An updated checklist of lichenized and lichenicolous fungi for Egypt

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Abstract


A revised lichen checklist for Egypt, the first to be published since 1901, is presented. It is based on a detailed literature survey supported by a limited study of herbarium material. The list includes 163 taxa of lichenized and lichenicolous fungi, six of which are newly recorded for the country. Synonymic interpretation, a short historical background and a comprehensive bibliography are also provided. The total lichen flora of Egypt is estimated to comprise no more than 250 species with a remarkably poor representation of many common groups, such as Parmeliaceae.

Key words: lichen biodiversity, archaeology, ethnobotany, Mediterranean flora.

Introduction

Egypt has the distinction of providing the world’s oldest lichen records, since they were used in mumification more than three millennia ago. However, the species used, Pseudevernia furfuracea, may well have been imported, probably from Greece. In the Mediterranean region its optimal habitat would be mountain forest, and it is doubtful if it would be found locally, certainly in sufficient quantities; however, it must be acknowledged that there have been dramatic changes in the N African environment over the past three millennia and there are recent reports of P. furfuracea from the Middle East (John & al. 2004). The function of lichens in mumification is often given as ‘aromatic’; although lichens are indeed used as a fixative in order to enhance aromas from other plants, which may have been one of its purposes in such cases, they are also noted for their antibiotic properties (Richardson 1988). Samples of P. furfuracea taken from mummies are to be found in collections throughout the world. Material extracted from a XXI dynasty tomb (see Germer 1988), housed in the Botanical Museum Berlin-Dahlem (B), is illustrated in Figs. 1 and 2.

For centuries lichens have been used not only for pharmaceutical purposes but have also provided food for humans (e.g. Schweinfurth 1918), used not for their culinary value but rather as a bulking ingredient; this can still be seen in Middle Eastern markets, where sacks of imported material, usually Parmotrema spp., are often for sale. The Biblical reference to manna is often inter-
Fig. 1. *Pseudevernia furfuracea* fragments: offering from an ancient Egyptian grave, in decorative early 20th century box. – Collection of Georg Schweinfurth at the Botanical Museum Berlin-Dahlem.
interpreted as referring to the lichen *Aspicilia esculenta* (Pall.) Flagey, whose thick wrinkled crusts when detached from rocks in significant quantities can be exploited as food or as fodder for the livestock (Richardson 1988). However, although this lichen is widespread in the Middle East, we have not found any published record from Egypt. It should be noted that there are several other interpretations of “manna from heaven”.

The earliest known herbarium specimen of a lichen from Egypt, namely *Cladonia convoluta*, was collected in about 1750 by Fredric Hasselquist (1722-52) and is currently housed in the Uppsala Herbarium (UPS) – see database http://www-hotel.uu.se/evolmuseum/ftytotek/. The first published records appear in two major works by Alire Raffeneau Delile (1778-1850): Flore d’Egypte and Florae Aegyptiacae Illustratio. Both were published in 1813, and contain references, the former with descriptions and figures of 11 species, to lichens seen by Delile during his investigations on behalf of Napoleon in 1798-1801. The second work lists 12 species from Egypt, some from the summit of the second Gizeh pyramid, together with 4 species on sale by Egyptian pharmacists, but imported from Greece. The Delile herbarium in Montpellier (MPU) requires a detailed examination as it may include type material for possibly nine species.

An historical resumé by Müller (1880a) provides details of the collections made by numerous botanists over the next three-quarters of a century, including Guiseppe Raddi (1770-1829), Christian Gottfried Ehrenberg (1795-1876), Charles du Bois Larbalastier (1838-1911), Paul Friedrich August Ascherson (1834-1913) and George August Schweinfurth (1836-1925). Other 19th and early 20th century botanists known to have collected lichens from Egypt include Karl Georg Theodor Kotschy (1813-66), Ernst Sickenberger (1831-95), Fritz Kern von Marilauen (1866-1944), William Barbey (1842-1914), Ludwig Rüttimeyer (1825-95, see Müller 1891), Johann Andreas Kneucker (1862-1946) and Joseph Friedrich Nicolaus Bornmüller (1862-1948). The major published works itemising many of these collections are provided by Nylander (1864, 1876), Müller (1880a-c, 1884), Stizenberger (1890, 1891), Sickenberger (1901) and Steiner (1893, 1916), but it should be noted that some of these works repeat earlier records, with some ambiguity resulting from synonymic interpretation (and erratic use of forma and variety), and, in the case of Sickenberger, considerable misspelling of Latin nomenclature.


The purpose of this study is to present an up-to-date survey of all published information, which is now scattered over the literature, and thus to facilitate further study of the Egyptian lichen flora. Consequently the checklist, which follows, is by no means exhaustive, since only lim-
ited material from the herbaria of Berlin (B), Farlow (FH), Uppsala (UPS) and M. R. D. Seaward has been examined as yet. A more precise evaluation can be made, particularly in respect of synonymic revision, once a more detailed examination of Egyptian material known, or thought, to be in the herbaria of BM, BRSL, C, COLO, FH, G, H, K, L, LE, LZ, M, MPU, P, S and UPS (abbreviations according to Holmgren & Holmgren 1998-ongoing) has been undertaken. In the meantime it is hoped that our listing will contribute to the objectives of OPTIMA in seeking a better understanding of the biodiversity and biogeographical status of the Mediterranean flora (Nimis 1996).

Results

Altogether 157 lichenized fungi (149 species and 8 infraspecific taxa) and 6 lichenicolous fungi are now reported for Egypt. Since only a few new collections were available for study, it is not surprising that few additional species were found, namely *Caloplaca flavescens*, *Fulgensia subbracteata*, *Lecania spadicea*, *Lecanora agardhiana*, *L. dispersa* and *Opegrapha celtidicola*.

As expected for a country largely consisting of desert, in which at least five millennia of human settlement have probably had a devastating influence on natural habitats, the number of reported species is modest. In comparison, for Syria, with a similar desert-like environment but with some high mountain ranges, 399 taxa were reported recently (John & al. 2004) and for the nearby Santorin archipelago, measuring only 76 km², almost treeless and completely destroyed in a volcanic explosion some 3500 years ago, 170 species are known (Sipman & Raus 1999).

