

## Additions and notes to the checklist of lichens and lichenicolous fungi of Cape Verde

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**Abstract:** Thirty-six taxa of lichens and lichenicolous fungi are reported as new to the Cape Verdean Islands. Some rare species are also mentioned in the annotated list. Two species are described as new: *Polycoccum atrostriatae* and *Thelopsis africana*. *Caloplaca phlogina*, *Didymellopsis perigena*, *Graphis cincta* and *Thelopsis flaveola* are new to Africa. Short descriptions about ecology and distribution of most taxa are provided.

A fieldtrip in 2006 by the author and his wife resulted so far in four papers, GIRALT & VAN DEN BOOM (2008), LLOP & VAN DEN BOOM (2009), ARUP & VAN DEN BOOM (2011) and ERTZ & VAN DEN BOOM (2012). The former regards *Rinodina* on Cape Verde, including three newly described species. The second treats *Bacidia* s.l. in the archipelago, in the third, three new black-fruited *Caloplaca* species are described and in the latter a new *Plectocorpon* is described. In the present paper thirty-six lichens and lichenicolous fungi are recorded as new for the archipelago and some further rare species are mentioned in the list. Lichenicolous fungi are very poorly known in Africa except in the Canary Islands from where quite a lot of species are mentioned in HERNÁNDEZ PADRÓN (2009). Beside that, in more recent studies, several new records are mentioned from the Canary Islands (VAN DEN BOOM 2010, VAN DEN BOOM & ERTZ 2012). A further important paper in which many crustose lichens and lichenicolous fungi can be found (1100 taxa), is the checklist of Morocco (EGEA 1996).

### Materials and methods

Six hundred specimens of lichens and lichenicolous fungi have been collected on three islands of the Cape Verdean archipelago: Santiago, São Vicente and Santo Antão. A great part of them is already identified. Taxa not mentioned in the checklist of MIES (1993) or in more recent papers are treated in the annotated list below. Some specialists (see acknowledgements) have identified critical specimens of some genera. All the material is hosted in the herbarium of the author except two holotype specimens which are in BCN. Photographs of habitus and ascospores are provided for two new species (Figs. 1, 2).

### Localities visited

#### Santiago

- 1) W of São Domingos, Rui Vaz, centre of village, 23° 36.0' W - 15° 02.1' N, 825 m s. m., 7. 7. 2006.
- 2) W of São Domingos, S side of Rui Vaz, 23° 35.8' W - 15° 01.7' N, 815 m s. m., 7. 7. 2006.

- 3) W of São Domingos, WNW of Rui Vaz, "Monte Tchopa", near telecommunication station, 23° 37.5' W - 15° 02.2' N, 1085 m s. m., 8. 7. 2006.
- 4) W of São Domingos, WNW of Rui Vaz, along path to "Monte Tchopa", E of telecommunication station, 23° 37' W - 15° 02' N, 1035 m s. m., 8. 7. 2006.
- 5) W of São Domingos, N of Rui Vaz, along village, 23° 35.7' W - 15° 02.3' N, 855 m s. m., 9. 7. 2006.
- 6) W of Praia, Cidade Velha, coastal area, 23° 36.1' W - 14° 55.0' N, 125 m s. m., 12. 7. 2006.
- 7) SE of Tarrafal, along the road to Fundura, N of Fundura, c. 1 km S of crossing with road to Ribeira Prata, 23° 43.3' W - 15° 14.1' N, 105 m s. m., 13. 7. 2006.
- 8) SE of Tarrafal, along the road to Fundura, N of Fundura, N side of Serra Malagueta, 23° 42.0' W - 15° 12.5' N, 640 m s. m., 13. 7. 2006.
- 9) SE of Tarrafal, along the road to Fundura, N of Fundura, S side of Serra Malagueta, vertical outcrops, 23° 41.5' W - 15° 10.8' N, 855 m s. m., 13. 7. 2006.
- 10) SE of Tarrafal, along the road to Fundura, S rim of Serra Malagueta, N of Fundura, 23° 41.6' W - 15° 10.5' N, 675 m s. m., 13. 7. 2006.
- 11) SE of Assomada, along the road to Praia, between Picos and João Teves, 23° 37.4' W - 15° 04.5' N, 460 m s. m., 13. 7. 2006.

