-barcoding (Feng & Schnittler 2016; Schnittler *et al*., 2017, Shchepin *et al*., 2019a, 2019b), knowing the diversity of myxomycetes notably involves carrying out species inventories, surveys and the definition of a checklist. Some countries, especially Turkey (Sesli *et al*., 2005, 2008, 2016), have started to publish lists of myxomycetes at a regional or national level (Ndiritu *et al.*, 2009; Chen *et al.*, 2010; Ranade *et al.*, 2012). It has been done in order to improve our knowledge in terms of specific diversity, but also in terms of distribution and ecological conditions related to those taxa. Regional or 'departmental' (county) inventories have already been carried out in some French 'departments', notably (amongst others) Rhône (Pouchet 1926, 1930; Martin & Martin, 2002), Vosges (Henry, 1924), Maine-et-Loire (Mornand, 1993), Loire-Atlantique (Chassain, 1972; Le Goff & Ribollet, 2018), and even in the French island territory of New Caledonia (Huguenin & Kohler 1969). Significant inventories and reviews have also been carried out at a national level (Cochet, 1977; Cochet & Bozonnet, 1980, 1984). However, many French departments do not have published data on myxomycetes, as is the case for Aveyron. A real need exists (i) to increase inventories at local and national level, (ii) to carry out a national checklist of French mycetozoa in addition to the monography published by Pouchet (1995) and the reference paper on myxomycetes from France (Poulain *et al*., 2011), and (iii) to publish data, unfortunately too often kept in-house, from local naturalist association or professional and amateur mycologists, often not consulted sufficiently. It is within this specific framework that the work proposed in this article is taking place. The French department of Aveyron is home to a high biodiversity, with numerous mycological and botanical stations. However, to the best of our knowledge, no official checklist on myxomycetes from Aveyron has yet been published. Only a few scattered data in the literature are available concerning macromycetes (e.g., Bourdot & Galzin 1927) and lichens (e.g., Sérusiaux 1982; Coste 2011). This article aims to contribute modestly to the knowledge of the myxomycetes of Aveyron, by presenting a first official preliminary list of the species of myxomycetes present in this understudied department.

Material & Methods

The department of Aveyron is located in the south of France, in the Occitanie region (**Fig. 1**). The climate associated is characterized and influenced by both the Massif Central and the Mediterranean. On a more local scale, this department can be subdivided in three different climate regions : the West, North and South of Aveyron, respectively having an oceanic, mountainous and submediterranean (or "perimediterranean") climate.

The search for verified and published data on myxomycetes from France, including Aveyron, was carried out via a first preliminary work of literature research. It was aided by technology allowing journal

Fig. 1 - Location of the French department of Aveyron, with the main towns indicated.

content searches, such as Google Scholar (http://scholar.google.com), JSTOR (http://www.jstor.org) and PubMed (https://pubmed.ncbi.nlm.nih.gov/). Research for myxomycetes records in Aveyron via online-databases, including INPN (https://inpn.mnhn.fr/collTerr/departement/choix/12), ADONIF (https://fongibase.adonif.fr/) and iNaturalist (https://www.inaturalist.org/) were also carried out. In addition to this first step, data on the species of Aveyron myxomycetes not published and collected by AMBA were added. The AMBA data come from numerous local mycological inventories throughout the Aveyron department, notably organized by its president, Jean-Louis Menos. During these inventories, by a simple method of prospecting and tracking, samples of fungi *sensu stricto* and myxomycetes were collected and identified *a posteriori* via macroscopic and microscopic criteria.

The data from these inventories were communicated internally via the edition of a booklet in 2011 (Menos & Ferrières, unpublished 2011) and updated in 2021 (Menos & Ferrières, unpublished 2021). The data from these inventories concerning Aveyron myxomycetes represent the main contribution of this article.

The taxonomic names used follow the nomenclature criteria proposed by Hernández-Crespo & Lado (2005) and only accepted taxonomic names are used. Due to the numerous changes made by molecular phylogeny in the classification of myxomycetes, and the recent redefinition of orders and families by Leontyev *et al.* (2019), the classification used in this list is that provided by MycoBank (Crous *et al.*, 2004; Robert *et al.,* 2005, 2013; consulted in July 2021), pending consensus in the phylogenetic classification of Mycetozoa. Only records identified at the species level were used for this first list. If identifications are questionable, doubtfull or merit further investigation, especially at the microscopic level, the latter are indicated with the mention To Be Confirmed (TBC) accompanied by an argument in the form of a note. TBC data was not included in the general list, but can be found in the section TBC data.

In the myxomycetes list, contributors of data apart from literature research are cited with the following abbreviation: "Liste des champignons d'Aveyron" by Jean-Louis Menos and Michel Ferrières, Mycological and Botanical Association of Aveyron, 2011: AMBA 2011 and the revised list in 2021: AMBA 2021; Jean-Louis Menos : JM; Michel Ferrières : MF; Jonathan Cazabonne : JC; Bernard Crozes : BC.
New records with the annotation 'AMBA 2011' mean the taxon concerned has been found in Aveyron over a time period of approximately 1991 up to 2011. The annotation AMBA 2021 means the taxon was found in Aveyron between 2011 and 2021.

Each species is enumerated, and its listing is given in order of classification according to Mycobank (2021), similar to the classification used by Mifsud (2020). For each species the following information is given: species name, author(s), basionym, record sources and locality with collecting date, when available. Collecting dates were not indicated in the dataset of the AMBA. The names of the geographical localities are voluntarily retained from the original French, to keep the true meaning and precision of the indications of the authors' mother tongue.

If no previous published data of the species' presence in Aveyron existed, then new records (NR) for the department are indicated with an asterisk (*) following species name. The system of the suprageneric taxa is in accordance with Kirk *et al.* (2001) and Kirk *et al.* (2004). The authors' names are abbreviated according to Kirk & Ansell (1992). Name of the author(s), Basionym and currently accepted names were verified with MycoBank (Crous *et al.*, 2004; Robert *et al.*, 2005, 2013; consulted in July 2021), Hernández-Crespo & Lado (2005; consulted in July 2021) and the CABI Index Fungorum (http://www.indexfungorum.org; consulted in July 2021).

Current accepted names are given in bold in the taxonomic and synonym list. Regarding the high number of nomenclature changes, especially in the taxonomy of myxomycetes, a list of all synonyms (**Appendix**) for each species is appended separately following Hernández-Crespo & Lado (2005). This system is in accordance with the recommendations of the ICN, International Code of Nomenclature for algae, fungi, and plants (Melbourne Code) (Barrie *et al.*, 2012). Each entry in the synonym list (Scientific name) is given in alphabetical order, and each of the synonyms is given following the order provided by Hernández-Crespo & Lado (2005). An exception is present for *Arcyria affinis* Rostaf., 1875 which has no currently-accepted synonyms.

Synonyms based on the same type specimen are given with the symbol ≡, synonym based on other type material are given with the symbol =. "?" accompanied by a synonym name means the synonymy is doubtful or needs to be verified.

Images of some new records are given and captioned accordingly. Photos credits are indicated in each caption.

Results

A total of 21 species, belonging to 14 genera, 7 families and 5 orders, have been listed to be present in the French department of Aveyron. Among this preliminary checklist, *Arcyria* and *Stemonitis* were the most frequent genera found (~0,14% each), followed by the genera *Lycogala, Physarum, Trichia* (~0,09% each) and *Ceratiomyxa, Comatricha, Didymium, Fuligo, Hemitrichia, Leocarpus, Mucilago, Reticularia* and *Tubifera* (~0,05% each).

