

First supplement to the lichen checklist of South Africa



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Details are given of errors and additions to the recently published checklist of lichens reported from South Africa (Fryday 2015). The overall number of taxa reported from South Africa is increased by 1, to 1751.

Introduction

The compilation of the recent South African lichen checklist (Fryday 2015) was always considered a first step in producing an up-to-date, comprehensive checklist for the country. It was inevitable that some records and other taxonomic and nomenclatural changes would be overlooked and, through the Lichens-L listserve, lichenologists were encouraged to send any additions or corrections to the author that would be published as a first supplement to the list. This paper is the result of those contributions. These mostly refer to corrections to the text and nomenclatural updates but also included the records from a publication on *Usnea* (Motyka 1961) that was overlooked in the production of the original checklist, and the results of the revision in 2004 by the first author of a large number of Cladoniaceae from the Bolus Herbarium (BOL) of which very little has been published. Duplicates of many specimens were retained in the University of Helsinki Herbarium (H) whereas much of the lichen collection of the Bolus Herbarium has been transferred to the herbarium of the South African National Biodiversity Institute (SANBI), Pretoria (PRE). Another major South African *Cladonia* collection in Lund (LD) is still being studied by the first author in Helsinki.

In addition to the printed list (Fryday 2015), an online list, which will be regularly updated and includes the changes proposed here, is also now available (Fryday 2016). Future hard copy supplements will include only substantial changes (e.g. new addition to the lichen biota of South Africa and other changes that require explanation), and other changes (corrections to author citations, etc.) will be made to the online list only.

Corrections to the Checklist

General

Weber ex F. H. Wigg.: All author citations (in *Cladonia*, *Collema* and *Usnea*) should be corrected to F. H. Wigg. For example: *Cladonia rangiferina* (L.) Weber ex F.H. Wigg. should be *Cladonia rangiferina* (L.) F.H. Wigg.

Additions (43)

Cetraria muricata (Ach.) Eckfeldt: Reported by Kärnefelt (1986) as *Coelocaulon muricatum* (Ach.) J. R. Laundon.

Cladonia borbonica Nyl.: Abbayes (1964) described *C. poeciloclada* from South Africa but, although recognized by Swinscow & Krog (1988), this species was synonymized with *C. borbonica* by Ahti & Aptroot (1992).

Cladonia conista (Nyl.) Robbins: A widespread segregate of *C. humilis* that was reported from South Africa by Pino-Bodas *et al.* (2012). *Representative specimen*: Western Cape, Cape Peninsula, S end of Constantiaberg, 1945, F. M. Leighton 855 p.p. (PRE, H).

Cladonia corniculata Ahti & Kashiw.: A widespread species in the Southern Hemisphere. *Representative specimen*: KwaZulu-Natal, Bergville District, Drakenberg, Little Tugela Area, 5000 ft., 1943, E. Esterhuysen 8857 (PRE, H).

Cladonia crispata (Ach.) Flot.: A widespread species in the Northern Hemisphere. *Representative specimen*: KwaZulu-Natal, Bergville District, top of Mweni Pass, Drakensberg, 10 000 ft., 1958, E. Esterhuysen 27847 (PRE, H). The material seen contains squamatic acid (TLC) and represents var. *crispata*.

Cladonia cryptochlorophaea Asahina: A widespread, cosmopolitan segregate of *C. chlorophaea* (Flörke ex Sommerf.) Spreng. *Representative specimen*: Western Cape, Uniondale Division, Slypsteenbergh, Uniondale Hot Springs 1941, *E. Esterhuysen* 7129 (H, PRE); presence of cryptochlorophaeic acid confirmed with TLC (with some uncertainty).

Cladonia grayi G. Merr. ex Sandst.: A widespread, cosmopolitan segregate of *C. chlorophaea*. *Representative specimen*: Western Cape, Cape Peninsula, S end of Noordhoek Peak, 1900 ft., 1945, *F. M. Leighton* 927 (H, PRE). Presence of grayanic acid confirmed with TLC.

Cladonia humilis (With.) J. R. Laundon: A widespread species in temperate regions of the world that was reported from South Africa by Pino-Bodas *et al.* (2012). Here treated in the strict sense (i.e., excluding *C. conista*, which is cited above). In South Africa, more common than *C. conista*. *Representative specimen*: Western Cape, Stellenbosch Division, Stellenbosch Flats, top of first river terrace, 1944, *S. Garside* 6106 (PRE, H). Presence of atranorin confirmed with TLC.

Cladonia intermediella Vain.: Widespread in East Africa (Swinscow & Krog 1988). *Representative specimen*: Western Cape, Cape Peninsula, Table Mountain, summit, 1942, *S. Garside* s. n. (PRE, H). The South African specimens are not well-developed and therefore not fully certainly distinct from *C. pyxidata* (L.) Hoffm. s. lat.

Cladonia merochlorophaea Asahina: A widespread, cosmopolitan segregate of *C. chlorophaea*. *Representative specimen*: Western Cape, Clanwilliam Division, Cederberg, Kromme Rivier, 3500 ft., 1949, *T. P. Stokoe* 9444 (H, PRE). Presence of merochlorophaeic acid confirmed with TLC.

Cladonia peziziformis (With.) J. R. Laundon: *Representative specimen*: Western Cape, Cape Peninsula, Kirstenbosch, lower slopes north of Window Gorge; shaded soil surface. Alt. 500 ft., 1950 *E. Esterhuysen* 17333 (PRE, H).

Cladonia poeciloclada f. brachiata Abbayes: *Cladonia poeciloclada f. poeciloclada* Abbayes was synonymized with *C. borbonica* Nyl. (Ahti & Aptroot 1992), but the identity of the *f. brachiata*, which was also described from South Africa, is unresolved and so is included as a distinct taxon pending further study.