It is tempting to estimate the total number of lichen species that occur in Egypt. There has been no recent intensive fieldwork by any trained lichenologist, which normally means that many additional species can be expected. However, many common and conspicuous lichen groups likely to be found by unexperienced observers are absent from the checklist below, such as species of *Pertusaria*, the *Lecanora subfusca* group and foliose *Parmeliaceae* and *Physciaceae*. This suggests that the lichen flora is really very limited and probably does not exceed 250 species.

In spite of its small size, the lichen flora is of considerable interest because it shows some remarkable features. Significantly, foliose lichens are very scarce, only being represented by the genera *Xanthoria* (7 species reported) and *Physcia* (1 species), while foliose *Parmeliaceae*, which are among the first lichens to be collected in any part of the world, are apparently absent. Remarkably the fruticose growth form is better represented, with members of the genera *Ramalina*, *Roccella*, *Seirophora* and *Tornabea*. At taxonomic level, the dominance of *Teloschistaceae* is conspicuous (39 taxa), which cannot only be explained by their conspicuous colours, since black-fruit ed species are also involved. The next largest families represented are *Roccellaceae* (16 taxa) and *Physciaceae* (12 taxa).

Annotated checklist

For each accepted species the pertinent literature references are presented. Occasional notes are provided on selected specimens, when seen by the authors, and on the interpretation of the references. The synonyms used in published Egyptian records are also listed. Lichenicolous fungi are indicated by “LF”; names preceded by an asterisk (*) are newly reported for Egypt, and names followed by an asterisk (*) have their nomenclatural types from Egypt.

Nomenclature, including synonymic interpretation, is based on a wide variety of sources, more particularly Nimis & Martellos (2003). Infraspecific taxa without modern taxonomic treatment have been included in the main species. Misspellings of Sickenberger are listed as separate entries when particularly confusing. No references are presented to evidently mere literature citations as in, e.g., Zahlbruckner’s Catalogus and Stizenberger’s Lichenaea Africana.

A. atrata Hue – Nylander 1864: 67 as Lecanora fuscata, reidentification according to Galun & Garty 1972: 243.
A. cervina A. Massal. – Müller 1880b: 43 as Placodium cervinum; Sickenberger 1901: 327 as Lecanora cervina.
A. interrupta Vain. = A. strigata
A. placenta (Ehrenb.) Hue* – Nylander 1864: 68 as Lecanora placenta; Magnusson 1929: 359. A. reagens f. radicans (Nyl.) H. Magn. = A. nodulosa var. reagens
A. rufescens Bausch – Nylander 1876: 284 as Lecanora rufescens; Müller 1880b: 43 as Placodium rufescens; Sickenberger 1901: 327 as Lecanora rufescens.
A. schleicheri f. radicans = A. nodulosa var. reagens
A. strigata (Nyl.) Jatta – Nylander 1864: 67 as Lecanora interrupta; Müller 1880b: 43 as Placodium interruptum; Sickenberger 1901: 327 as Lecanora interrupta; Magnusson 1929: 208; Galun & Garty 1972: 243 as Acaropora interrupta.
Amphiloma callopisma Müll. Arg. = Caloplaca aurantia
A. callopisma var. centroleucum (A. Massal.) Müll. Arg. = Caloplaca aurantia
A. callopisma var. exalbatum Müll. Arg.* = Caloplaca aurantia
A. ehrenbergii Müll. Arg.* = Caloplaca ehrenbergii
A. erythrinum Müll. Arg.* = Caloplaca erythrina
A. erythrinum var. cryptocarpum Müll. Arg.* = Caloplaca erythrina
A. erythrinum var. pulvinatum Müll. Arg.* = Caloplaca erythrina var. pulvinatum
A. murorum (Hoffm.) Körb. = Caloplaca saxicola
A. albopulverea Nyl. – Müller 1884: 18 as Arthothelium xylographoides; Sickenberger 1901: 330 as Arthonia xylographoidis [= xylographoides]; Galun & Garty 1972: 243 as Arthothelium xylographoides.
A. palmicola Ach.* – Acharius 1814: 5; Nylander 1876: 284; Müller 1880c: 80, 1884: 18; Sickenberger 1901: 329.
A. punctiformis var. subeminula Nyl.* – Nylander 1876: 284; Müller 1880c: 80; Sickenberger 1901: 330.
A. varians (Davies) Nyl. – Müller 1880c: 81 as Celidium varium; LF. A. xylographoides (Müll. Arg.) Willey = A. albopulverea
Aspicilia calcarea (L.) Körb. – Steiner 1916: 32 as Lecanora calcarea.
A. cheresina (Müll. Arg.) Hue* – Müller 1880c: 75, 1884: 16 as Lecanora cheresina; Sickenberger 1901: 326 as L. cheresina.
A. contorta subsp. hoffmanniana Ekman & Froberg – Müller 1880c: 76 as Lecanora calcarea var. hoffmanni [sic]; Sickenberger 1901: 326 as L. calcarea var. hoffmanni [sic].
A. farinosa (Flörke) Arnold – Nylander 1864: 67 as Lecanora calcarea f. farinosa; Müller 1880c: 76 as L. calcarea f. farinosa; Sickenberger 1901: 326 as L. farinosa; Galun & Garty 1972 as L. farinosa.
A. muelleri (J. Steiner) Hue – Steiner 1893: 170 as Lecanora mülleri.
A. rhizophora (Delile) Hue* – Delile 1813a: 155, 1813b: 33 as Urceolaria rhizophora; Müller 1880c: 76 as Lecanora rhizophora; Sickenberger 1901: 326 as L. rhizophora.
A. subcoerulea (Delile) Hue* – Delile 1813a: 154, 1813b: 33 as Urceolaria subcoerulea; Müller 1880c: 75 as Lecanora subcoerulea; Sickenberger 1901: 327 as L. subcoerulea.
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Müll. Arg.* =

C. interveniens

A. subcoerulea

(Ach.) Hue* – Delile 1813a: 154, 1813b: 33 as Caloplaca gilvella var. Müll. Arg.* = Caloplaca minuscula