#### São Vicente

- 12) Monte Verde, just below top of the mountain, 24° 56.0' W - 16° 52.2' N, 700 m s. m., 15. 7. 2006.

#### Santo Antão

- 13) S of Ribeira Grande, NW of Corda, trail (205) in NW direction, to Figueiral, 25° 05.4' W - 17° 08.3' N, 970 m s. m., 17. 7. 2006.
- 14) S of Ribeira Grande, Corda, centre of village, 25° 05.3' W - 17° 07.9' N, 1060 m s. m., 17. 7. 2006.
- 15) S of Ribeira Grande, SE of Corda, trail (203) from Chã de Mato to Losnã, outcrops near Chã de Mato, 25° 04.7' W - 17° 07.6' N, 1095 m s. m., 18. 7. 2006.
- 16) S of Ribeira Grande, SE of Corda, N of trail 203, from Chã de Mato to Losnã, small (secondary) trail to Fajã de Baixo, 25° 04.5' W - 17° 08.1' N, 975 m s. m., 18. 7. 2006.
- 17) S of Ribeira Grande, SE of Corda, N of trail 203, from Chã de Mato to Losnã, small (secondary) trail, N of Fajã de Baixo, to Ribeira de Torre, near plantation, 25° 04.1' W - 17° 08.5' N, 350 m s. m., 18. 7. 2006.
- 18) SW of Ponta do Sol, Fontainhas, S side above village, 25° 06.2' W - 17° 11.2' N, 245 m s. m., 20. 7. 2006.
- 19) SW of Ponta do Sol, Fontainhas, S side of village, small road to Ponta do Sol, 25° 06.2' W - 17° 11.6' N, 215 m s. m., 20. 7. 2006.
- 20) SW of Vila das Pombas, Figueiral de Paúl, SW part of the valley, Chã de Padre, small coffee plantation, 25° 03.0' W - 17° 07.0' N, 195 m s. m., 21. 7. 2006.
- 21) SW of Vila das Pombas, Figueiral de Paúl, NE part of the valley, area of Lombo de Luzia, different plantations, 25° 02.7' W - 17° 07.8' N, 180 m s. m., 21. 7. 2006.
- 22) SW of Ribeira Grande, Ribeira de Duque, trail 205a, southern part, between Chã de Rocho and Meio de Questin, 25° 05.3' W - 17° 09.8' N, 160 m s. m., 22. 7. 2006.
- 23) SE side of Ponta do Sol, edge of village, 25° 05.5' W - 17° 11.8' N, 100 m s. m., 23. 7. 2006.

### Species list

#### ***Agonimia opuntiella* (BUSCHARDT & POELT) VĚZDA**

Loc. 14, roadside trees and outcrops along main road, on trunk of a *Pinus* tree.

This rather small and inconspicuous lichen is known from the Canary Islands and was published for the first time from Lanzarote by BARRENO & RICO (1985). There it is not rare (specimens from several islands in herbarium VAN DEN BOOM) and always collected from rocks. The Cape Verdean collection from *Pinus* is rather unique.

#### ***Arthonia diploiciae* CALATAYUD & DIEDERICH**

Loc. 12, NW slope with acidic outcrops, shrubs and ± scattered small trees, on acidic outcrops, on *Diploicia canescens*.

After the description of *A. diploiciae* (CALATAYUD & al. 1995) it appeared to be a common species in southern Europe (Mediterranean area) and the Canary Islands (VAN DEN BOOM & ETAYO 2006).

***Arthonia phaeophysciae* GRUBE & MATZER**

Loc. 14, outcrops and roadside trees along main road, on *Pinus*, on *Phaeophyscia orbicularis*; Loc. 15, on acidic rock on *Phaeophyscia* spec.; Loc. 20, scattered mixed trees, acidic outcrops and walls, on acidic rocks, on *Phaeophyscia* spec.

This species is easily overlooked because it grows mainly on one of the most common lichens where it is inconspicuous. It is very common in many places in western Europe. Recently it was recorded for the first time from the Canary Islands by VAN DEN BOOM & ERTZ (2012).

***Caloplaca canariensis* (FOLLM. & POELT) BREUSS**

Loc. 14, epiphytic on cf. *Acacia* tree.

This species is known from several islands in the Canary archipelago, but so far only terricolous and saxicolous (BREUSS 2001). It was found abundantly growing close to two other *Caloplaca* species, *C. cf. confusa* and *Caloplaca* spec. (lobulate).