Cladonia subpungens Abbayes: This species was described from South Africa (Abbayes 1964; Ahti 1993).

Dimelaena tenuis (Müll. Arg.) H. Mayrhofer & Wippel: Overlooked by Fryday (2015). One record from KwaZulu-Natal (Mayrhofer *et al.* 1996).

Heppia guepinii var. nigrolimbata Nyl.: Of uncertain application but probably distinct from *H. guepinii* (Delise) Nyl. (= *Peltula euploca* (Ach.) Poelt; see below). It is provisionally included as a distinct taxon pending further study.

Lepraria sipmaniana (Kümmerl. & Leuckert) Kukwa: Overlooked by Fryday (2015). Described from KwaZulu-Natal (Leuckert & Kümmerling 1991).

Rinodina atroalbida (Nyl.) C.W.Dodge: Described from South Africa but the type could not be located (Mayrhofer 1984, Matzer & Mayrhofer 1996).

Rinodina australiensis Müll.Arg.: Reported by Mayrhofer *et al.* (2014).

Rinodina confragosa (Ach.) Körb.: Reported by Matzer & Mayrhofer (1996).

Rinodina geesterani H. Mayrhofer: Reported by Matzer & Mayrhofer (1996).

Rinodina oleae Bagl.: Reported by Matzer & Mayrhofer (1996; as *R. gennarii* Bagl.).

Rinodina huillensis Vain.: Reported by Matzer & Mayrhofer (1996).

Rinodina longisperma Matzer & H. Mayrhofer: Reported by Matzer & Mayrhofer (1996).

Rinodina microphthalma A. Massal.: Confirmed for South Africa by Matzer & Mayrhofer (1996) but excluded from *Rinodina*.

Rinodina oxydata s. lat. (A. Massal.) A. Massal.: Reported by Matzer & Mayrhofer (1996).

Rinodina scabridula Matzer & H. Mayrhofer: Reported by Matzer & Mayrhofer (1996).

Rinodina striatitunicata Matzer & H. Mayrhofer: Reported by Matzer & Mayrhofer (1996).

Rinodina substellulata Müll. Arg.: Reported by Matzer & Mayrhofer (1996).

Rinodina subtristis (Nyl.) H. Mayrhofer: Reported by Matzer & Mayrhofer (1996).

Siphula torulosa (Thunb. ex Ach.) Nyl.: Recognized as a good species by Mathey (1971) and Kantvilas (2002), not a synonym of *S. decumbens* Nyl. *Stereocaulon pulvinatum* Ach. should be included as a synonym.

The following *Usnea* species were all reported by Motyka (1961) from collections made by R. A. Mass Geesteranus in 1949 – a publication that was overlooked in the production of the original checklist (Fryday 2015). All collections are in the Nationaal Herbarium Nederland, Leiden (L). Full collection details can be found in Motyka (1961), which is available online.

Usnea chrysoleuca Motyka: *Cited Specimen*: Cape Province, Franschoekpas between Franschoek and Villiersdorp, *Mass Geesteranus* 6584, 11979.

Usnea dichroa var. spinulosa Motyka: *Cited Specimen*: Cape Province, Knysna District, Ruigtevlei between George and Knysna, *Mass Geesteranus* 12005.

Usnea eburnea Motyka: *Cited Specimens*: Cape Province, Knysna, Garden of Eden, *Mass Geesteranus* 12027a; Tzitzkama Mts., Plaat Forest near Storms River, *Mass Geesteranus* 12105.

Usnea implicita (Stirt.) Zahlbr.: *Cited Specimen*: Cape Province, Knysna, Garden of Eden, *Mass Geesteranus* 12028.

Usnea indigena Motyka: *Cited Specimens*: Cape Province, Knysna, Garden of Eden, *Mass Geesteranus* 12022, 12027b, 12026.

Usnea luteola Motyka: *Cited Specimens*: Cape Province, Knysna District, Deepwalls Forest Reserve, north of Knysna, *Mass Geesteranus* 694, 6696, 6697.

Usnea lyngei Motyka: *Cited Specimen*: Cape Province, Knysna District, Ruigtevlei between George and Knysna, *Mass Geesteranus* 12009.

Usnea myrioclada (Müll. Arg.) Zahlbr.: *Cited Specimens*: Cape Province, Knysna District, Deepwalls Forest Reserve, north of Knysna, *Mass Geesteranus* 6691, 6693.

Usnea os-elephantis Motyka **var. os-elephantis**: *Cited Specimen*: Cape Province, Knysna, Garden of Eden, *Mass Geesteranus* 12021.

Usnea pulvinata var. transvalensis (Vain.) Motyka: Reported by Motyka (1961) as 'transvaalensis'. *Cited Specimen*: Orange Free State, 5 miles west of Laybrand, *Mass Geesteranus* 6526.

Usnea rubescens Stirt.: *Cited Specimens*: Cape Province, Knysna District, Ruigtevlei between George and Knysna, *Mass Geesteranus* 12004, 12006; Knysna, Garden of Eden, *Mass Geesteranus* 12028; Knysna District, Deepwalls Forest Reserve, north of Knysna, *Mass Geesteranus* 6688, 6695.

Usnea torquescens Stirt.: *Cited Specimens*: Transvaal, between Sabie and Lijdenburg, Mt. Anderson, *Mass Geesteranus* 11939; Cape Province, Knysna District, Deepwalls Forest Reserve, north of Knysna, *Mass Geesteranus* 6695.

Xanthoparmelia mollis Hale: Inadvertently included with the previous entry, *X. minutella*, by Fryday (2015).