C. pyraceum var. albopruinosa J. Steiner = C. agardhiana

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A. rhizophora

C. agardhiana

C. agardhiana f. albopruinoso J. Steiner = C. agardhiana
C. alociza (A. Massal.) Mig. – Wunder 1974: 50; Temina & al. 2005b: 87.
C. arnoldii (Wedd.) Ginzb. – Delile 1813a: 154, 1813b: 33 as Parmelia miniata Ach. – This is an unlikely record for Egypt and the material may concern another reddish coloured Caloplaca species with radial lobes, perhaps C. biatorina (A. Massal.) J. Steiner.
C. aurantia (Pers.) Hellb. Nylander 1864: 65 as Placodium callopismum, 1876: 284 as Lecanora callopisma; Müller 1880b: 42 as Ampilhoma callopisma incl. var. centroleucum and exalbatum, 1884: 15 as A. callopisma var. centroleucum; Steiner 1893: 169 as Caloplaca callopisma and var. exalbata; Sickenberger 1901: 322 as Lecanora callopisma [= callopisma], Lecanora sympagea var. exalbata and L. sympagea var. exalbata [centroleucum]; Steiner 1916: 37 as C. callopisma f. orientalis; Galun & Garty 1972: 249 as var. aurantia. – Alexandria, 1988, Seaward (herb. Seaward 105793). – This species has been confused with C. flavescens (Huds.) J. R. Laundon, and some of the records may belong to this species.
C. callopisma (Ach.) Th. Fr. = C. aurantia
C. callopisma var. exalbata Müll. Arg. = C. aurantia
C. callopisma f. orientalis J. Steiner = C. aurantia
C. circumalbata (Delile) Wunder* – Delile 1813a: 157, 1813b: 33 as Leceidea circumalbata; Müller 1880c: 73 as Calloppisma aegytiacum, 74 as var. depauperatum, 78 as Blastenia circumalbata and B. melanocarpa incl. var. versicolor, 79 as var. leucoloma, 1884: 17 as Calloppisma aegytiacum and C. interveniens; Steiner 1893: 169 as Caloplaca aegytiaca; Sickenberger 1901: 323 as Lecanora circumalbata, 324 as L. aegytiaca incl. var. depauperata, L. interveniens and L. melanocarpa incl. var. leucoloma and versicolour; Galun 1970: 87 as Caloplaca interveniens; Galun & Garty 1972: 249 as Caloplaca aegytiaca var. cinans J. Steiner; Wunder 1974: 53, 54, 61 as Caloplaca circumalbata var. circumalbata. – Heluan near Cairo, 800 ft, 1890, Schweinfurth (B 600069025); Temina & al. 2005b: 80 as Caloplaca circumalbata var. circumalbata.
C. circumalbata var. bicolor (Müll. Arg.) Wunder* – Müller 1880c: 78 as Blastenia melanocarpa var. bicolor; Sickenberger 1901: 324 as Lecanora melanocarpa var. bicolor; Galun & Garty 1972: 250 as Caloplaca rejecta var. bicolor; Wunder 1974: 70; Temina & al. 2005b: 92.
C. cirrochroa (Ach.) Th. Fr. – Sickenberger 1901: 323 as Lecanora cirrochroa [= cirrochroa].
C. citrina (Hoffm.) Th. Fr. – Nylander 1864: 65 as Placodium citrinum; Müller 1880b: 43 as Calloppisma citrinum, 1884: 17 as C. citrinum incl. var. microcarpum; Sickenberger 1901: 322 as Lecanora citrina incl. var. microcarpa; Galun & Garty 1972: 250. – Giza, 1988, Seaward (herb. Seaward 105651); Alexandria, 1988, Seaward (herb. Seaward 105792).
C. delilei J. Steiner = Caloplaca minima
C. erythrina (Müll. Arg.) Zahlbr.* – Müller 1880b: 42 as Ampilhoma erythrinum, 1880b: 43 as Ampilhoma erythrinum var. cryptocarpum; Sickenberger 1901: 322 as Lecanora erythrina, var. cryptocarpum.
C. flavovirescens (Wulfen) Dalla Torre & Sarnth. – Nylander 1864: 66 as Lecanora aurantiaca var. erythrella; Müller 1880b: 44 as Calloppisma aurantiaca var. erythrellum; Sickenberger 1901: 322 as Lecanora erythrella.
C. gilvella (Nyl.) Zahlbr.* – Nylander 1876: 282 as Lecanora gilvella; Müller 1880b: 44 as Calloppisma gilvellum incl. var. albida, 1884: 18 as C. gilvellum var. albida; Steiner 1893: 169; Sickenberger 1901: 323 as Lecanora gilvella [= gilvella] incl. var. albida.
C. holocarpa (Ach.) A. E. Wade – Nylander 1864: 66, 1876: 282 as L. pyracea f. pyrithroma; Müller 1880b: 44 as Callopolispyracea var. pyrithroma, 1884: 17 as C. pyraceum incl. vars. holocarpum and pyrithroma; Sickenberger 1901: 322 as Lecanora pyracea, 323 as L. holocarpa and L. pyracea var. atroalba, pyrithroma; Galun & Garty 1972: 249. – W of Rossetta, 1988, Seaward (herb. Seaward 105650); W of Alexandria, 1988, Seaward (herb. Seaward 106464). – This species is used here in a wide sense and some Egyptian records may turn out to belong to different taxa.

C. interventiens (Müll. Arg.) Zahlbr. = C. circumalbata

C. lactea (A. Massal.) Claouzade & Rondon* – Müller 1880c: 74 as Callopolis aegyptiacum var. lecideinum; Sickenberger 1901: 324 as Lecanora aegyptiaca var. lecideina; Steiner 1893: 169 as Caloplaca aegyptiaca var. lecideina.

C. minima (Delile) Zahlbr.* – Delile 1813a: 156, 1813b: 33 as Lecidea minima; Steiner 1893: 169 as Caloplaca delilei (nom. nov.).

C. minuscula (Müll. Arg.) Zahlbr.* – Müller 1884: 17 as Callopolis minusculum; Sickenberger 1901: 324 as Lecanora minuscula; Wunder 1974: 144. – Belongs to Lecania according to Wunder (1974).

C. obscurata Choisy – Müller 1884: 17 as Callopolis cerinum var. obscuratum; Sickenberger 1901: 323 as Lecanora cerina var. obscurata.