The literature research revealed only two papers mentioning myxomycetes taxa in Aveyron (Eliasson & Lundqvist 1979; Mitchell *et al.,* 1984). Some data have been found on the ADONIF website (https://fongibase.adonif.fr/recherchecarto/), published by Jean-Claude Malaval. No records of myxomycetes from Aveyron have been noted in the INPN and iNaturalist online database. Fourteen species, *Arcyria affinis* Rostaf., *Arcyria obvelata* (Oeder.) Onsberg, *Ceratiomyxa fruticulosa* (O.F. Müll.) T. Macbr., *Fuligo septica* (L.) F.H. Wigg., *Hemitrichia clavata* (Pers.) Rostaf., *Leocarpus fragilis* (Dicks.) Rostaf., *Lycogala epidendrum* (J.C. Buxb. ex L.) Fr., *Lycogala flavofuscum* (Ehrenb.) Rostaf., *Mucilago crustacea* P. Micheli ex F.H. Wigg., *Reticularia lycoperdon* Bull., *Stemonitis axifera* (Bull.) T. Macbr., *Stemonitis splendens* Rostaf., *Trichia decipiens* (Pers.) T. Macbr., and *Tubifera ferruginosa* (Batsch) J.F. Gmel., are reported from the department for the first time. *Arcyria cinerea* (Bull.) Pers., *Comatricha laxa* Rostaf., *Didymium difforme* (Pers.) Gray, *Physarum album* (Bull.) Chevall., *Physarum decipiens* M.A. Curtis, *Stemonitis fusca* Roth and *Trichia varia* (Pers. ex J.F. Gmel.) Pers., have already been published in the literature or online databases. Of note, a specimen of *Fuligo candida* has been observed and identified by Michel Ferrières, based on macroscopic characteristics, in Aveyron. As no microscopic analysis was performed, the authors decided not to include this taxon in this present preliminary study, in order to avoid potential errors or doubtful data. In addition, two identifications were found to be questionable or would have required further microscopic studies, namely *Badhamia capsulifera* (Bull.) Berk. and *Arcyria ferruginea* Saut., respectively mentioned by MF and AMBA 2011. They have been included in the category "TBC data" and not included in the general list of Aveyron myxomycetes, in order to avoid integrating errors or invalidated data. The new data on Aveyron myxomycetes are those collected by AMBA (Jean-Louis Menos, Michel Ferrières, Bernard Crosses and Jonathan Cazabonne) and not published until now. These data are therefore considered as new records for the department.

Taxonomic list of myxomycetes

Protozoa
Amoebozoa
Mycetozoa

PROTOSTELIOMYCETES
Protosteliales
Ceratiomyxaceae

***Ceratiomyxa fruticulosa* ***
(O.F. Müll.) T. Macbr., 1899
Fig. 2

Basionym: *Byssus fruticulosa* Scop., 1772
Reference: AMBA 2011, locality unknown.

Fig. 2A-B - Macrophotographs of *Ceratiomyxa fruticulosa* collected in Aveyron, 10/08/2013 (Fig. A) and 12/06/2013 (Fig. B). Photographs ©Gérard Leduc. Scale: A, 15 mm; B, 5 mm.

MYXOMYCETES
Liceales
Reticulariaceae

***Lycogala epidendrum* * (L.) Fr., 1829**
Fig. 3

Basionym: *Lycoperdon epidendrum* L., 1753
Reference: AMBA 2011 and 2021, wood of Baraque des Pins - Commune of Saint-Beauzély, Brunes Forest - Commune of Trémouilles; JC, Roquefort-sur-Soulzon, Lauras and Millau; BC, Communes of Naucelle and Sauveterre.

Fig. 3A-B - Macrophotographs of *Lycogala epidendrum* at a young and mature stage of development, respectively, collected in Aveyron, 19/06/2013 (Fig. A) and 15/04/2013 (Fig. B). Photographs ©Gérard Leduc. Scale: A, 5 mm; B, 2,5 mm.

L. flavofuscum * (Ehrenb.) Rostaf., 1873
Fig. 4

Basionym: *Diphterium flavofuscum* Ehrenb., 1818
Reference: AMBA 2021, locality unknown.

Reticularia lycoperdon * Bull., 1790
Fig. 5

Basionym: *Reticularia lycoperdon* Bull., 1790
Reference: AMBA 2011, locality unknown.
Note: Was initially reported as *Enteridium lycoperdon* (Bull.) M.L. Farr., 1976 by the AMBA.

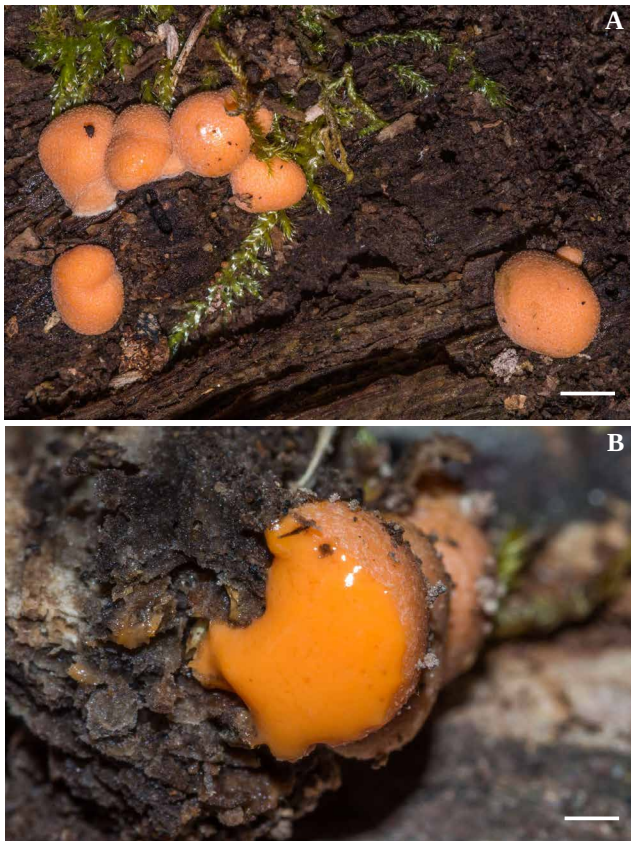

Fig. 4A-B - Macrophotographs of *Lycogala flavofuscum* collected in Aveyron, 01/05/2013 (Fig. A and B). It should be noted that the photographed specimen is of small size, compared to the morphotype of the species. Photographs ©Gérard Leduc. Scale: A, 15 mm; B, 5 mm.