Deletions (42)

Buellia subtristis (Nyl.) Zahlbr.: = **Rinodina subtristis** (Nyl.) H. Mayrhofer (Mayrhofer 1984, Matzer & Mayrhofer 1996).

Cladonia bacillaris (Ach.) Genth: Usually recognised as a barbatic acid chemotype of **C. macilenta** Hoffm. The presence of both thamnolic and barbatic acid chemotypes in South Africa has been reported (Stenroos 1994).

Cladonia caespiticia (Pers.) Flörke: Not substantiated from South Africa.

Cladonia coniocraea (Flörke) Spreng.: All the Southern Hemisphere records of this species appear to belong to the closely related **C. ochrochlora** Flörke (cf. Ahti 2000), which has been substantiated from South Africa. However, the taxonomy of this complex is still incompletely understood.

Cladonia furcata (Huds.) Schrad.: Not substantiated for South Africa. It is expected that the records are referable to **C. subpungens** Abbayes.

Cladonia flabelliformis Vain.: nom. illeg. (not (Flörke) Vain.): A recognised synonym of *C. polydactyla* (Flörke) Spreng., but the name is misapplied and *C. polydactyla* does not occur in South Africa.

Cladonia multiformis G. Merr.: A misapplied name. *Cladonia multiformis* is known only from North America. Both African and more recent Asian reports have been found to be incorrect.

Cladonia pertriosa Kremp.: South African records are referable to **C. subpungens**. *Cladonia pertriosa* is an Australian endemic.

Cladonia polia R. Sant.: A synonym of **C. confusa** R. Sant. representing its usnic acid deficient strain (called *Cladina confusa* f. *bicolor* (Müll. Arg.) Ahti in Ahti 2000). This strain exists in South Africa, though it was not reported by Ahti (2000).

Cladonia portentosa (Dufour) Coëm.: First reported from South Africa by Abbayes (1939), as *C. impexa* Harm. South African records are referable to **C. confusa**.

Cladonia pycnoclada (Pers.) Nyl.: South African records are referable to **C. confusa**. The given synonym f. *exalbescens* Vain. is a synonym of **C. confusa**.

Cladonia rangiferina (L.) F.H. Wigg. (NOT Weber ex F.H. Wigg.): South African records are probably referable to **C. confusa**.

Cladonia rangiformis Hoffm.: South African records are referable to **C. subpungens**.

Cladonia rei Schaer.: Inadvertently included with *C. rangiformis* by Fryday (2015). *Cladonia fimbriata* var. *nemoxyna* (Ach.) Coem. and *C. fimbriata* var. *nemoxyna* f. *fibula* (Ach.) Vain. are synonyms of this species not *C. rangiformis*. However, *C. rei* has not been substantiated for South Africa.

Cladonia subradiata (Vain.) Sandst.: Not substantiated from South Africa. The given synonym *C. fimbriata* var. *balfourii* (Cromb.) Vain. belongs to *C. macilenta*, but the name has been used for *C. subradiata* in North America.

Cladonia subulata (L.) F. H. Wigg.: Not substantiated for South Africa. The records are probably referable to **C. corniculata** Ahti & Kashiw.

Heppia euploca Vain.: A synonym of **Peltula euploca** (Ach.) Poelt. Vainio (1921) under a note on *Lichen euplocus* Ach. gives a brief description comparing it to *Heppia guepinii* and then writes 'quae eam ob causam est *Heppia euploca* (Ach.)' [which is why it is *Heppia euploca* (Ach.)] so, clearly, he was making a new combination rather than describing a new species.

Heppia guepinii (Delise) Nyl.: A synonym of **Peltula euploca** (Ach.) Poelt.

Lithographa fumida Nyl.: Not validly published (nomen nudum). Stizenberger (1891) says, '1211. **L. fumida** Nyl. in Hb. Lojka — Saxicola socia *Siphulae tabularis* in Monte Tabulari ad Promontorium Bonae Spei, McOwen. – Endem', which does not constitute a valid description.

Pannaria capensis J. Steiner: This species, which was described from South Africa, is a synonym of **Pannaria lurida** (Mont.) Nyl. **subsp. lurida** (Jørgensen 2004)

Peccania arabica (Müll. Arg.) Henssen: The type collection is a poor mixture of at least two cyanolichens and Müller Argoviensis' diagnosis combines features from both; the small squamulose-lobate part is a *Collema* and the fertile, minutely squamulose part is a *Peccania*. Unfortunately, the *Peccania* is so meagre (there is only one small apothecia left) that it is not possible to confidently determine its identity, especially since there are several other small *Peccania* spp. from Arabia and northern Africa (e.g., '*Synalissa*' *arabica*, *Peccania sinaiensis*, *P. tiruncula*).

Peltigera leptoderma Nyl.: Listed as a synonym of *P. didactyla* (With.) J.R. Laundon but according to Vitikainen (1994) this is a misapplication, although the exact taxonomic status of the name is still uncertain.

Pyxine nubila Moberg: A synonym of **Culbersonia nubila** (Moberg) Essl., which was already included in Fryday (2015).

Rinodina detecta (Stizenb.) Zahlbr.: A synonym of **R. oxydata** (Matzer & Mayrhofer 1996).

Rinodina deminutula (Stizenb.) Zahlbr.: The scant type (from Western Cape) is in poor condition and a treatment of this species is not possible (Mayrhofer 1984).

Rinodina exigua (Ach.) S. F. Gray: The single South African collection was referred to **R. ficta** by Mayrhofer *et al.* (2014).

Rinodina exiguella (Vain.) H. Magn.: Not treated by Matzer & Mayrhofer (1996) or Mayrhofer *et al.* (2014). This species was described from the Arctic and its presence in South Africa is highly unlikely.