C. rejecta var. bicolor (Müll. Arg.) Alon & Galun = C. circumalbata var. bicolor

C. saxicola (Hoffm.) Nordin – Nylander 1864: 65 as Placodium murorum; Müller 1880b: 41 as Amphiloma murorum; Sickenberger 1901: 322 as Lecanora murorum.

C. subcerina (Nyl.) Zahlbr.* – Nylander 1876: 282 as Lecanora subcerinum; Müller 1880b: 44 as Callopolis subcerinum; Sickenberger 1901: 323 as Lecanora subcerata.


Candelariella aurella (Hoffm.) Zahlbr. – Nylander 1864: 66, 1876: 282 as Lecanora epixantha; Müller 1880c: 74 as L. epixantha, 1884: 16 as L. subsimilis var. decolorans; Sickenberger 1901: 324 as L. epixantha; Galun & Garty 1972: 247.


Cathapyrenium lacinulatum (Ach.) Breuss = Placodium lacinulatum

C. squamulosum (Ach.) Breuss = Placidium squamulosum


C. sodalis (Stizenb.) Zahlbr. – Sickenberger 1901: 328 as Lecidea sodalis.

Celidium varium Körb. = Arthontia varians

Chiadecton candidum Müll. Arg.* = Dirina immersa

Cladonia alciornis (Licht.) Fr. = C. foliacea

C. convoluta (Lam.) Anders – Sickenberger 1901: 320 as C. endiviaefolia.

C. endiviaefolia auct. = C. convoluta

C. foliacea (Huds.) Willd. – Sickenberger 1901: 320 as C. alciornis.


C. furvum f. conchilobum (Flot.) Müll. Arg. = C. crispus (see Degelius 1954: 282)

C. fuscovirens (With.) J. R. Laundon – Sickenberger 1901: 319 as C. fulvum [= furvum].

C. pulposum Nyl.* = C. tenax

C. pulposum f./var. pulvinatum Nyl.* = C. tenax

C. pulposum (Bernh.) Ach. = C. tenax
C. pulposum var. crustaceum (Schaer.) Rabenh. = C. tenax var. crustaceum

C. tenax (Sw.) Ach. var. tenax – Nylander 1864: 15 as C. pulposum var. crustaceum; Müller 1880b: 40 as C. pulposum incl. f. pulvinatum; Sickenberger 1901: 319 as C. pulposum and C. pulposulum var. pulvinatum; Degelius 1954: 183; Galun & Garty 1972: 243.

C. tenax var. crustaceum (Kremp.) Degel. – Müller 1884: 15 as C. pulposum var. crustaceum; Sickenberger 1901: 319 as C. pulposum var. crustaceum [cf. Degelius 1954: 172].


Collemopsis quinquetubera (Delile) Müll. Arg. = Omphalaria quinquetubera

Cytidula minor – Steiner 1893: 172; LF.

Dermatocarpon aegyptiacum (Müll. Arg.) Zahlbr.* – Müller 1880c: 82 as Verrucaria aegyptiaca, 1884: 20 as Endopyrenium aegyptiacum.

D. hepaticum (Ach.) Th. Fr. = Placidium squamulosum

D. rufescens (Ach.) Th. Fr. = Placidium rufescens


Diploschistes actinostomus (Ach.) Zahlbr. – Müller 1884: 18 as Urceolaria actinostoma.

D. calcarea J. Steiner = D. candidissimus


D. gypsaceus (Ach.) Zahlbr. – Nylander 1864: 68 as Urceolaria scruposa var. gypsacea; Müller 1880c: 77 as U. scruposa var. gypsacea; Sickenberger 1901: 327 as U. gypsacea.

D. steppicus Reichert = D. diacapsis

Diplotomma alboatrum (Hoffm.) Flot. – Nylander 1864: 69 as Lecidea alboatra var. epipolia, 1876: 284 as L. alboatra f. epipolia; Müller 1880c: 79-80, 1884: 18 as D. alboatrum vars. areolatum, epipolium and intermedium; Steiner 1893: 169 as Buellia alboatra var. epipolia; Sickenberger 1901: 329 as Lecidea alboatra var. areolata, epipolia and intermedia; Werner 1966: 76 as Buellia epipolia; Galun & Garty 1972: 248 as B. epipolia; Nordin 2000: 55 as Buellia alboatra; Temina & al. 2005b: 147 as D. epipolium. – E of Alexandria, 1988, Seaward (herb. Seaward 106487, 105783 sub Xanthoria stipigera). – The revision of Buellia species with pluriseptate spores by Nordin (e.g. 2000) resulted in a shift in the interpretation of some common species. Consequently D. epipolia has become a synonym of D. alboatrum, while most specimens named as such belong to D. venustum. Only a reexamination of the underlaying vouchers can clear the status of the Egyptian records, which are here included in D. alboatrum on formal grounds only.

D. alboatrum var. areolatum Müll. Arg.* = D. alboatrum

D. alboatrum var. epipolium A. Massal. = D. alboatrum

D. alboatrum var. intermedium Müll. Arg.* = D. alboatrum

D. alboatrum var. murorum A. Massal. = D. murorum

D. epipolium (Ach.) Arnold = D. alboatrum

D. pharcidium (Ach.) Choisy – Sickenberger 1901: 328 as Lecidea alboatra var. arthroa [= arthroa].

D. murorum (A. Massal.) Coppins – Müller 1880c: 80, 1884: 18 as D. alboatrum var. murorum.


Dirina cretacea (Zahlbr.) Tehler – Roux 1991: 167 map. – This record may be based on a misinterpretation, because Roux (1991) cites as source Tehler (1983), where this species is indicated from Libya, not Egypt.


Endocarpon aegyptorum Auct. = Anapyrenium aegyptiacum
E. hepaticum Ach. = Placidium squamulosum
E. rufoescens Ach. = Placidium rufoescens
Endopyrenium aegyptiacum (Müll. Arg.) Müll. Arg. = Dermatocarpon aegyptiacum
E. hepaticum Körb. = Placidium squamulosum


F. fulgens (Sw.) Elenkin – Nylander 1854: 65 as Placodium fulgens; Müller 1880b: 43 as Placodium fulgens; Sickenberger 1901: 321 as Lecanora fulgens; Galun & Garty 2001: 100.


Gonohymenia sinaica Galun & Marton = Placodium fulgens;

Laestadia (Carlia) cahirensis J. Steiner – Steiner 1893: 171; LF.