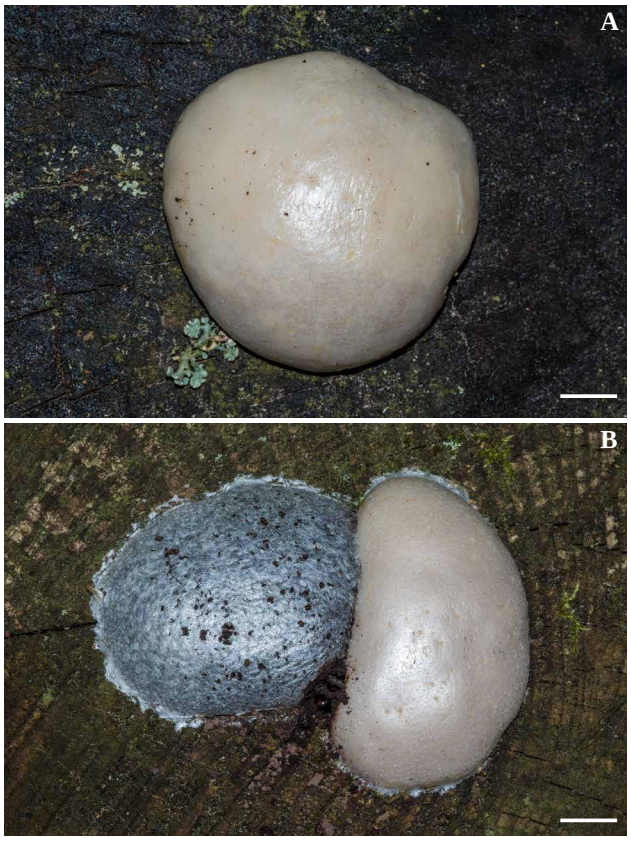

Fig. 5A-B - Macrophotographs of *Reticularia lycoperdon* collected in Aveyron, 20/07/2013 (Fig. A and B). Photographs ©Gérard Leduc. Scale: A, 10 mm; B, 12 mm.

***Tubifera ferruginosa* * (Batsch) J.F. Gmel., 1792**
Fig. 6

Basionym: *Stemonitis ferruginosa* Batsch., 1786
Reference: AMBA 2011, near Curan on the departmental road (RD) 911 - Commune of Curan.

Fig. 6A-B - Macrophotographs of *Tubifera ferruginosa* collected in Aveyron, 26/07/2013 (Fig. A) and 03/08/2011 (Fig. B). Photographs ©Gérard Leduc. Scale: A, 1 mm; B, 5 mm.

Physarales
Didymiaceae

***Mucilago crustacea* ***
P. Micheli ex F.H. Wigg., 1780
Fig. 7

Basionym: *Mucilago crustacea* P. Micheli ex F.H. Wigg., 1780
Reference: AMBA 2021, locality unknown; MF, Belcastel, on a chestnut branch.

Fig. 7 - Macrophotographs of *Mucilago crustacea* collected in Aveyron, 22/11/2011. Photographs ©Gérard Leduc. Scale: 2 cm.

***Didymium difforme* (Pers.) Gray, 1821**

Basionym: *Diderma difforme* Pers., 1797
Reference: Eliasson & Lundqvist, 1979. p. 564, Chaos of Montpellier-le-Vieux.

Physaraceae

***Fuligo septica* * (L.) F.H. Wigg., 1780**
Fig. 8

Basionym: *Mucor septicus* L., 1763
Reference: AMBA 2011, Wood of Baraque des Pins - Commune of Saint-Beauzély, Wood of Crémade - Commune of la Cavalerie; JC and JM, Castelnau-Pegayrols, deciduous forest; BC, Commune of Naucelle.
Note: *Fuligo septica* (L.) F.H. Wigg. and *Fuligo candida* Pers., 1796 were initially reported as two different species by the AMBA. However, these two names have now become synonymous.

Fig. 8 - Macrophotographs of *Fuligo septica* collected in Aveyron, 20/07/2013. Photographs ©Gérard Leduc. Scale: 3 cm.

***Leocarpus fragilis* * (Dicks.) Rostaf., 1874**

Basionym: *Lycoperdon fragile* Dicks., 1785
Reference: AMBA 2011, Peyre - Communes of Comprégnac and Millau, Brunes Forest - Commune of Trémouilles; MF, Peyrelade (near Rivière-sur-Tarn), in a wood dominated by *Quercus ilex* L., 1753. Another specimen of *Leocarpus fragilis* have been found in Aveyron by MF. However, the identification might be doubtful and would have deserved further microscopic study. These are either young subjects of *Leocarpus fragilis* which do not yet show the foot and the elongation/stretching characteristic of the mature fructification or a species of the genus *Trichia*, a hypothesis which is not excluded.

Physarum album (Bull.) Chevall., 1826

Basionym: *Sphaerocarpus albus* Bull., 1789
Reference: Jean-Claude Malaval, Mélagues, 19/11/2004.
Notes: Initially reported as *Physarum nutans* Pers., 1795 by Jean-Claude Malaval in the ADONIF Website.

Physarum decipiens M.A. Curtis, 1848

Basionym: *Physarum decipiens* M.A. Curtis, 1848
Reference: Mitchell *et al*., 1984 p. 58, Millau.

Stemonitales
Stemonitidaceae

Stemonitis axifera * (Bull.) T. Macbr., 1889
Fig. 9

Basionym: *Trichia axifera* Bull., 1791
Reference: AMBA 2021, locality unknown.
Notes: One specimen was initially reported as *Stemonitis ferruginea* Ehrenb., 1818 by the AMBA.

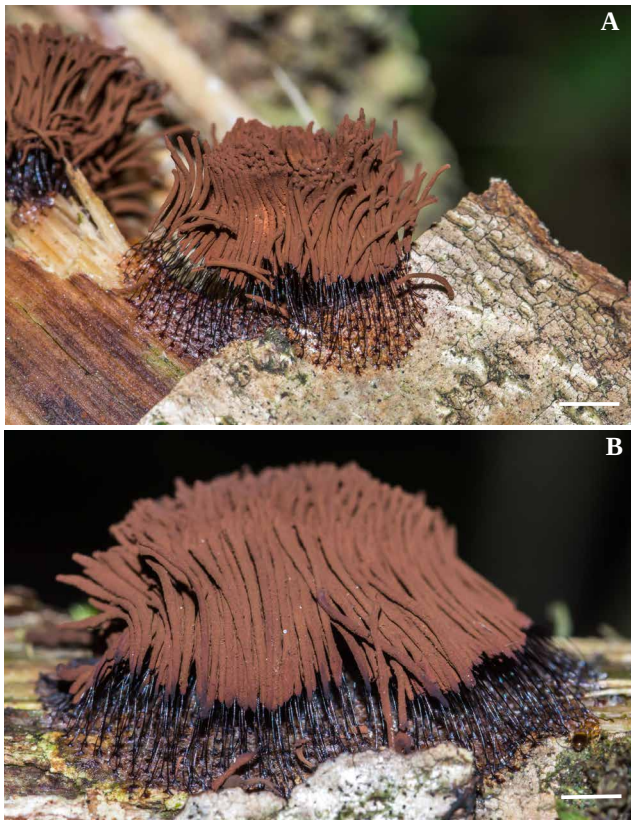

Fig. 9 A-B- Macrophotographs of *Stemonitis axifera* collected in Aveyron, 09/06/2016 (Fig. A and B). Photographs ©Gérard Leduc. Scale: A, 10 mm; B, 6 mm.

Stemonitis fusca Roth, 1787

Basionym: *Stemonitis fusca* Roth, 1787
Reference: Mitchell *et al.*, 1984.p. 57, Millau (12) as *Stemonitis nigrescens* Rex ; AMBA 2021, locality unknown.
Notes: The specimen mentioned by the AMBA was initially recorded as *Stemonitis nigrescens* Rex, 1891.

Stemonitis splendens * Rostaf., 1874

Basionym: *Stemonitis splendens* Rostaf., 1874
Reference: AMBA 2021, Locality unknown.
Notes: Initially reported as *Stemonitis lignicola* Nann.-Bremek., 1973 by the AMBA.

Comatricha laxa Rostaf., 1874

Basionym: *Comatricha laxa* Rostaf., 1874
Reference: Mitchell *et al.*, 1984 p 56 , Millau.

Trichiales
Arcyriaceae

Arcyria obvelata * (Oeder.) Onsberg, 1979
Fig. 10

Basionym: *Embolus obvelatus Oeder, 1770*
Reference: AMBA 2011 and 2021, locality unknown.