Rinodina huefferiana Müll. Arg.: The single South African collection was referred to **R. ficta** (Stizenb.) Zahlbr. by Mayrhofer *et al.* (2014).

Rinodina roboris Arnold: South African collections were referred to **R. australiensis** by Mayrhofer *et al.* (2014).

Rinodina sophodes (Ach.) A. Massal.: No South African collections of this northern hemisphere species could be traced by Mayrhofer *et al.* (2014) who rejected the species.

Rinodina sophodes var. *atroalbida* (Nyl.) Zahlbr.: type cannot be located (Mayrhofer 1984). Another South African collection was referred to **R. huillensis** by Mayrhofer *et al.* (2014).

Roccella arnoldii Vain.: A synonym of **Roccella tinctoria** DC. (Tehler *et al.* 2004), which does not occur in South Africa. All specimens seen are referable to **R. montagnei** Bél. (cortex C+ red; soralia C-).

Roccella capensis Follm.: A synonym of **Roccellina hypomecha** (Ach.) Bory (Tehler and Irestedt 2007).

Roccella fuciformis (L.) Lam. & DC.: Does not occur in South Africa (Tehler *et al.* 2004).

Roccella phycopsis Ach.: does not occur in South Africa (Tehler *et al.* 2004). All specimens seen are referable to **R. montagnei** (cortex C+ red; soralia C-).

Roccella fucoides (Dicks.) Vain.: A synonym of *Roccella phycopsis* Ach. (Tehler 2003), which does not occur in South Africa (Tehler *et al.* 2004). All specimens seen are referable to **R. montagnei** (cortex C+ red; soralia C-).

Roccella tinctoria DC.: Does not occur in South Africa (Tehler *et al.* 2004; Tehler *et al.* 2010). All specimens seen are referable to **R. montagnei** (cortex C+ red; soralia C-).

Siphula ceratites (Wahlenb.) Fr.: Misidentifications (Mathey 1971, Kantvilas 2002).

Siphula dregei Laur. (nomen nudum): Included in the synonymy of **S. verrucigera** by Mathey (1971) and Kantvilas (2002).

Siphula incrustans Vain.: Included in the synonymy of **S. verrucigera** by Kantvilas (2002).

Siphula minor Vain.: Included in the synonymy of **S. verrucigera** by Mathey (1971) and Kantvilas (2002).

Thyrea otaviana Brusse: Included in the synonymy of **Digitothyrea rotundata** (Büdel, Henssen & Wessels) P.P. Moreno & Egea by Moreno & Egea (1992).

Errata

Arthothelium fusco-nigrum (Nyl.) Müll. Arg.: Should be *Arthothelium fusconigrum*.

Bacidia luteola f. *chlorotica* Zahlbr.: A synonym of *B. rubella* (Hoffm.) A. Massal. NOT *Porina chlorotica* (Nyl.) Müll. Arg.

The basionym is *Lecidea luteola* var. *chlorotica* Ach. not *Verrucaria chlorotica* Ach.

Cetrelia cetrarioides (Delise) W.L. Culb. & C.F. Culb.: The correct author citation is (**Delise ex Duby**) W.L. Culb. & C.F. Culb., and that of the basionym is *Parmelia cetrarioides* **Delise ex Duby**.

Cetrelia olivetorum (Nyl.) W.L. Culb. & C.F. Culb.: the correct author citation for the synonym *Parmelia olivaria* is (**Ach.**) **Hue**.

Chiodecton natalense Nyl.: The correct spelling of the epithet of the synonym is *roseocinctum*. Vainio (1890) spelled the name 'roseo-cincta' but this is an orthographic error to be corrected.

Cladonia fimbriata var. *chlorophaeoides* Vain. and var. *chondroidea* Vain.: Listed as synonyms of *C. fimbriata* (L.) Fr. but, although still not typified, they cannot belong to *C. fimbriata*. They probably represent *C. subsquamosa* Kremp. (Ahti 2000) but that species is not known from South Africa. It is expected that the material belongs to *C. chlorophaea* (L.) Fr.

Cladonia leptoclada Abbayes: Not included by Fryday (2015) but the South African record reported by Ahti (1961) is referable to **C. confusa**.

Cladonia pocillum (Ach.) O.J. Rich.: The author citation should be (Ach.) **Grognot**, NOT (Ach.) O.J. Rich.

Cladonia rangiformis var. *pungens* (Ach.) Vain.: Listed as a synonym of *C. pertricensis*. This taxon is a synonym of *C. rangiformis* but the South African records probably do refer to **C. subpungens**.

Cladonia subulata (L.) Weber ex F.H. Wigg.: The author citation should be (L.) **F.H. Wigg.** NOT (L.) Weber ex F.H. Wigg.

Dimelaena oreina (Ach.) Norman: Additional reference **Mayrhofer et al. 1996** who included several records from South Africa, all referring to chemotype II.

Diploschistes diacapis (Ach.) Lumbsch: The correct spelling of the epithet is **diacapsis**.

Diploschistes muscorum subsp. *bartlettii* Lumbsch: The correct spelling of the subspecific epithet is **bartlettii**.

Fellhanera ubternella (Nyl.) Vězda: This should be **F. subternella** (Nyl.) Vězda.

Gonolecania umosonigricans (Müll. Arg.) Brusse: This should be **G. fumosonigricans** (Müll. Arg.) Brusse.

Granulopyrenis Aptroot: Incorrectly placed. It should be before **Graphina** Müll. Arg.