Lecania albariella (Nyl.) Müll. Arg. = L. turicensis
L. albariella var. ecrustacea (Nyl.) Müll. Arg.* = L. turicensis
L. albariella var. subcaesia (Nyl.) Müll. Arg.* = L. turicensis

L. athroodes (Nyl.) Müll. Arg.* – Nylander 1876: 283 as Lecanora athroodes incl. var. extrita; Müller 1880c: 77 incl. var. extrita; Sickenberger 1901: 326 as L. arthroades [sic] incl. var. extrita. – 32 km SW of Alexandria, 1968, Moberg 923b (UPS 60940).

L. brachyspora Müll Arg.* – Müller 1880c: 77; Sickenberger 1901: 326 as Lecanora brachyspora.

L. erysibe (Ach.) Mudd var. erysibe – Nylander 1864: 66 as Lecanora erysibe; Müller 1880c: 76, 1884: 16; Sickenberger 1901: 325 as Lecania erysibe.

L. erysibe var. incusa (Körb.) Müll. Arg. – Müller 1880c: 76, 1884: 16; Sickenberger 1901: 325 as Lecanora erysibe var. incusa.


L. subcaesia (Nyl.) de Lésd. – Sickenberger 1901: 326 as Lecanora rabenhorstii var. subcaesia.

– Sinai, Gebel el Heitan, 600 m, 1982, Frahm (B 60 0123661).

L. turicensis (Hepp) Müll. Arg. – Nylander 1864: 67 as Lecanora albariella var. ecrustacea and subcaesia; Nylander 1876: 283 as Lecanora albariella f. subcaesia; Müller 1880c: 76, 1884: 16 as L. albariella var. subcaesia, var. ecrustacea and Thalloidima barbeyanum; Steiner 1893: 169 as Lecanora albariella var. subcaesia; Sickenberger 1901: 325 as Lecanora albariella, 326 as Lecanora albariella var. acrustacea [= ecrustacea], 328 as Lecidea barbeyana; Werner 1966: 76 as Lecania albariella; Mayrhofer 1988: 116; Timdal 1991: 120. – E of Alexandria, 1988, Seaward (herb. Seaward 105795).

Lecanora aegyptiaca Müll. Arg. = Caloplaca circumalbata
L. aegyptiaca var. depauperata Müll. Arg. = Caloplaca circumalbata
L. aegyptiaca var. lecideinea Müll. Arg. = Caloplaca lecideinea

*L. agardhiana* Ach. – Sinai, Gebel el Heitan, 600 m, 1982, Frahm (B 60 0123341).

L. albariella Nyl. = Lecania turicensis
L. albariella var. ecrustacea Nyl.* = L. turicensis
L. albariella f. subcaesia Nyl.* = L. turicensis