***Caloplaca carphinea* (FR.) JATTA**

Loc. 7, E exposed sloping outcrops along road, on acidic outcrop.

*Caloplaca carphinea* was found only once. It can easily be confused with *C. scoriophila*, which is very common in the study area. *Caloplaca carphinea* is not rare in the Canary Islands (HERNÁNDEZ PADRÓN 2009).

***Caloplaca demissa* (KÖRB.) ARUP & GROBE**

Loc. 21, an area with scattered mixed trees, acidic outcrops and walls, on a NW exposed, acidic outcrop.

*Caloplaca demissa* is easily overlooked because of its habitat. This collection grew on vertical shaded rock, but more often it is found on overhanging rocks. It is known from the Canary Islands (HERNÁNDEZ PADRÓN 2009).

***Caloplaca flavorubescens* (HUDS.) J. R. LAUNDON**

Loc. 21, an area of scattered mixed trees, acidic outcrops and walls, on a mature *Mangifera* tree.

This corticolous species is not rare in Europe and known from most of the Canary Islands (HERNÁNDEZ PADRÓN 2009).

***Caloplaca phlogina* (ACH.) FLAGEY**

Loc. 12, NW exposed slope with acidic outcrops, shrubs and ± scattered small trees, on decaying leaves of an Agave.

In the recent treatment of the *Caloplaca citrina* group (ARUP 2006) this species is described from southern Scandinavia. It occurs in large areas of Europe, corticolous as well as lignicolous.

***Candelaria crawfordii* (MÜLL. ARG.) P. M. JØRG. & D. J. GALLOWAY**

Loc. 13, an area with terrace cultivation, many walls, some outcrops and ± scattered

trees, under N exposed, overhanging outcrops.

In MIES (1993) the only *Candelaria* from Cape Verde is *C. quintanilhae* C. TAVARES. In JØRGENSEN & GALLOWAY (1992) it is mentioned that this species is synonymous with *C. crawfordii* and known from Cape Verde without studying that material. Here it is confirmed.

***Chionosphaera cf. apobasidialis* COX**

Loc. 12, NW slope with acidic outcrops, shrubs and ± scattered small trees, on a unidentified shrub, on *Bacidia*.

This taxon is similar to the one reported from the Canary Islands (Gomera) by ETAYO (1996).

***Cladonia pyxidata* (L.) HOFFM.**

Loc. 15, an area with outcrops, shrubs and small trees, on acidic outcrops.

Although this is a very common species, it was not mentioned in MIES (1993).

***Coccocarpia palmicola* (SPRENGEL) ARV. & GALLOWAY**

Loc. 21, scattered mixed trees, acidic outcrops and walls, on NW exposed vertical outcrops.

This species is recorded in the checklist of Cape Verde (MIES 1993) based on a record from Tavares. However, MIES did not collect this species. *Coccocarpia palmicola* is often found corticolous in tropical areas. Our record is rather poor and from a sheltered and shaded spot.

***Didymellopsis perigena* (NYL.) GRUBE & HAFELLNER**

Loc. 2, low S exposed outcrops along field and steep N exposed outcrops on top of a hill, on acidic outcrops, on *Endocarpon*.

This species was abundantly present on the squamules of an *Endocarpon* species, most probably *E. pusillum*.

***Endococcus propinquus* (KÖRB.) D. HAWKSW.**

Loc. 2, low S exposed outcrops along field and steep N exposed outcrops on the top of a hill, on S exposed outcrop, on a crust.

This is a very common species with a wide distribution, previously known from all continents except Africa (KAINZ & TRIEBEL 2004). However it is recorded from the Canary Islands (La Palma) in HERNÁNDEZ PADRÓN (2009).

***Flakea papillata* O. E. ERIKSS.**

Loc. 2, low S exposed outcrops along a field and steep N exposed outcrops on top of a hill, on acidic outcrops.

This species is widespread in tropical areas where it can form mass vegetations. Only a small specimen was collected on Cape Verde.

***Graphis cincta* (PERS.) APTROOT**

Loc. 5, on a rocky mountain, with some shrubs, on unidentified shrubs.

*Graphis cincta* was previously known from tropical areas in the Caribbean, South America, as well as SE Asia (LÜCKING & al. 2009).