Heterodermia hypoleuca (Yasuda) D.D. Awasthi: Correct author citation of synonym is *Anaptychia hypoleuca* (**Muhl.**) **A. Massal.**

Heterodermia leucomea (L.) Poelt: The correct spelling of the epithets is **leucomelos**. The epithets *leucomela* and *leucomelaena* are incorrect variants.

Lecanora atraeformis Vain.: Should be corrected to *Lecanora atriformis* (ICN Rec. 60G).

Lecidea affine G. Merr.: Corrected spelling is *Lecidea affinis*, which would be a later homonym of *L. affinis* Schaer. (1850), if validated.

Lecidea fuscoatra Ach.: Correct spelling of the epithet of the synonym is **mosigii** Zahlbr.

Lecanora caesiorubella Ach.: Incorrectly placed. It should be before **L. campestris** (Schaer.) Hue.

Megalospora tuberculosa (Fée) Sipman: Included twice under *Megalospora*.

Melampyridium africana (Zahlbr.) Zahlbr.: Should be **M. africanum** (Zahlbr.) Zahlbr.

Pannaria globigera Hue: Should be **P. globuligera** Hue.

Pannaria leucosticta (Tuck.) Nyl. var. *isidiopsis* Nyl.: This taxon, which was described from South Africa, is a synonym of *P. globuligera* Hue NOT *Fuscopannaria leucosticta* (Tuck.) P.M. Jørg. (Jørgensen & Galloway 1992, Jørgensen 2004).

Pannaria rubiginosa (Thunb. ex Ach.) Delise: The correct author citation is *Pannaria rubiginosa* (**Ach.**) **Bory**. Add **Jørgensen 2004** to references (type specimen from South Africa cited).

Pannaria rubiginosa var. *phloeodes* (Stirt.) Stizenb.: This taxon, which was described from South Africa, is a synonym of **Pannaria lurida** (Mont.) Nyl. **subsp. lurida** NOT *P. rubiginosa* (Thunb. ex Ach.) Delise (Jørgensen 2004).

Pannaria pulvinula P.M. Jørg.: Add **Jørgensen 2004** to references (type specimen from South Africa (Prince Edward Islands) cited).

Parmeliella dactylifera P.M. Jørg.: Add **Jørgensen 2004** to references (type specimen from South Africa cited).

Parmotrema natalense J. Steiner & Zahlbr.: The correct epithet and author citation is **natalense** (**J. Steiner & Zahlbr.**) **Hale**.

Peltula euploca (Ach.) **Poelt ex Pišút**: Not *Peltula euploca* (Ach.) Poelt ex Ozenda & Clauzade. The invalid combination (no basionym) of Poelt (1963) was validated by Pišút (1967) who reported the species from Bulgaria as *Peltula euploca* (Ach.) Poelt, correctly cited the basionym, but did not mention the location of Poelt's invalid combination.

Phaeophyscia adiostola (Essl.) Essl.: The correct spelling is *Phaeophyscia adiaostola* (Essl.) Essl.

Physcia adscendens (Fr.) H. Olivier: The correct author citation is **H. Olivier** because Fries' name is illegitimate.

Physma allicarpum Hue: This should be **P. callicarpum** Hue.

Pilophorus aciculare (Ach.) Th. Fr.: The correct spelling of the epithet is **acicularis**. *Pilophoron* is an incorrect orthographic variant with no taxonomic status.

Porina euryspermum Zahlbr: The correct spelling of the epithet is **euryspema** and the author citation (**Stizenb.**) Zahlbr.

Porina mitatrix Müll. Arg.: This should be **P. imitatrix** Müll. Arg.

Psoroma asperellum Nyl.: Add **Jørgensen 2004** to references (type specimen from South Africa cited).

Ramalina complanata (Sw.) Ach.: Synonym should be *R. complanata* **var. paraguayensis** (not *v.*).

Ramalina gracilis (Pers.) Nyl.: Comment after synonym *R. exiguella* Stirt. should read (Australian records)

Ramalina roesleri (Hochst. ex Schaer.) Nyl.: Correct author citation is (**Schaer.**) Nyl.

Rinodina confragulosa Müll. Arg.: Should be *R. confragosula* (**Nyl.**) Müll. Arg.

Rinodina microlepida Müll. Arg.: Should be **R. microlepidea** Müll. Arg.

Solorina soreidiifera Nyl.: This should be removed from synonymy of *Peltigera didactyla* (With.) J.R. Laundon. It is already included as *P. soreidiifera* (Nyl.) Vitik.

Sticta hornemanni Fr.: The correct spelling of the epithet is **hornemannii**.

Tapellaria epiphlla (Müll. Arg.) R. Sant.: This should be **T. epiphylla** (Müll. Arg.) R. Sant.

Tuckermannopsis chlorophylla (Willd.) Hale: The correct author citation is (**Willd. ex Humb.**) Hale. Also the synonym should be *Cetraria chlorophylla* (**Willd. ex Humb.**) Poetsch.

Usnea barbata (L.) F.H. Wigg.: *Usnea plicata* F.H. Wigg., which was included as a synonym of this species, has been typified to *U. ceratina* Ach., but is *nom. utique rej.*

Usnea dasopoga (Ach.) Röhl.: the correct author citation for this and the orthographic variant *U. daypoga* is (**Ach.**) Nyl.

Usnea florida (L.) F.H. Wigg.: the correct author citation for *U. florida* var. *scabrosa* which was included as a synonym of this species is (**Ach.**) Vain., but this is a *nom. inval.*

Usnea subfloridana Stirt: Add period after author i.e., **Stirt.** The correct author citation for the synonym *Usnea comosa* is (**Ach.**) Vain.

Usnea trichodeoides Vain. ex Motyka: The correct author citation is **Vain.** and that of the synonym, *Dolichousnea trichodeoides* (**Vain.**) Articus.