L. albescens (Hoffm.) Branth & Rostr. – Sickenberger 1901: 323 as L. galactina.

L. albula (Nyl.) Hue – Sickenberger 1901: 328 as Lecidea albula.
L. athroodes ["arthroades"] Nyl.* = Lecania athroodes
L. athroodes ["arthroades"] var. extrita Nyl.* = Lecania athroodes
L. atra Ach. = Tephromela atra
L. aurantiaca var. erythrella Nyl. = Caloplaca flavovirescens
L. bischoffii var. aegyptiaca (Müll. Arg.) Stizenb. = Rinodina dubyana
L. bischoffii var. melanops Müll. Arg. = Rinodina dubyana
L. brachyspora (Müll. Arg.) Stizenb.* = Lecania brachyspora
L. calcarea (L.) Sommerf. = Aspicilia calcarea
L. calcarea f. farinosa Flörke = Aspicilia farinosa
L. calcarea var. hoffmanni [= hoffmannii] (Ach.) Sommerf. = Aspicilia contorta subsp. hoffmanniana
L. callopisma Ach. = Caloplaca aurantia
L. cerina var. obscurata Nyl. = Caloplaca obscurata
L. cervina Ach. = Acarospora cervina
L. cheresina Müll. Arg.* = Aspicilia cheresina
L. circinata (Pers.) Ach. = Lobothallia radiosa
L. circumalbata (Del.) Stizenb. = Caloplaca circumalbata
L. cirrochroa Ach. = Caloplaca cirrochroa
L. citrina (Hoffm.) Ach. = Caloplaca citrina
L. citrina var. microcarpa Stizenb. = Caloplaca citrina
L. crassa (Huds.) Ach. = Squamarina cartilaginea
L. dealbata var. radicans Nyl. = Acarospora nodulosa var. reagens
L. detrita Ach. – Müller 1880c: 74; Sickenberger 1901: 325.
L. ehrenbergii Müll. Arg. = Caloplaca ehrenbergii
L. epixantha (Ach.) Nyl. = Candelariella aurella
L. erysibe (Ach.) Nyl. = Lecania erysibe
L. erysibe var. incusa (Körb.) Stizenb. = Lecania erysibe var. incusa
L. erythrella Ach. = Caloplaca flavovirescens
L. erythrina Müll. Arg. = Caloplaca erythrina
L. erythrina var. cryptocarpa Müll. Arg. = Caloplaca erythrina var. cryptocarpa
L. erythrina var. pulvinata Müll. Arg. = Caloplaca erythrina var. pulvinata
L. exigua (Ach.) Nyl. = Rinodina exigua
L. farinosa (Flörke) Nyl. = Aspicilia farinosa
L. ferruginella Nyl.* – Nylander 1864: 66; Müller 1880c: 77 as Blastenia ferruginella; Sickenberger 1901: 322. – This species most probably belongs in the genus Caloplaca as currently understood. No formal recombination is proposed here before a re-examination of the type specimen, as it might concern a synonym.
L. fulgens (Sw.) Ach. = Fulgensia fulgens
L. fuscata Auct. = Acarospora atrata
L. galactina Ach. = L. albescens
L. gilvella Nyl.* = Caloplaca gilvella
L. gilvella var. albida Stizenb.* = Caloplaca gilvella
L. holocarpa (Ach.) Nyl. = Caloplaca holocarpa
L. interrupta (Ehrenb.) Nyl.* = Acarospora strigata
L. interventiens Stizenb. = Caloplaca circumalbata
L. lentigera (Weber) Ach. = Squamarina lentigera
L. melanocarpa Müll. Arg. = Caloplaca circumalbata
L. melanocarpa var. bicolor (Müll. Arg.) Stizenb. = Caloplaca circumalbata var. bicolor
L. melanocarpa var. leucoloma Müll. Arg. = Caloplaca circumalbata
L. melanocarpa var. versicolor Müll. Arg. = Caloplaca circumalbata
L. minuscula Müll. Arg. = Caloplaca minuscula
L. muelleri J. Steiner = Aspicilia muelleri
L. murrum (Hoffm.) Ach. = Caloplaca saxicola
L. pinguiscula (Delile) Nyl.* = Lecania ertiary var. pinguiscula
L. placenta Ehrenb.* = Acarospora placenta
L. pruinosa (Sm.) Nyl. = Sarcogyne regularis
L. pyracea (Ach.) Th. Fr. = Caloplaca holocarpa
L. pyracea var. atroralba Müll. Arg. = Caloplaca holocarpa
L. pyracea var. lactea Stizenb. = Caloplaca lactea
L. pyracea var. pyrithroma (Ach.) Nyl. = Caloplaca holocarpa
L. rabenhorstii var. subcaesia Nyl. = Lecania subcaesia
L. rhizophora (Delile) Müll. Arg.* = Aspicilia rhizophora
L. rufescens Ach. = Acarospora rufescens
L. schleicheri f. radicans Nyl.* = Acarospora nodulosa var. reagens
L. simplex Nyl. = Polysporina simplex
L. simplex var. calciifrata (Müll. Arg.) Stizenb.* = Sarcogyne calcifraga
L. simplex f. strepsodina Ach. = Polysporina simplex
L. sophodes var. exigua Ach. = Rinodina exigua
L. subcalcaria Müll. Arg.* = Aspicilia subcalcaria
L. subcerata Stizenb. = Caloplaca subcerina
L. subcerina Nyl.* = Caloplaca subcerina
L. subcoerulea (Delile) Müll. Arg.* = Aspicilia subcoerulea
L. subsimilis Vain. var. decorans Müll. Arg.* = Candelariella aurella
L. sympagea var. exalbata Stizenb. = Caloplaca aurantia
L. sympagea var. exteroleuca A. Massal. = Caloplaca aurantia
L. teicholytum Ach. = Caloplaca teicholyta
L. tricholytta = misspelling for Caloplaca teicholyta
L. umbrina (Ach.) A. Massal. – Nylander 1876: 283, Müller 1880c: 75, Sickenberger 1901: 325
as L. umbrina var. cyanescens.
L. umbrina var. cyanescens Pers. = L. umbrina
Lecidea albitabla (Dufour) Dufour = Psora vallesiaca
L. alboatra var. areolata Stizenb. = Diplostomma alboatra
L. alboatra var. arthroa [= arthroa] Ach. = Diplostomma pharcidium
L. alboatra var. epipolia (Ach.) Schaer. = Diplostomma alboatra
L. alboatra var. intermedia Stizenb. = Diplostomma alboatra
L. albula Nyl. = Lecanora albula
L. barbeyana Müll. Arg. = Lecania turicensis
L. canescens (Dicks.) Ach. = Diploicia canescens
L. circumalbata Delile* = Caloplaca circumalbata
L. decipiens (Hedw.) Ach. = Psora decipiens
L. disciformis var. albuila Nyl. = Buellia subalbuila
L. dispersa (A. Massal.) Nyl. = Buellia dispersa
L. geoleuca Nyl.* = Toninia aromatica
L. minima Delile* = Caloplaca minima
L. pruinosa Nyl. = Sarcogyne regularis
L. simplex Nyl. = Polysporina simplex
L. simplex var. calciifrata Müll. Arg.* = Sarcogyne calcifraga
L. quinquetubera Delile* = Omphalia quinquetubera
L. sodalis Stizenb. = Catillaria sodalis
L. subalbula Nyl. = Buellia subalbula
**L. vetusta** Delile* – Delile 1813a: 158, 1813b: 33. – According to Müller (1980b: 83) perhaps *Buellia* sp. or *Blastenia melanocarpa*.


**Lobothallia radiosa** (Hoffm.) Hafellner – Steiner 1893: 169 as *Lecanora circinata*; Sickenberger 1901: 325 as *L. circinata*.

**Lycalyssa arabica** = misspelling for *Synalissa arabica*

**Melanographa hypoleuca** (Müll. Arg.)* = *Melaspilea hypoleuca*


**Microthelia pharaonis** Müll. Arg.* – Müller 1880c: 81; Sickenberger 1901: 331 as *Verrucaria pharaonis*. – According to Hawksworth (1985: 160) probably a synonym of *Endoccus propinquus* (Körb.) D. Hawksw; LF.

**Omphalaria arabica** Müll. Arg. = *Peccania arabica*

**O. pulvinata** Nyl. = *Thyrea confusa*

**O. quinquetubera** Müll. Arg.* – Delile 1813a: 157, 1813b: 33 as *Lecidea quinquetubera*; Müller 1880b: 40, 1884: 15; Sickenberger 1901: 320 as *Collemopsis quinquetubera*. – Schultz (pers. comm.) informed us that the genus name is not valid and the species is perhaps attributable to *Psrortichia*.


**Parmelia maciformis** Delile = *Ramalina maciformis*

**P. miniata** Ach. = *Caloplaca arnoldii*

**P. paretina** Ach. = *Xanthoria paretina*

**P. pinguiscula** Delile* = *Lecania erysibe* var. *pinguiscula*

**Peccania arabica** (Müll. Arg.) Henssen – Müller 1891: 371 as *Omphalaria arabica*; Galun & Garty 1972: 243 as *Thyrea arabica*.