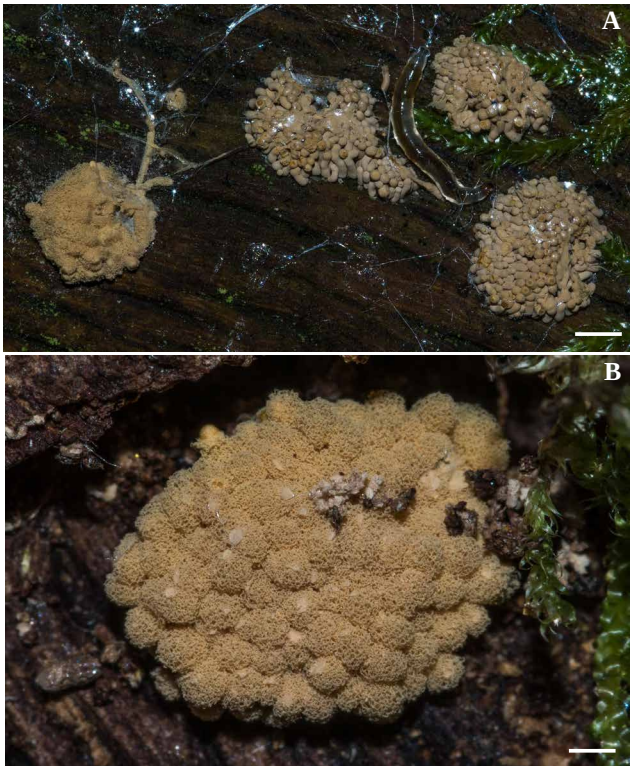

Fig. 10A-B - Macrophotographs of *Arcyria obvelata* collected in Aveyron, 16/06/2013 (Fig. A and B). Photographs ©Gérard Leduc. Scale: A, 3 mm; B, 0,5 mm.

Arcyria affinis * Rostaf., 1875

Basionym: *Arcyria affinis* Rostaf., 1875
Reference: AMBA 2021, locality unknown.

Arcyria cinerea (Bull.) Pers., 1801

Basionym: *Trichia cinerea* Bull., 1790
Reference: Mitchell *et al.*, 1984 p 55., Millau (12).

Trichiaceae

Hemitrichia clavata * (Pers.) Rostaf., 1873
Fig. 11

Basionym: *Trichia clavata* Pers., 1794
Reference: AMBA 2021, locality unknown; Jean-Claude Malaval, Mélagues, 09/11/2011.

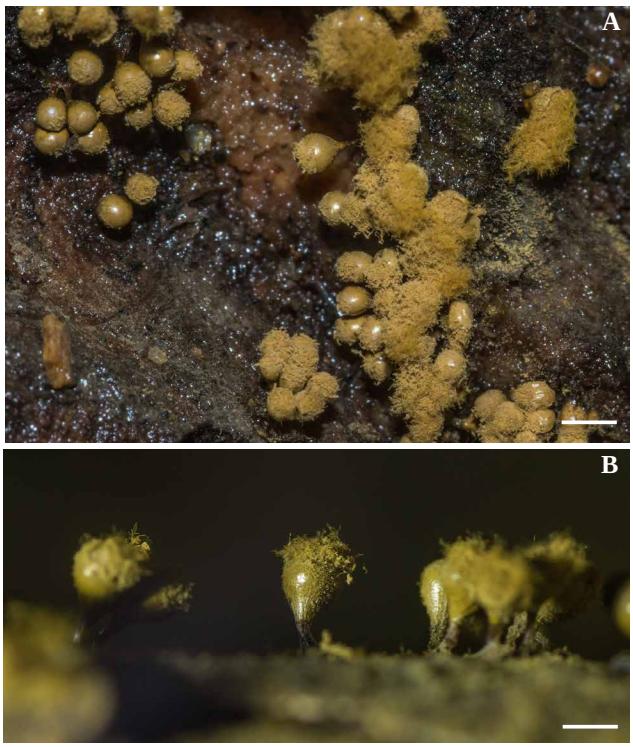

Fig. 11A-B - Macrophotographs of *Hemitrichia clavata* collected in Aveyron, 15/12/2016 (Fig. A) and 18/12/2016 (Fig. B). It should be noted that the photographed specimen is not representative of the "type" of the species. Photographs ©Gérard Leduc. Scale: A, 3,5 mm; B, 1,5 mm.

Trichia varia (Pers. ex J.F. Gmel.) Pers., 1794

Basionym: *Stemonitis varia* Pers. ex J.F. Gmel., 1792.
Reference: Jean-Claude Malaval, Mélagues, 07/12/2001.

Trichia decipiens * (Pers.) T. Macbr., 1889
Fig. 12

Basionym: *Arcyria decipiens* Pers., 1795
Reference: AMBA 2021, locality unknown; Jean-Claude Malaval, Mélagues, 19/11/2004.

Fig. 12A-B - Macrophotographs of *Trichia decipiens* immature collected in Aveyron, 06/10/2012 (Fig. A) and 29/12/2012 (Fig. B). Photographs ©Gérard Leduc. Scale: A, 3,5 mm; B, 2,5 mm.

TBC Data

Badhamia sp *
Fig. 13

Reference: MF, 09/03/2013
Note: The specimen collected by MF belongs to the genus *Badhamia*. However, without the material retained to carry out a microscopic study, identification stops at the level of the genus. However, several hypotheses can be made. A microscopic study could have confirmed that it was *Badhamia capsulifera* (Bull.) Berk., 1852. In addition, the little calcareous peridium evokes *B. foliicola* Lister, 1897, if the support was on the ground, or *B. utricularis* (Bull.) Berk., 1852 whose hypothallus is not developed. Consequently, this specimen is attributed a « To Be Confirmed » mention.

Fig. 13 - Macrophotographs of *Badhamia sp* collected in Aveyron, 09/03/2013. Photographs ©Gérard Leduc. Scale: 5 mm.

***Arcyria ferruginea* * Saut., 1841**
Fig. 14

Basionym: *Arcyria ferruginea* Saut., 1841
Reference: JM, locality unknown.
Note: It is very likely that the species harvested is *Arcyria ferruginea*, especially because of its capillitum weakly attached to the cup. However, since the specimen has not been conserved by the determiner, confirmation on microscopic characters cannot be conducted. As a result, this species was not included in the general List, and was given a "To Be Confirmed (TBC)" endorsement.

Fig. 14 - Macrophotographs of *Arcyria ferruginea* collected in Aveyron, 22/08/2017. TBC. Photographs ©Gérard Leduc. Scale: 1,5 mm.

Discussion and Conclusion

It should be noted that the material related to the specimens and records mentioned in the literature and by Jean-Claude Malaval were not examined by the authors. This research and data collection work on Aveyron myxomycetes is intended to be as exhaustive as possible. However, unpublished data in both the literature and online databases may exist and therefore not be mentioned in this preliminary list. This list is therefore destined to be completed in the coming years. If new data is accumulated in the future, additions to this first list will be made and published.

Most of the species recorded in this bibliographic and inventory work are common and present in other French departments. This relatively small number of species of myxomycetes in Aveyron reflects a significant bias, notably the lack of inventory and studies on myxomycetes. It can reasonably be assumed that this list represents only a very small subsection of the myxomycete diversity present in the department. This list is obviously destined to be completed and complemented by other data in the coming years.
This work was a way to value the contribution and investment of local mycological associations, data held by amateur mycologists and to encourage mycologists from Aveyron or more widely France to come and contribute to the knowledge of myxomycetes from Aveyron and other French departments.