***Ionaspis aff. lavata* H. MAGN.**

Loc. 5, on a rocky mountain, with some shrubs, on acidic outcrops; Loc. 11, on acidic outcrops; Loc. 15, area with outcrops, shrubs and small trees, on acidic outcrops.

This taxon has been reported from the Canary Islands, La Palma (VAN DEN BOOM 2007). The material is identical; however the La Palma material was collected from a wall.

***Lecanactis canariensis* VAN DEN BOOM & ETAYO**

Loc. 12, NW slope with acidic outcrops, shrubs and ± scattered small trees, on NE exposed vertical acidic outcrops.

This species was previously only known from the Canary Islands (La Palma, Fuerteventura), from similar habitats (VAN DEN BOOM & ETAYO 2006).

***Lichenodiplis lecanorae* (VOUAUX) DYKO & D. HAWKSW.**

Loc. 4, hilly area with mixed trees, on *Mangifera*, on *Lecanora*.

This species is very common in many areas and according to DIEDERICH (2004) possibly cosmopolitan. So far the African records were from the Canary Islands (HERNÁNDEZ PADRÓN 2009).

***Lichenostigma episulphurella* ETAYO & VAN DEN BOOM**

Loc. 15, area with shrubs and small trees on acidic outcrops, on *Lecanora sulphurella*.

This species was recently described from the Canary Islands (VAN DEN BOOM & ETAYO 2006), where it is a common species on an extremely common host. The host species is not really common in Cape Verdean Islands.

***Opegrapha foreaui* (MOREAU.) HAFELLNER & R. SANT.**

Loc. 20, area with scattered mixed trees, acidic outcrops and walls, on Coffee trunk, on *Physcia atrostriata*.

Previously, this species was known from the thallus of the host *Heterodermia leucomela* (HAFELLNER 2002) in the Canary Islands (El Hierro). According to DIEDERICH (2003) it is a relatively common species in America.

***Opegrapha subelevata* NYL.**

Loc. 5, on a rocky mountain, with some shrubs, on N exposed steep acidic rocks; Loc. 8, on overhanging acidic outcrops; Loc. 12, on NW exposed slightly overhanging acidic rocks.

It is already known from Africa, from several records in Morocco (EGEA 1996).

***Parmotrema grayanum* (HUE) HALE**

Loc. 13, area with terrace cultivation, many walls, some outcrops and ± scattered trees, on acidic stones of a wall.

This pantropical species is widely distributed in Africa from the Canary Islands to southeastern areas (SWINSCOW & KROG 1988), but it was not mentioned in MIES (1993).

***Physcia albata* (WILS.) HALE**

Loc. 13, area with terrace cultivation, many walls, some outcrops and ± scattered trees,

on S exposed vertical wall.

*Physcia albata* has a worldwide distribution and is known from Chile, Peru and Australia. It is fairly common in subtropical parts of East Africa (MOBERG 1986, 1990). Here it is recorded as new for western Africa.

### ***Physcia poncinsii* HUE**

Loc. 1, mixed trees and outcrops along the road, on *Casuarina equisetifolia*.

According to SWINSCOW & KROG (1988), *Physcia poncinsii* is widely distributed in eastern Africa. It is new for western Africa.

### ***Physcia solediosa* (VAIN.) LYNGE**

Loc. 4, hilly area with mixed trees, on *Hibiscus*.

In MOBERG (2002) this species is mentioned from Mexico and the world distribution is South America, southeastern Asia and eastern Africa. It is new for western Africa.

### ***Polycoccum atrostriatae* VAN DEN BOOM, spec. nova (Fig. 1)**

Mycobank MB 800831

*Polycocco pulvinato* (EITNER) R. SANT. similis, sed differt in ascomatibus 40-70 µm diam., ascosporis ellipsoideis, 8,5-12 × 4,5-5,5(-6) µm, habitat in gallis inductis in thallo lichenis *Physcia atrostriata*.

**Typus:** Cape Verde, Santiago, W of São Domingos, WNW of Rui Vaz, along path to "Monte Tchopa", E of telecommunication station, hilly area with mixed trees, 23° 37' W - 15° 02' N, 1035 m s. m., 8. 7. 2006, on a mature *Grevillea* tree, on *Physcia atrostriata* MOBERG, leg. P. & B. VAN DEN BOOM 36453 (holotype in BCN; isotype in herbarium VAN DEN BOOM).