**Physcia astroidea** Nyl. = *P. clementei*

**P. clementei** (Turner) Maas Geest. – Müller 1880b: 41 as *P. astroidea*; Sickenberger 1901: 321.

**P. magara** Kremp. = *Seirophora villosa*

**P. paretina** (L.) De Not. = *Xanthoria paretina*

**P. paretina** var. *aureola* (Ach.) Nyl. = *Xanthoria calcicola*

**P. paretina** var. *ectanea* (Ach.) Nyl. = *Xanthoria ectaneoides*

**P. paretina** var. *imbricata* A. Massal. = *Xanthoria paretina*

**P. paretina** var. *subgranulosa* Nyl.* = *Xanthoria paretina* var. *subgranulosa*

**P. polycarpa** Nyl. = *Xanthoria polycarpa*

**P. polycarpa** f./var. *brevis* [= *brevior*] Nyl. = *Seirophora villosa*


**P. rufescens** (Ach.) A. Massal. – Nylander 1864: 69 as *Endocarpon rufescens*; Galun & Garty 1972: 243 as *Dermatocarpon rufescens*. – This species is not indicated for Egypt by Breuss (1994) and the records may be misidentifications.


**Placodium callopismum** (Ach.) Mérat = *Caloplaca aurantia*

**P. cervinum** (Ach.) Müll. Arg. = *Acarospora cervina*

**P. citrinum** (Hoffm.) Hepp = *Caloplaca citrina*
P. crassum var. deserti (Nyl.) Müll. Arg. = Squamarina cartilaginea
P. fulgens (Sw.) DC. = Fulgensia fulgens
P. interruptum Müll. Arg. = Acarospora strigata
P. lentigerum f. deserti (Nyl.) Müll. Arg. = Squamarina cartilaginea
P. murorum (Hoffm.) DC. = Caloplaca saxicola
P. rufescens (Nyl.) Müll. Arg. = Acarospora rufescens
P. schleicheri f. radicans (Nyl.) Müll. Arg.* = Acarospora nodulosa var. reagens

Polyspora simplex (Davies) Vézda – Nylander 1864: 67 as Lecanora simplex f. strepsodina;
Müller 1880c: 79 as Lecidea simplex; Sickenberger 1901: 327 as Lecanora simplex; Galun & Garty 1972: 243 as Biatorella simplex var. strepsodina.


P. taposirica (Sitzenb.) Zahlbr.* – Sitzenberger 1895: 259 as Verrucaria taposirica.

Psora decipiens (Hedw.) Hoffm. – Nylander 1864: 68 as Lecidea decipiens; Müller 1880b: 43; Sickenberger 1901: 328 as L. decipiens; Galun & Garty 1972: 245 as L. decipiens, 2001: 100.


Psorotichia schaereri (A. Massal.) Arnold – Werner 1966: 76.


R. crispatula Nyl. – Müller 1884: 15; Sickenberger 1901: 320. – Schweinfurth (FH).

R. duriae (De Not.) Jatta = R. lacera
R. evernioides Nyl. = R. lacera

R. lacera (With.) J. R. Laundon – Müller 1880b: 40, 1884: 15, 1891: 373 as R. evernioides;
Sickenberger 1901: 320 as R. evernioides; Galun & Garty 1972: 243, 248 as R. duriae;
Temina & al. 2005b: 266.

R. maciformis (Delile) Bory – Delile 1813a: 144, 1813b: 33 as Parmelia maciformis; Nylander 1864: 64; Müller 1880b: 40, 1891: 373; Sickenberger 1901: 320; Galun & Garty 1972: 247; Temina & al. 2005b: 267 – Sinai, Gebel el Heitan, 600 m, 1982, Frahm (B 60 004733); Mt Mokattam near Cairo, 1891, Sickenberger in Arnold Exs. 1539 (B); Wadi Angabia, 1964, Steiner & Boulos, Crypt. Exs. Vindob. 4832 (B).

R. pollinaria (Westr.) Ach. – Nylander 1864: 64; Sickenberger 1901: 320.

Rinodina bischoffii var. aegyptiaca Müll. Arg.* = R. dubyana
Rinodina bischoffii var. melanops Müll. Arg.* = R. dubyana
R. dubyana (Hepp) J. Steiner – Müller 1880c: 77 as var. aegyptiaca and melanops; Sickenberger 1901: 325 as Lecanora bischoffii var. aegyptiaca and melanops; Galun & Garty 1972: 248 as Rinodina bischoffii var. aegyptiaca; Mayrhofer & Poelt 1979: 94; Mayrhofer 1984: 407. – Schweinfurth (FH).

R. exigua (Ach.) Gray – Nylander 1864: 66 as Lecanora sophodes var. exigua; Müller 1880c: 77; Sickenberger 1901: 324 as L. exigua.


R. tinctoria DC. – Sickenberger 1901: 320. – This species is often erroneously reported and unlikely to occur in Egypt; therefore it can be assumed that the report most likely refers to R. phycopsis.

Sarcogyne calcifraga (Müll. Arg.) H. Magn.* – Müller 1880c: 79 as Lecidea simplex var. calcifraga; Sickenberger 1901: 327 as Lecanora simplex var. calcifraga.

S. regularis Körb. – Müller 1880c: 79 as Lecidea pruinosa; Sickenberger 1901: 327 as Lecanora pruinosa.

S. villosa (Ach.) Frödén – Nylander 1864: 65 as Physcia villosa f. brevior; Krempelhuber 1868: 323 as Physcia magara; Müller 1880b: 41 as Theloschistes villosus, 1884: 15 as T. villosus f. brevior; Sickenberger 1901: 320 as Physcia villosa incl. var. brevis [= brevior], 1901: 321 as Physcia magara; Poelt 1983: 440 as Seirophora magara; Frödén & Lassen 2004: 297. – Schweinfurth (FH). – Specimens identified as var. brevior may belong to S. lacunosa, since these taxa have been confused.

Squamarina lentigera f. deserti (Ehrenb.) Nyl.* = Squamarina lentigera


S. cartilaginea var. pseudocrassa (Mattick) D. Hawksw. = S. cartilaginea

S. crassa (Huds.) Poelt var. crassa = S. cartilaginea

S. crassa var. crassa f. pseudocrassa (Matt.) Poelt = S. cartilaginea


Stigmidium congestum (Körb.) Triebel – Müller 1884: 20 as Anthopyrenia epicymatica; LF.