Acknowledgments: The authors would like to thank all the members of the AMBA who have contributed over the decades to the collection of Myxomycetes and Fungi in general, and this for decades. Special thanks go to Michel Ferrières for having communicated some localities for *Leocarpus fragilis* and *Mucilago crustacea* in Aveyron. Thanks also to Gérard Leduc for the magnificent photos taken during the inventories carried out independently or with the AMBA. The authors also thank Bernard Crozes for providing his data on myxomycetes from Aveyron to the AMBA.
Our warm greetings go to Xavier Bossier for having read and commented on the earlier version of this manuscript, as well for the reviewer Marianne Meyer for her constructive suggestions.

Contributions: Jonathan Cazabonne initiated, conceptualized and wrote the manuscript. Jean-Louis Menos and Michel Ferrières provided most of the data on Aveyron's myxomycetes. JC, MF and JM all contributed to the bibliographic research. All three authors have read and accepted the final version of the published manuscript.

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Appendix. List of Synonyms

ARCYRIA affinis Rostaf.

ARCYRIA cinerea *(Bull.) Pers.* ≡ *Trichia cinerea* Bull. ≡ *Stemonitis cinerea* (Bull.) J.F. Gmel. = *Arcyria albida* Pers. = *Stemonitis glauca* Trentep. = *Stemonitis glauca* var. *subglobosa* Trentep. = *Stemonitis digitata* Schwein. = *Arcyria digitata* (Schwein.) Rostaf. = *Clathroides digitatum* (Schwein.) E. Sheld. = *Arcyria cinerea* var. *digitata* (Schwein.) G. Lister. = *Arcyria trichioides* Corda. = *Arcyria leprieurii* Mont. = *Stemonitis grisea* Opiz. = *Arcyria bicolor* Berk. & M.A. Curtis. = *Arcyria pallida* Berk. & M.A. Curtis. = *Arcyria cinerea* subsp. *subleionema* Rostaf. = *Arcyria friesii* Berk. & Broome. = *Arcyria stricta* Rostaf. = ? *Lachnobolus arcyrella* Rostaf. = *Comatricha alba* Schulzer. = *Arcyria cinerea* var. *cribroides* Raunk. = *Arcyria cookei* Massee. = *Clathroides cookei* (Massee) E. Sheld. = *Arcyria tenuis* J. Schröt. = *Arcyria digitata* f. *subglobosa* Meyl. = *Arcyria digitata* f. *globosa* Meyl. = *Arcyria cinerea* f. *subglobosa* Meyl. = *Arcyria cinerea* f. *rubella* Y. Yamam.

ARCYRIA ferruginea Saut. = *Clathroides ferrugineum* (Saut.) E. Sheld. = *Arcyria dictyonema* Rostaf. = *Clathroides dictyonema* (Rostaf.) E. Sheld. = *Arcyria intricata* Rostaf. = *Arcyria cinnamomea* Hazsl. = *Clathroides cinnamomea* (Hazsl.) E. Sheld. = *Arcyria bonariensis* Speg. = *Clathroides bonariense* (Speg.) E. Sheld. = *Arcyria macrospora* Peck = *Arcyrella inermis* Racib. = *Clathroides inerme* (Racib.) E. Sheld. = *Arcyrella decipiens* Racib. = *Arcyria raciborskii* Berl. = *Clathroides raciborskii* (Berl.) E. Sheld. = ? *Arcyrella cornuvioides* Racib. = *Arcyria ferruginea* f. *cornuvioides* (Racib.) Torrend = *Arcyria cornuvioides* (Racib.) Krzemien. = *Arcyria aurantiaca* Raunk. = *Clathroides aurantiacum* (Raunk.) E. Sheld. = *Heterotrichia gabriellae* Massee = *Arcyria ferruginea* var. *gabriellae* (Massee) Grove = *Arcyria ferruginea* f. *heterotrichia* Torrend = *Arcyria ferruginea* var. *heterotrichia* (Torrend) G. Lister = *Arcyria clavata* L.F. Celak. = *Arcyria incarnata* var. *nodulosa* T. Macbr. = *Arcyria adnata* var. *nodulosa* (T. Macbr.) Sacc. & Traverso = *Arcyria nodulosa* (T. Macbr.) T. Macbr. = *Arcyria ferruginea* f. *helvetica* Torrend = *Arcyria ornata* Widder = *Arcyria ferruginea* var. *antverpiensis* Robbr.

ARCYRIA obvelata (Oeder.) Onsberg. ≡ *Embolus obvelatus* Oeder. = *Trichia nutans* Bull. = *Stemonitis nutans* (Bull.) J.F. Gmel. = *Arcyria nutans* (Bull.) Grev. = *Arcyrella nutans* (Bull.) Racib. = *Clathroides nutans* (Bull.) E. Sheld. = *Arcyria flava* Pers. = *Stemonitis amoena* Trentep. = *Trichia elongata* Schumach. = *Arcyria alutacea* Schumach. = *Arcyrella nutans* var. *brevispina* Racib. = *Arcyrella nutans* var. *spinosissima* Racib.

BADHAMIA capsulifera *(Bull.) Berk.* ≡ *Sphaerocarpus capsulifera* Bull. ≡ *Trichia capsulifera* (Bull.) DC. ≡ *Physarum capsuliferum* (Bull.) Chevall. = *Physarum hyalinum* Pers. = *Badhamia hyalina* (Pers.) Berk. = *Physarum hyalinum* var. *albidum* Alb. & Schwein. = *Physarum botryoides* var. *hyalinum* Fr. = *Badhamia hyalina* var. *subsessilis* Rostaf. = *Badhamia hyalina* var. *gracilis* Rostaf. = *Badhamia varia* Massee = *Badhamia capsulifera* var. *libera* Torrend = *Badhamia capsulifera* var. *repens* G. Lister = *Badhamia capsulifera* var. *arborea* G. Lister = *Badhamia capsulifera* f. *monilifera* T. Macbr.

CERATIOMYXA fruticulosa *(O.F. Müll.) T. Macbr.* ≡ *Byssus fruticulosa* O.F. Müll. ≡ *Famintzinia fruticulosa* (O.F. Müll.) Lado = *Tremella hydnoidea* Jacq. = *Ceratium hydnoideum* (Jacq.) Alb. & Schwein. = *Ceratiomyxa hydnoidea* (Jacq.) Kuntze = *Ceratiomyxa mucida* var. *hydnoidea* (Jacq.) Torrend = C*eratium hydnoideum* var. *ramossisimum* (Jacq.) Peck = *Ceratium hydnoideum* var. *subreticulatum* (Jacq.) Peck = *Clavaria puccinia* Batsch = *Clavaria byssoides* Bull. = *Puccinia byssoides* (Bull.) J.F. Gmel. = *Corynoides byssoides* (Bull.) Gray = *Isaria mucida* Pers. = *Ceratium mucidum* (Pers.) J. Schröt. = *Ceratiomyxa mucida* (Pers.) J. Schröt. = *Isaria mucida* Schumach. = *Ceratium pyxidatum* Alb. & Schwein. = *Ceratium porioides* Alb. & Schwein. = *Famintzinia porioides* (Alb. & Schwein.) Hazsl. = *Ceratiomyxa porioides* (Alb. & Schwein.) J. Schröt. = *Ceratiomyxa mucida* var. *porioides* (Alb. & Schwein.) Lister = *Ceratiomyxa fruticulosa* var. *porioides* (Alb. & Schwein.) G. Lister = *Ceratium porioides* var. *flavum* Alb. & Schwein. = *Ceratiomyxa fruticulosa* var. *porioides* f. *flava* (Alb. & Schwein.) Y. Yamam. = *Ceratium porioides* var. *lacteum* Alb. & Schwein. = *Ceratium aureum* Link = *Ceratiomyxa fruticulosa* f. *aurea* (Link) Y. Yamam. = *Ceratium rubicundum* Link = *Ceratium pyxidatum* var. *cornutum* Wallr. = *Ceratium pyxidatum* var. *flabellatum* Wallr. = *Ceratium arbuscula* Berk. & Broome = *Ceratiomyxa arbuscula* (Berk. & Broome) Pat. = *Ceratiomyxa mucida* var. *arbuscula* (Berk. & Broome) Torrend = *Ceratiomyxa fruticulosa* var. *arbuscula* (Berk. & Broome) Minakata = *Ceratiomyxa fruticulosa* var. *arbuscula* (Berk. & Broome) Nann. -Bremek. = *Ceratium filiforme* Berk. & Broome = *Ceratium crustosum* Berk. & M.A. Curtis = *Ceratiomyxa fruticulosa* var. *crustosum* (Berk. & M.A. Curtis) Minakata = *Ceratium fuscum* Cooke = *Ceratium roseum* Cooke = *Ceratium sphaeroideum* Kalchbr.