**Description:** Ascomata lichenicolous, perithecioid, subglobose to globose, immersed, ostiole and surrounding visible, in section 40-70 µm in diam.; ascomatal wall pale to medium brown, ca. 4-8 µm thick, composed of 3-5 layers of elongate cells, cells 6-11 × 2.5-3 µm; hamathecial filaments present at maturity, abundantly branched and anastomosing, 1-1.5 µm thick, I-; asci cylindrical, 8-spored, 45-60 × 8-10 µm, I- in all parts; ascospores oblique monostichously arranged in the asci, ellipsoid to slightly clavate, not or slightly constricted at septum, when young hyaline to pale brown with a perispore, dark brown and coarsely verrucose when mature, 1-septate, 8.5-12 × 4.5-5.5(-6) µm; conidiomata pycnidial, rarely found, 30-70 µm in diam., brown in upper part, pale below; conidia hyaline, bacilliform 4-5 × 0.8-1 µm.

Host: corticolous on *Physcia atrostriata*. It does no damage to the host; however the colour of the host turns slightly paler.

Etymology: The epithet refers to the host species, *Physcia atrostriata*.

Ecology and distribution: In Cape Verde, the new species is known from two localities, in the south and the north on one island (Santiago) occurring on *Physcia atrostriata*, on several different trees. Accompanying lichens in the type locality are: *Bacidia atlantica* (MÜLL. ARG.) ZAHLBR., *B. laurocerasi* (NYL.) VAINIO, *B. polychroa* (TH. FR.) KÖRB., *Leptogium cyanescens* (ACH.) KÖRB., *Normandina pulchella* (BORRER) NYL., *Physcia erumpens* MOBERG, *P. solediosa* (VAIN.) LYNGE, and *Teloschistes flavicans* (SWARTZ) NORMAN (fertile).

**Discussion:** Many species of the genus *Polycoccum* are host specific or at least confined to a group of related species (ATIENZA & al. 2003). This is reflected in a re-