The following *Usnea* species were all reported by **Motyka 1961**, and so this publication should be added to the references for these species:

Usnea delicata Vain.: (localities cited).

Usnea distensa Stirt.: (localities cited).

Usnea horridula (Müll. Arg.) Motyka: (localities cited).

Usnea maculata Stirt.: (localities cited).

Usnea molliuscula Stirt.: (localities cited).

Usnea moniliformis Motyka: (localities cited).

Usnea praelonga Stirt.: (localities cited).

Usnea promontorii Motyka: (localities cited).

Usnea rubicunda Stirt.: (localities for the synonym *U. spilota* Stirt. cited).

Usnea strigosella J. Steiner: (localities cited).

Usnea subleprosa Motyka: (localities cited).

Usnea trichodeoides Vain.: (localities cited).

Usnea desaea Stirt.: (localities for the synonym *U. undulata* Stirt. cited).

The second section of Motyka's *Usnea* monograph was published in two parts; the first in 1937 and the second in 1938. Most of the South African species were included in the first part and so all references to Motyka 1938 should be changed to Motyka 1937 except for *U. bornmuelleri*, J. Steiner, *U. cornea* Motyka, *U. filamentosa* Motyka, *U. primitiva* Motyka and *U. subleprosa* Motyka, which were included in the second part.

Verrucaria compacta aggr. (A. Massal.) Jatta: This should be (A. Massal.) Jatta, **aggr.**

Verrucaria viridula Ach.: The author citation should be (**Schrad.**) Ach.

Xanthoparmelia (Vain.) Hale: All author citations with 'G. Amo, et al.' should be corrected to **G. Amo et al.** (no comma). For example, *X. adligans* (Brusse) G. Amo et al. NOTE: G. Amo is sometimes cited as Amo de Paz, but G. Amo is used here throughout.

Xanthoparmelia cedri-montana Brusse: remove hyphen, **X. cedrimontana**. This is a *nomen novum* for *Parmelia stenophyllo* f. *hypomelaena* Vain. ex Lynge, which should be added to the synonyms.

Xanthoparmelia ceresina (Lynge) Hale: The correct author citation is (Vain. ex Lynge) Hale and that of *Parmelia ceresina* Vain. ex Lynge.

Xanthoparmelia conspersa (Ach.) Hale: Correct author citation for *Parmelia conspersa* is (Ach.) Ach.

Xanthoparmelia lichinoidea (Nyl.) O. Blanco *et al.*: The correct author citation is (Nyl. ex Cromb.) O. Blanco *et al.*

Xanthoparmelia plittii (Gyeln.) Hale: Delete *Parmelia subconspersa* var. *africana* Gyeln. From the synonyms because this is known only from Angola.

Xanthoparmelia schenkiana (Müll. Arg.) Hale: The correct spelling of the epithet is **schenkiana**.

Xanthoparmelia squamariata (Nyl.) O. Blanco *et al.*: The correct author citation is (Nyl. ex Cromb.) O. Blanco *et al.*

Xanthoparmelia waboombergensis (Essl.) O. Blanco *et al.*: In spite of the slight spelling difference, this is considered a later homonym of *X. waboomsbergensis* Elix and so is illegitimate and a new name is required for this taxon.

Xanthoria doidgea Eichenb., Aptroot & Honegger: Correct spelling of the epithet of new name is **doidgeae**.

Xanthoria elegans (Link) Th. Fr.: The correct author citation of *Rusavskia elegans* is (Link) S. Y. Kondr. & Kärnefelt.

Crombie J.M.1877: This was actually published in 1876, so should be Crombie J.M.1876b, with the previous reference becoming Crombie 1876a. This means the following references should also be changed: *Xanthoparmelia lichinoidea* & *X. squamariata* Crombie 1876a; *X. constrictans* Crombie 1876b.

Frey 1949: the correct title is 'Neue Beiträge zu einer Monographie des Genus *Umbilicaria* Hoffm., Nyl'.

Kondratyuk *et al.* 2008: the second *Xanthodactylon* should be in italics.

Name changes

Cladonia cervicornis subsp. *verticillata* (Hoffm.) Ahti: The current name is **Cladonia verticillata** (Hoffm.) Schaer.

Degelia plumbea (Lightf.) P.M. Jørg. & P. James: The current name is **Pectenium plumbeum** (Lightf.) P. M. Jørg., L. Lindblom, Wedin & S. Ekman (Ekman *et al.* 2014).

Lobaria quercizans Michx.: The current name is **Ricasolia quercizans** (Michx.) Stizenb. (Moncada *et al.* 2013).

Lobaria scrobiculata (Scop.) P. Gaertn.: The current name is **Lobarina scrobiculata** (Scop.) Nyl. (Moncada *et al.* 2013).

Lopezaria versicolor Kalb & Hafellner: The current name is **Megalaria versicolor** (Flot.) Fryday & Lendemer (Fryday & Lendemer 2010).

Melanelia panniformis (Nyl.) Essl.: The current name is **Montanelia panniformis** (Nyl.) Divakar, A. Crespo, Wedin & Essl. (Divakar *et al.* 2012).

Parmeliella brisbanensis (C. Knight) P.M. Jørg. & D.J. Galloway: The current name is **Lepidocollema brisbanense** (C. Knight) P. M. Jørg. (Ekman *et al.* 2014).

Parmeliella imbricatula (Müll. Arg.) P. M. Jørg.: The current name is **Lepidocollema imbricatum** (Müll. Arg.) P. M. Jørg. (Ekman *et al.* 2014).