& Cooke = *Ceratiomyxa plumosa* G.F. Atk. = *Ceratiomyxa mucida* var. *flexuosa* Lister = *Ceratiomyxa fruticulosa* var. *flexuosa* (Lister) G. Lister = *Ceratiomyxa porioides* f. *alba* Torrend = *Ceratiomyxa caesia* E. Jahn = *Ceratiomyxa fruticulosa* var. *caesia* (E. Jahn) G. Lister = *Ceratiomyxa fruticulosa* f. *aurantiaca* Jaap = *Ceratiomyxa freyana* Meyl. = *Ceratiomyxa fruticulosa* var. *comata* Lavrov = *Ceratiomyxa fruticulosa* var. *descendens* Emoto = *Ceratiomyxa descendens* (Emoto) Emoto = *Ceratiomyxa fruticulosa* var. *rosella* Cejp = *Ceratiomyxa fruticulosa* var. *porioides* f. *rosea* Y. Yamam.

COMATRICHA laxa *Rostaf.* ≡ *Stemonitis laxa* (Rostaf.) Massee = *Badhamia penetralis* Cooke & Ellis = *Lamproderma ellisianum* Cooke = *Comatricha ellisiana* (Cooke) Ellis & Everh. = *Stemonitis macrosperma* (Racib.) Massee = *Comatricha macrosperma* Racib. = *Comatricha macrosperma* var. *oblonga* Racib. = *Comatricha macrosperma* var. *obovata* Racib = *Comatricha sommerfeltii* A. Blytt = *Comatricha ellisii* Morgan

DIDYMIUM difforme *(Pers.) Gray* ≡ *Diderma difforme* Pers. ≡ *Physarum difforme* (Pers.) Link ≡ *Didymium difforme* (Pers.) Duby ≡ *Chondrioderma difforme* (Pers.) Rostaf. = *Licea caesia* Schumach. = *Physarum caesium* (Schumach.) Fr. = *Amphisporium versicolor* Link = *Didymium versicolor* (Link) Léman =? *Didymium cyanescens* Fr. & Palmquist = *Diderma cyanescens* (Fr. & Palmquist) Fr. = *Licea alba* Nees = *Lycogala minutum* Grev. = *Physarum album* (Nees) Fr. = *Reticularia pusilla* Fr. =? *Diderma liceoides* Fr. = *Licea macrospora* Schwein. = *Diderma macrosporum* (Schwein.) Kuntze =? *Diderma neesii* Corda = *Diderma libertianum* Fresen. = *Didymium libertianum* (Fresen.) de Bary = *Chondrioderma liceoides* Rostaf. = *Chondrioderma micraspis* Speg. = *Diderma persoonii* T. Macbr. = *Didymium tubulatum* E. Jahn = *Didymium difforme* var. *repandum* G. Lister = *Didymium difforme* var. *bendelii* Ejale

FULIGO septica (L.) F.H. Wigg. = *Fuligo candida* Pers. ≡ *Mucor septicus* L. ≡ *Reticularia septica* (L.) With. ≡ *Fuligo septica* (L.) J.F. Gmel. ≡ *Aethalium septicum* (L.) Fr. = *Mucor mucilago* Scop. = *Mucor ovatus* Schaeff. = *Reticularia ovata* (Schaeff.) With. = *Fuligo ovata* (Schaeff.) T. Macbr. = *Reticularia lutea* Bull. = *Reticularia hortensis* Bull. = *Fuligo hortensis* (Bull.) Duby = *Aethalium rufum* (Pers.) Wallr. = *Aethalium rufum* (Pers.) Alexandrovicz = *Fuligo flava* Pers. = *Aethalium flavum* (Pers.) Link = *Aethalium septicum* var. *flavum* (Pers.) Fr. = *Fuligo septica* var. *flava* (Pers.) Lázaro Ibiza = *Fuligo septica* f. *flava* (Pers.) Y. Yamam. = *Fuligo rufa* Pers. = *Reticularia rufa* (Pers.) Schwein. = *Aethalium septicum* var. *rufum* (Pers.) Fr. = *Fuligo septica* var. *rufa* (Pers.) Lázaro Ibiza = *Fuligo septica* f. *rufa* (Pers.) Y. Yamam. = F*uligo vaporaria* Pers. = *Reticularia vaporaria* (Pers.) Chevall. = *Aethalium vaporarium* (Pers.) Becker = *Aethalium septicum* var. *vaporarium* (Pers.) Rabenh. = *Fuligo septica* var. *vaporaria* (Pers.) Lázaro Ibiza. = *Aethalium candidum* (Pers.) Schltdl. = *Fuligo septica* var. *candida* (Pers.) R.E. Fr. = *Fuligo septica* f. *candida* (Pers.) Meyl. = *Fuligo pallida* Pers. = *Reticularia cerea* Sowerby = *Fuligo carnea* Schumach. = *Fuligo flavescens* Schumach. = *Reticularia carnea* (Schumach.) Fr. = *Fuligo cerebrina* Brond. = *Fuligo varians* Sommerf. = *Aethalium septicum* var. *cinnamomeum* Fr. = *Aethalium ferrincola* Schwein. = *Licea lindheimeri* Berk. = *Tubulina lindheimeri* (Berk.) Massee = *Tubifera lindheimeri* (Berk.) E. Sheld. = *Fuligo varians* f. *ecorticata* Rostaf. = *Fuligo varians* var. *ecorticata* (Rostaf.) Cooke = *Fuligo tatrica* Racib. = *Fuligo candida* Jahn = *Fuligo septica* var. *cinnamomea* R.E. Fr. = *Fuligo septica* f. *corticata* Meyl. = *Fuligo septica* var. *rosea* Nann.-Bremek. = *Fuligo candida* f. *persicina* Y. Yamam. = *Fuligo septica* var. *lapislazulicolor* H.Marx & Kuhnt

HEMITRICHIA clavata (Pers.) Rostaf. ≡ *Trichia clavata* Pers. ≡ *Hemiarcyria clavata* (Pers.) Rostaf. ≡ *Arcyria clavata* (Pers.) Massee ≡ *Hyporhamma clavatum* (Pers.) Lado = *Trichia erythropus* I.G. Borshch. = *Hemiarcyria ablata* Morgan = *Hemiarcyria funalis* Morgan = *Hemitrichia clavata* var. *altaica* Lavrov