Teloschistes brevior (Nyl.) Vain. = Seirophora lacunosa

T. lacunosus (Rupr.) Savicz = Seirophora lacunosa

T. [as Theloschistes] parietinus var. aureolus Müll. Arg. = Xanthoria calcicola

T. [as Theloschistes] parietinus var. ectaneus Müll. Arg. = Xanthoria ectaneoides

T. [as Theloschistes] parietinus var. imbricatus Müll. Arg. = Xanthoria paretina

T. [as Theloschistes] parietinus var. polycarpus Müll. Arg. = Xanthoria polycarpa

T. [as Theloschistes] parietinus var. subgranulosus Müll. Arg. = Xanthoria paretina var. subgranulosus

T. [as Theloschistes] villosus (Ach.) Norman = Seirophora villosa

T. [as Theloschistes] villosus f. brevior Müll. Arg. = Seirophora villosa

Tephromela atr a (Huds.) Hafellner – Galun & Garty 1972: 246 as Lecanora atra.

Thalloidima barbeyanum Müll. Arg.* = Lecanaria turicensis

T. geoleucum (Nyl.) Müll. Arg.* = T. aromatic a

Thelidium pauperculum Müll. Arg.* – Müller 1880c: 82; Sickenberger 1901 as Verrucaria paupercula.


Thyrea arabica (Müll. Arg.) Zahlbr. = Peccania arabica

Thyrea confusa Henssen – Nylander 1864: 64 as Omphalaria pulvinata; Galun & Garty 1972: 243 as Thyrea pulvinata. – The synonymy follows the observation of Henssen & Jørgensen (1990) that the type specimen of Thyrea pulvinata belongs to a different species as most material names so, for which they proposed a new name. The actual identity of the Egyptian records needs verification.

T. pulvinata auct. = T. confusa


T. albomarginata de Lesd. = T. albilabra

T. aromatic a (Sm.) A. Massal. – Nylander 1864: 69 as Lecidea geoleuca; Müller 1880b: 43 as Thalloidima geoleucum; Sickenberger 1901: 328 as Lecidea geoleuca; Galun & Garty 1972: 246, 2001: 100; Timdal 1991: 39.
T. coeruleonigricans (Lightf.) Th. Fr. = T. sedifolia

**Tornabenia scutellifera** (With.) J. R. Laundon – Galun & Garty 1972: 248 as Tornabenia intricata.

*Tornabenia intricata* Trevis. = *Tornabenia scutellifera*

Urceolaria actinostoma (Ach.) Ach. = Diplochistes actinostomus

U. actinostoma var. calcarea Müll. Arg. = Diplochistes candidissimus

*U. conferta* Delile* = Delile 1813a: 155, 1813b: 33. – The identity of this species is not clear; it may be Buellia sp. according to Müller 1880c.

*U. gypsacea* Ach. = Diplochistes gypsaceus

U. rhizophora Delile* = Aspicilia rhizophora

U. scruposa var. gypsacea (Ach.) Flot. = Diplochistes gypsaceus

*U. subcoerulea* Delile* = Aspicilia subcoerulea

**Usnea pinkertonii** (Stirt.) Motyka a Pinkerton 1881 (BM); Motyka 1936: 135. – The record is doubtful, because the genus is unlikely to occur in an inland desert.

**Verrucaria aegyptiacum** Müll. Arg.* = Dermatocarpon aegyptiacum


*V. aschersonii* (Müll. Arg.) Stizenb.* = Porina aschersonii

*V. hochstetteri* Fr. – Müller 1884: 20 as V. obtecta; Sickenberger 1901: 330 as V. obtecta.

*V. integra* Nyl. = V. pinguicula

V. integra f. limitans Nyl.* = V. pinguicula

V. obtecta Müll. Arg.* = V. hochstetteri

*V. paupercula* Stizenb.* = Thelidium pauperculum

*V. pharaonis* (Müll. Arg.) Stizenb.* = Microthelia pharaonis

*V. pinguicula* A. Massal. – Nylander 1864: 69 as V. integra f. limitans; Müller 1880c: 82 as V. integra f. limitans, 1884: 20 as V. integra; Sickenberger 1901: 330 as V. integra, f. limitans.

*V. taposirica* Stizenb.* = Porina taposirica

**Xanthoria aureola** var. isidioidea Beltr. = X. stiligera

**X. calcicola** Oxner – Müller 1884: 15 as Thelochistes parietinus var. aureolus; Sickenberger 1901: 321 as Physcia parietina var. aureola; Galun & Garty 1972: 249 as X. aureola.

**X. ectaneoides** (Nyl.) Zahlbr. – Nylander 1864: 65 as Physcia parietina var. ectanea; Müller 1880b: 41 as Thelochistes parietina var. ectaneus; Sickenberger 1901: 321 as P. parietina var. ectanea.


**X. microspera** de Lesd. – Lamb 1963: 804.

**X. parietina** (L.) Th. Fr. – Delile 1813b: 33 as Parmelia parietina; Nylander 1864: 65 as Physcia parietina; Müller 1980b: 41 as Thelochistes parietina incl. imbricatus; Sickenberger 1901: 320 as P. parietina incl. var. imbricata, 321 as P. parietina f. [var.] virescens; Galun & Garty 1972: 249. – 60 km from Alexandria towards Cairo, 1968, Moberg 921, 923a (UPS).

**X. parietina** var. subgranulosa (Nyl.) Zahlbr.* – Nylander 1876: 281 as Physcia parietina var. subgranulosa; Barbey 1880 (FH); Müller 1880b: 41, 1884: 4 as Thelochistes parietinus var. subgranulosa; Sickenberger 1901: 321.

**X. polycarpa** (Hoffm.) Rieber – Müller 1884: 15 as Thelochistes parietinus var. polycarpus; Sickenberger 1901: 321 as Physcia polycarpa; Galun & Garty 1972: 243.


**X. stiligera** Giralt & al. – Galun & Garty 1972: 249 as X. aureola var. isidioidea; Giralt & al. 1993: 283. – E of Alexandria, 1988, Seaward (herb. Seaward 105783). – Note: Giralt & al. (1993) conclude that the identity of X. aureola var. isidioidea is unclear. Their treatment suggests that material named as such by Galun & Garty belongs to X. stiligera. However, Temina & al. (2005b) report the related X. mediterranea from Egypt.
Species reported as available for sale (“venalis”) in markets in Egypt

*Evernia prunastri* (L.) Ach. – Nylander 1864: 64.  
*Pseudevernia furfuracea* (L.) Zopf – Nylander 1864: 64 as *Evernia furfuracea*.  
*Ramalina calicaris* (L.) Fr. – Nylander 1864: 64.

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