Parmeliella lacerata P. M. Jørg.: The current name is **Austroparmeliella lacerata** (P. M. Jørg.) P. M. Jørg. (Ekman *et al.* 2014).

Parmeliella mariana (Fr.) P.M. Jørg. & D.J. Galloway: The current name is **Lepidocollema marianum** (Fr.) P. M. Jørg. (Ekman *et al.* 2014).

Pseudocyphellaria aurata (Ach.) Vain.: The current name is **Crocodia aurata** (Ach.) Link (Moncada *et al.* 2013).

Other comments

Lichen monocarpus Ach. *nom. utique rej.*: This taxon was described from South Africa and is an earlier name for *Cladonia didyma* (Fée) Vain. (Stenroos 1994). A proposal by Ahti & DePriest (2005) to reject the name has been accepted.

Results

The current paper includes 43 additions to and 42 deletions from the published list (Fryday 2015), with the result that the overall number of taxa reported from South Africa is increased by 1, to 1751.

Conclusion

In spite of the corrections listed here, the main deficiency of the list remains: because it was a literature-based compilation of taxa reported from the country, and many records date from the 19th (or even 18th) century, there is little doubt that many of the species on the list do not occur in South Africa. This is a problem that can only be addressed by a programme of lichen research, both in the field and the laboratory. In particular, the type of specimens of the numerous species described from South African collections by Stizenberger, Zahlbruckner and other workers, which are mostly in European herbaria, should be examined and their identity ascertained, along with a comprehensive programme of field work that should focus on crustose groups because these are by far the most under-collected and -recorded.

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Competing interests

The authors declare that they have no financial or personal relationships which may have inappropriately influenced them in writing this article.

Authors' contributions

T.A. provided data on the genera *Cladonia* and *Usnea* and made numerous other suggestions. H.M. provided data on the genus *Rinodina*. M.S. provided data on the family Lichinaceae. A.T. provided data on the family Roccellaceae. A.M.F. identified many other errors or omissions, compiled the data and was the project leader.