LEOCARPUS fragilis (Dicks.) Rostaf. ≡ *Lycoperdon fragile* Dicks. ≡ *Reticularia fragilis* (Dicks.) Poir. = *Lycoperdon parasiticum* With. = *Lycogala parasiticum* (With.) With. ex G. Lister. = *Diderma vernicosum* var. *parasiticum* (With.) Pers. = *Leocarpus parasiticus* (With.) Gray. = *Diderma vernicosum* Pers. = *Physarum vernicosum* (Pers.) Schumach. = *Leocarpus vernicosus* (Pers.) Link ex Nees. = *Leangium vernicosum* (Pers.) Fr. = *Trichia lutea* Trentep. = *Spumaria ramosa* Schumach. = *Physarum nitidum* Schumach. = *Diderma ramosum* (Schumach.) Fr. = *Leocarpus ramosus* (Schumach.) Fr. = *Diderma vernicosum* var. *ovatum* Alb. & Schwein. = *Leocarpus spermoides* Link. = *Leocarpus atrovirens* Fr. & Lindgr. = *Leangium atrovirens* (Fr. & Lindgr.) Fr. = *Diderma atrovirens* (Fr. & Lindgr.) Fr. = *Tripotrichia elegans* Corda. = *Leocarpus vernicosus* f. *lignicola* Meyl. = *Liceopsis jurensis* Meyl. = *Leocarpus fragilis* f. *plasmodiocarpia* Meyl. = *Leocarpus bisporus* Nann.-Bremek. & D.W. Mitch. = *Leocarpus fragilis* var. *bisporus* (Nann.-Bremek. & D. W. Mitch.) D. W. Mitch.

LYCOGALA epidendron (J.C. Buxb. ex L.) Fr. ≡ *Lycoperdon epidendrum* L. = *Galeperdon epidendrum* (L.) F.H. Wigg. = *Lycoperdon variolosum* L. = *Mucor lycogala* Scop. = *Mucor fragiformis* Schaeff. = *Lycoperdon*

pisiforme Jacq. = *Lycoperdon chalybeum* Batsch. = *Lycogala miniatum* Pers. = *Reticularia miniata* (Pers.) Poir. = *Reticularia rosea* DC. = *Lycogala ferrugineum* Schumach. = *Reticularia punctata* Poir. = *Lycogala terrestre* Fr. & Lindgr. = *Lycogala epidendrum* var. *terrestre* (Fr. & Lindgr.) Y.Yamam. = *Lycogala miniatum* var. *marginatum* Gray. = *Lycogala affine* Berk. & Broome. = *Lycogala miniatum* var. *fuligineum* Gray. = *Lycogala nigricans* Lloyd.

LYCOGALA flavofuscum (Ehrenb.) Rostaf. ≡ *Diphtherium flavofuscum* Ehrenb. ≡ *Reticularia flavofusca* (Ehrenb.) Fr. = *Lycogala repletum* Morgan = *Lycogala flavofuscum* var. *argentea* = *Verrucosia corticola* Teng = *Lycogala corticola* (Teng) Teng = *Lycogala flavofuscum* var. *albidum* Wichansky = *Lycogala flavofuscum* var. *armeniacum* Wichansky

MUCILAGO crustacea P. Micheli ex F.H. Wigg. = *Mucor spongiosus* Leyss. = *Mucilago spongiosa* (Leyss.) Morgan = *Reticularia alba* Bull. = *Spumaria alba* (Bull.) DC. = *Spumaria mucilago* Pers. = *Spumaria alba* var. *mucilago* (Pers.) Morgan = *Spumaria cornuta* Schumach. = *Spumaria alba* var. *cornuta* (Schumach.) Fr. = *Didymium spumarioides* Fr. = *Spumaria alba* var. *laminosa* Fr. = *Diderma spumariiforme* Wallr. = *Spumaria alba* var. *dictyospora* R.E. Fr. = *Mucilago spongiosa* var. *dictyospora* (R.E. Fr.) G. Lister = *Mucilago dictyospora* (R.E. Fr.) Lizárraga = *Spumaria alba* var. *solida* Sturgis = *Mucilago spongiosa* var. *solida* (R.E. Fr.) G. Lister = *Mucilago solida* (Sturgis) E. Jahn = *Mucilago crustacea* var. *solida* (Sturgis) G. Lister ex Nann.-Bremek.

PHYSARUM album (Bull.) Chevall. ≡ *Sphaerocarpus albus* Bull. ≡ *Stemonitis alba* (Bull.) J.F. Gmel. ≡ *Trichia alba* (Bull.) Raeusch. ≡ *Mucor albus* (Bull.) Sobol. ≡ *Trichia alba* (Bull.) DC. ≡ *Tilmadoche alba* (Bull.) E. Sheld. ≡ *Tilmadoche alba* (Bull.) T. Macbr. ≡ *Physarum album* (Bull.) Moesz = *Physarum nutans* Pers. = *Tilmadoche nutans* (Pers.) Rostaf. = *Trichia nutans* Trentep. = *Physarum nutans* var. *subtile* Pers. = *Physarum album* var. *subtile* (Pers.) Chevall. = *Physarum bulbiforme* Schumach. = *Physarum albopunctatum* Schumach. = *Physarum didymium* Schumach. = *Physarum furfuraceum* Schumach. = *Didymium furfuraceum* (Schumach.) Fr. = *Physarum marginatum* Schumach. = *Didymium marginatum* (Schumach.) Fr. = *Physarum pini* Schumach. = *Tilmadoche pini* (Schumach.) Rostaf. = *Physarum subulatum* Schumach. = *Trichia cernua* Schumach. = *Physarum cernuum* (Schumach.) Fr. = *Tilmadoche cernua* (Schumach.) Fr. = *Craterium subulatum* (Schumach.) Mussat = *Physarum nutans* var. *vulgare* Alb. & Schwein. = *Physarum gracilentum* Fr. = *Tilmadoche gracilenta* (Fr.) Rostaf. = *Physarum nutans* f. *phycophilum* Rabenh. = *Physarum leucophaeum* f. *flexuosum* Rostaf. = *Physarum leucophaeum* var. *flexuosum* (Rostaf.) Cooke = *Physarum leucophaeum* f. *violascens* Rostaf. = *Physarum leucophaeum* var. *violascens* (Rostaf.) Cooke = *Physarum nutans* var. *violascens* (Rostaf.) Lister = *Tilmadoche nutans* var. *propria* Rostaf. = *Physarum leucophaeum* var. *stipitatum* Cooke = *Physarum leucophaeum* var. *stipitatum* f. *connexum* Cooke = *Physarum leucophaeum* var. *sessile* Cooke = *Physarum leucophaeum* var. *sessile* f. *conglobatum* Cooke = *Physarum leucophaeum* var. *violascens* f. *stipitatum* Cooke = *Physarum leucophaeum* var. *violascens* f. *sessile* Cooke = *Tilmadoche nutans* var. *rigida* Rostaf. = *Tilmadoche cernua* var. *rigida* (Rostaf.) L.F. Celak. = *Tilmadoche cernua* var. *deflexa* L.F. Celak. = *Physarum nutans* var. *iricolor* Brândza = *Physarum nutans* f. *rubrum* Nann.-Bremek. & Y. Yamam. = *Physarum nutans* var. *rubrum* (Nann.-Bremek. & Y. Yamam.) Chao H. Chung

PHYSARUM decipiens M.A. Curtis. ≡ *Badhamia decipiens* (M.A. Curtis) Berk. = *Physarum chrysotrichum* Berk. & M.A. Curtis. = *Badhamia chrysotricha* (Berk. & M.A. Curtis) Rostaf.