References

- Abbayes, H. des, 1939, 'Revision monographique des Cladonia du sous-genre Cladina (Lichens)', *Bulletin de la Société Scientifique de Bretagne* 16 (fasc. hors sér. 2), 1–156.
- Abbayes, H. des, 1964, 'Deux *Cladonia* (Lichens) nouveaux d'Afrique Australe', *Revue Bryologique et Lichénologique* 33, 235–239.
- Ahti, T., 1961, 'Taxonomic studies on reindeer lichens (*Cladonia*, subgenus *Cladina*)', *Annales Botanici Societatis Zoologicae Botanicae Fennicae 'Vanamo'* 32(1), i–iv + 1–160.
- Ahti, T., 1993, 'Names in current use in the Cladoniaceae (lichen-forming ascomycetes) in the ranks of genus to variety', *Regnum Vegetabile* 128, 58–106.
- Ahti, T., 2000, 'Cladoniaceae', *Flora Neotropica* 78, 1–362.
- Ahti, T. & Aptroot, A., 1992, 'Lichens of Madagascar: Cladoniaceae', *Cryptogamie, Bryologie-Lichénologie* 13(2), 117–124.
- Ahti, T. & DePriest, P., 2005, 'Proposals to conserve eight names and reject one species name in Cladoniaceae (Fungi)', *Taxon* 54, 183–188. <http://dx.doi.org/10.2307/25065321>
- Crombie, J.M., 1876a, 'New Lichens from the Cape of Good Hope', *The Journal of Botany* 14, 18–21.
- Crombie, J.M., 1876b, 'Lichenes Capenses, an enumeration of the lichens collected at the Cape of Good Hope by A.E. Eaton during the Venus-Transit Expedition in 1874', *Journal of the Linnean Society Botany* 15, 165–180. <http://dx.doi.org/10.1111/j.1095-8339.1876.tb00236.x>
- Divakar, P.K., Del-Prado, R., Lumbsch, R., Wedin, H.T., Esslinger, M., Leavitt, T.L., et al., 2012, 'Diversification of the newly recognized lichen-forming fungal lineage *Montanelia* (Parmeliaceae, Ascomycota) and its relation to key geological and climatic events', *American Journal of Botany* 99(12), 2014–2026. <http://dx.doi.org/10.3732/ajb.1200258>
- Ekman, S., Wedin, M., Lindblom, L. & Jørgensen, P.M., 2014, 'Extended phylogeny and a revised generic classification of the Pannariaceae (Peltigerales, Ascomycota)', *Lichenologist* 46(5), 627–656. <http://dx.doi.org/10.1017/S002428291400019X>
- Fryday, A.M., 2015, 'A new checklist of lichenised, lichenicolous and allied fungi reported from South Africa', *Bothalia; African Biodiversity and Conservation* 45(1), Art. #148, 4 pages. <http://dx.doi.org/10.4102/abc.v45i1.148>
- Fryday, A.M., 2016, 'A new checklist of lichenised, lichenicolous and allied fungi reported from South Africa', viewed 9 June 2016, http://herbarium.msu.edu/lichen/South_Africa/SA_List-latest.html
- Fryday, A.M. & Lendemer, J.C., 2010, 'Reassessment of the genus *Catillochroma* (lichenized Ascomycota, Ramalinaceae)', *Lichenologist* 42(5), 587–600. <http://dx.doi.org/10.1017/S0024282910000320>
- Jørgensen, P.M., 2004, 'Conspectus familiae Pannariaceae (Ascomycetes lichenosae)', *Illicifolia* 4, 1–78 (revised version).
- Jørgensen, P.M. & Galloway, D.J., 1992, 'Pannariaceae', *Flora of Australia* 54, 246–293.
- Kantvilas, G., 2002, 'Studies on the lichen genus *Siphula* Fr.', *Bibliotheca Lichenologica* 82, 37–53.
- Kärnefelt, I., 1986, 'The genera *Bryocaulon*, *Coelocaulon* and *Cornicularia* and formerly associated taxa', *Opera Botanica* 86, 1–90.
- Leuckert, C. & Kümmerling, H., 1991, 'Chemotaxonomische Studien in der Gattung *Leproloma* Nyl. ex Crombie (Lichenes)', *Nova Hedwigia* 52(1–2), 17–32.
- Mathey, A., 1971, 'Contribution a l'etude du genre *Siphula* (lichens) en Afrique', *Nova Hedwigia* 22, 795–878.
- Matzer, M. & Mayrhofer, H., 1996, 'Saxicolous species of the genus *Rinodina* (lichenized Ascomycetes, Physciaceae) in southern Africa', *Bothalia* 26, 11–30. <http://dx.doi.org/10.4102/abc.v26i1.683>
- Mayrhofer, H., 1984, 'Die saxicolen Arten der Flechtengattungen *Rinodina* und *Rinodinella* in der Alten Welt', *Journal of the Hattori Botanical Laboratory* 55, 327–493.
- Mayrhofer, H., Matzer, M., Wipfel, A. & Elix, J.A., 1996, 'The genus *Dimelaena* (lichenized Ascomycetes, Physciaceae) in the southern hemisphere', *Mycotaxon* 58, 293–311.
- Mayrhofer, H., Obermayer, W. & Wetschnig, W., 2014, 'Corticolous species of the genus *Rinodina* (lichenized Ascomycetes, Physciaceae) in southern Africa', *Herzogia* 27(1), 1–12. <http://dx.doi.org/10.13158/hea.27.1.2014.1>
- Moncada, B., Lücking, R. & Betancourt-Macuase, L., 2013, 'Phylogeny of the Lobariaceae (lichenized Ascomycota: Peltigerales), with a reappraisal of the genus *Lobariella*', *Lichenologist* 45(2), 203–263. <http://dx.doi.org/10.1017/S0024282912000825>
- Moreno, P.P. & Egea, J.M., 1992, '*Digitothyrea*, a new genus in the family Lichinaceae', *Lichenologist* 24(3), 215–228.
- Motyka, J., 1937, *Lichenum generis Usnea studium monographicum. Pars systematica, volumen secundum (pt 1)*, J. Motyka, Leopoli.
- Motyka, J., 1938, *Lichenum generis Usnea studium monographicum. Pars systematica, volumen secundum (pt 2)*, J. Motyka, Leopoli.
- Motyka, J., 1961, 'Usneae a R. A. Maas Geesteranus in Africa orientali et australi anno 1949 collectae', *Persoonia* 1(4), 415–431.
- Pino-Bodas, R., Ahti, T., Stenroos, S., Martín, M.P. & Burgaz, A.R., 2012, '*Cladonia conista* and *C. humilis* (Cladoniaceae) are different species', *Bibliotheca Lichenologica* 108, 161–176.
- Pišút, I., 1967, 'Prispevek k poznaniu lisajnikov Bulharska I (Beitrage zur Kenntnis der Flechten-Bulgariens I)', *Acta rerum naturalium Musei Nationalis Slovaci Bratislava* 13(2), 3–10.
- Poelt, J., 1963, 'Bestimmungsschuessel der hoeheren Flechten von Europa', *Mitteilungen der Botanischen Staatssammlung München* 4, 301–571.
- Stenroos, S., 1994, 'Revision of the South African *Cladonia* section *Cocciferae*', *Acta Botanica Fennica* 150, 179–183.
- Stizenberger, E., 1891, 'Lichenea Africana', *Bericht über die Thätigkeit der St. Gallischen naturwissenschaftlichen Gesellschaft* 1889–90, 133–268.
- Swinscow, T.D.V. & Krog, H., 1988, '*Macrolichens of East Africa*', British Museum (Natural History), London.
- Tehler, A., 2003, '*Roccella phycopsis* the correct name for *R. fucoides* (lichenized fungi)', *Taxon* 52, 621. <http://dx.doi.org/10.2307/3647467>
- Tehler, A., Dahlkild, Å., Eldenäs, P. & Feige, G.B., 2004, 'The phylogeny and taxonomy of Macaronesian, European and Mediterranean *Roccella* (Roccellaceae, Arthoniales)', *Symbolae Botanicae Upsalienses* 34, 405–428.
- Tehler, A. & Irestedt, M., 2007, 'Parallel evolution of lichen growth forms in the family Roccellaceae (Arthoniales, Euascomycetes)', *Cladistics* 23, 432–454. <http://dx.doi.org/10.1111/j.1096-0031.2007.00156.x>
- Tehler, A., Irestedt, M., Wedin, M. & Ertz, D., 2010, 'The Old World *Roccella* species outside Europe and Macaronesia, taxonomy, evolution and phylogeny', *Systematics and Biodiversity* 8, 223–246. <http://dx.doi.org/10.1080/14772001003789554>
- Vainio [Wainio], E.A., 1890, 'Etude sur la classification et la morphologie des lichens du Brésil', *Acta Societatis pro Fauna et Flora Fennica* 7(2), 1–247.
- Vainio, E.A., 1921, 'Lichenographia fennica I. Pyrenolichenes iisque proximi Pyrenomycetes et Lichenes imperfecti', *Acta Societatis pro Fauna et Flora Fennica* 49(2), 1–274.
- Vitikainen, O., 1994, 'Taxonomic revision of Peltigera (lichenized Ascomycotina) in Europe', *Acta Botanica Fennica* 152, 1–96.