RETICULARIA lycoperdon Bull. ≡ *Fuligo lycoperdon* (Bull.) Schumach. ≡ *Enteridium lycoperdon* (Bull.) M.L. Farr. = *Mucor lycogala* Bolton. = *Lycogala punctatum* Pers. = *Lycogala turbinatum* Pers. = *Trichoderma fuliginoides* Pers. = *Strongylium fuliginoides* (Pers.) Ditmar. = *Reticularia umbrina* Fr. = *Reticularia lycoperdon* var. *americana* Nann.-Bremek. = *Enteridium lycoperdon* var. *americanum* (Nann.-Bremek.) Nann.-Bremek. ex Y. Yamam.

STEMONITIS axifera (Bull.) T. Macbr ≡ *Trichia axifera* Bull. = *Stemonitis fasciculata* Schumach. = *Stemonitis ferruginea* Ehrenb. = *Stemonitis smithii* T. Macbr. = *Stemonitis ferruginea* var. *smithii* (T. Macbr.) G. Lister = *Stemonitis axifera* var. *smithii* (T. Macbr.) Hagelst. = *Stemonitis microspora* Lister ex Morgan = *Stemonitis ferruginea* var. *violacea* Meyl. = *Stemonitis axifera* var. *smithii* f. *violacea* (Meyl.) Y. Yamam. = *Stemonitis ferruginea* f. *gibbosa* Meyl.

STEMONITIS fusca Roth = *Trichia nuda* With. = *Stemonitis fasciculata* Pers. ex J.F. Gmel. = *Trichia nuda* var. *minor* Purton = *Stemonitis maxima* Schwein. = *Stemonitis fusca* var. *maxima* (Schwein.) Torrend = *Stemonitis fusca* f. *major* Rostaf. = *Stemonitis fusca* f. *minor* Rostaf. = *Stemonitis dictyospora* Rostaf. =

Stemonitis nigrescens Rex = *Stemonitis fusca* var. *nigrescens* (Rex) Torrend = *Stemonitis castillensis* T. Macbr. = *Stemonitis fusca* var. *pinnata* L.F. Celak. = *Stemonitis fusca* var. *rufescens* Lister = *Stemonitis fusca* var. *papillosa* Meyl.

STEMONITIS splendens Rostaf. = *Stemonitis morganii* Peck, Bot. Gaz. = *Stemonitis splendens* var. *morganii* (Peck) Torrend = *Stemonitis baeuerlinii* f. *fenestrata* Rex = *Stemonitis fenestrata* (Rex) T. Macbr. = *Stemonitis splendens* var. *fenestrata* (Rex) Torrend = *Stemonitis webberi* Rex = *Stemonitis splendens* var. *webberi* (Rex) Lister = *Stemonitis baeuerlinii* Massee = *Stemonitis acuminata* Massee = *Stemonitis lignicola* Nann.-Bremek.

TRICHIA decipiens *(Pers.) T. Macbr.* ≡ *Arcyria decipiens* Pers. = *Lycoperdon pusillum* Hedw. = *Trichia pusilla* (Hedw.) G.W. Martin. = *Trichia fallax* Pers. = *Trichia virescens* Schumach. = *Trichia fallax* var. *dilutior* Alb. & Schwein. = *Trichia cerina* Ditmar. = *Trichia fallax* f. *cerina* (Ditmar) Rostaf. = *Trichia fallax* var. *cerina* (Ditmar) Berl. = *Trichia fulva* Purton. = *Trichia furcata* Wigand. = *Trichia fallax* f. *minor* Rostaf. = *Trichia fallax* var. *minor* (Rostaf.) Berl. = *Trichia nana* Zukal = *Trichia stuhlmannii* Eichelb. = *Trichia fallax* var. *gracilis* Meyl. = *Trichia decipiens* var. *gracilis* (Meyl.) Meyl. = *Trichia decipiens* f. *rubiformis* Meyl. = *Trichia decipiens* var. *hemitrichoides* Brândza = *Trichia fernbankensis* Frederick, R. Simons & I.L. Roth

TRICHIA varia (Pers. ex J.F. Gmel.) Pers. ≡ *Stemonitis varia* Pers. ex J.F. Gmel. = *Trichia olivacea* Pers. = *Trichia cordata* Pers. = *Trichia nigripes* var. *cordata* (Pers.) Pers. = *Trichia nigripes* var. *cordata* (Pers.) Alb. & Schwein. = *Trichia cylindrica* Pers. = *Trichia nigripes* var. *cylindrica* (Pers.) Pers. = *Trichia nigripes* Pers. = *Trichia varia* var. *diluta* Pers. = *Trichia varia* var. *subrufescens* Pers = *Trichia varia* var. *nigripes* (Pers.) Rostaf. = *Lycoperdon luridum* R.A. Hedw. = *Trichia varia* var. *sessilis* Rostaf. = *Trichia aculeata* L.F. Celak. = *Trichia varia* var. *aurata* Meyl. = *Trichia varia* var. *irregularis* Meyl. = *Trichia varia* var. *olivacea* Brândza = *Trichia synspora* Kowalski & McNichols

TUBIFERA ferruginosa (Batsch) J.F. Gmel. = *Tubulifera arachnoidea* Jacq. ≡ *Stemonitis ferruginosa* Batsch. ≡ *Lycoperdon ferruginosum* (Batsch) Timm. = *Lycoperdon favaceum* Schrank. = *Sphaerocarpus cylindricus* Bull. = *Tubifera cylindrica* (Bull.) J.F. Gmel. = *Tubulina cylindrica* (Bull.) DC. = *Licea cylindrica* (Bull.) Fr. = *Sphaerocarpus fragiformis* Bull. = *Tubifera fragiformis* (Bull.) J.F. Gmel. = *Tubulina fragiformis* (Bull.) Pers. = *Licea fragiformis* (Bull.) Nees. = *Licea tubulina* Schrad. = *Licea clavata* Schrad. = *Tubulina fragiformis* var. *clavata* (Schrad.) Pers. = *Tubulina coccinea* Trentep. = *Tubulina fragiformis* var. *coccinea* (Trentep.) Pers. = *Tubulina fallax* Pers. = *Tubulina fragiformis* var. *conica* Pers. = *Tubulina fragiformis* var. *papillata* Pers. = *Tubulina fragiformis* var. *operculata* Pers. = *Dermodium fallax* (Pers.) Nees. = *Licea fallax* (Pers.) Fr. & Lindgr. = *Tubulina fragifera* Poir. = *Licea effusa* Ehrenb. = *Licea iricolor* Zoll. = *Tubulina conglobata* Preuss. = *Licea rubiformis* Berk. & M.A. Curtis. = *Tubulina nitidissima* Berk. = *Tubulina speciosa* Speg. = *Tubifera speciosa* (Speg.) E. Sheld. = *Tubulifera umbrina* Zopf. = *Tubulina cylindrica* var. *acuta* Peck. = *Tubifera ferruginosa* var. *complanata* Meyl. = *Tubifera ferruginosa* var. *subungulata* Koaze. = *Tubifera ferruginosa* var. *albostipitata* Wichansky. = *Tubifera ferruginosa* subsp. *acutissima* Leontyev.

Soumis le 15 août 2021
Accepté le 24 août 2021
Publié en ligne (pdf) le 3 septembre 2021