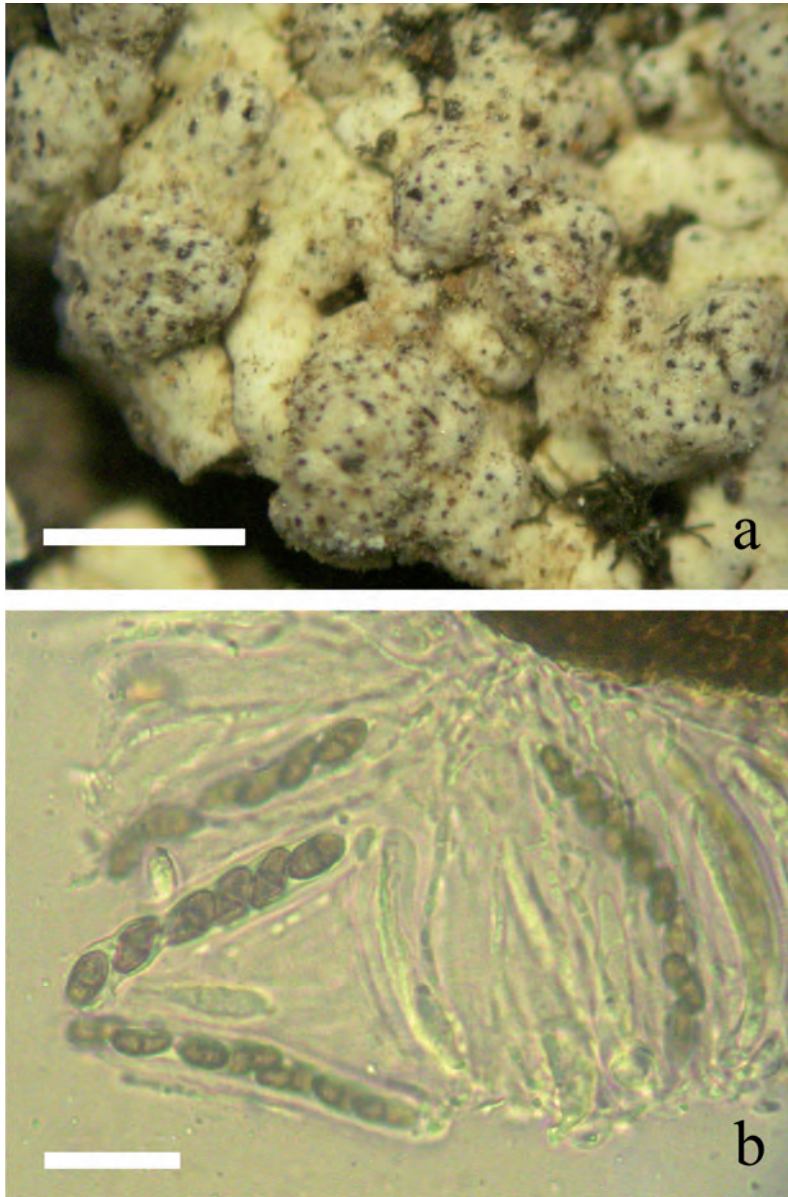


Fig. 1. *Polycoccum atrostriatae* (holotype). a Habitats, b ascospores. Bars: a 0.5 mm, b 20  $\mu$ m.

cent study (VAN DEN BOOM 2010) where *P. rinodinae* has been found on different *Rinodina* species, *R. beccariana* BAGL. s. str., *R. beccariana* var. *lavicola* (M. STEINER) MATZER & H. MAYRHOFER, and *R. etayoi* GIRALT & VAN DEN BOOM. These host species are common in the Canary Islands and in the Iberian Peninsula, except *R. etayoi* which is only known in the Canary Islands where it is rare. The only other known *Polycoccum* species on *Physciaceae* is *P. pulvinatum* (EITNER) R. SANT., known from several *Physcia* species, e.g., often collected on saxicolous *Physcia caesia* (many collections in the herbarium of the author). It induces wart-like galls and has larger perithecia of 150-200 µm in diam., semiimmersed and ellipsoid, much larger ascospores of 18-21 × 7.5-8.5 µm and is different in shape. Similar *Polycoccum* species, with ascospores < 150 µm and 8-spored asci are *P. decolorans* CALATAYUD & TRIEBEL, *P. microsticticum* (LEIGHT.) ARNOLD and *P. rubellianae* CALATAYUD & V. ATIENZA. These species have differently sized ascospores: 18-22 × 6-8 µm, 14-18 × 7-8 µm, and 11-14 × 6-7 µm, respectively, and they all are known from different host genera, *Immersaria*, *Acarospora* and *Caloplaca*, respectively. *Polycoccum* species with relatively small ascospores are *P. rubellianae*, *P. peltigerae* (FUCKEL) VĚZDA and *P. kernerii* STEINER, but the latter two have bigger perithecia and different hosts (*Peltigera* and *Lecidea fuscoatra* (L.) ACH., respectively), the former has similar perithecia, but the spores are larger and distichously arranged in the asci, the host is *Caloplaca rubelliana* (ACH.) LOJKA.

**Additional specimens examined**, all on *Physcia atrostriata*: Loc. 4, hilly area with mixed trees, on *Mangifera*, leg. P. & B. VAN DEN BOOM 36425, 8. 7. 2006, on an unidentified tree, P. & B. VAN DEN BOOM 36429, 8. 7. 2006, on an unidentified shrub; Loc. 9 on sloping trunk of *Mimosaceae*, P. & B. VAN DEN BOOM 36542, 13. 7. 2006.

### ***Skyttea lecanorae* DIEDERICH & ETAYO**

Loc. 5, on a rocky mountain, with some shrubs on N exposed steep outcrop, on *Lecanora*.

Although the main characters fit the original description well, that is immersed striate apothecia (0.10-0.15 mm), olivaceous excipular hyphae, unseptate ascospores ca. 12 × 2.5 µm, the saxicolous habit is different from the corticolous specimens in DIEDERICH & ETAYO (2000). In this latter paper it is mentioned from the Canary Islands. In a recent publication about lichenicolous fungi of Guatemala (ETAYO & VAN DEN BOOM 2006) this species is also treated.

### ***Sphinctrina leucopoda* NYL.**

Loc. 5, on a rocky mountain, with some shrubs on acidic rock, on *Lecanora*.

It is known from the Canary Islands (HERNÁNDEZ PADRÓN 2009). Although EGEE (1996) mentioned some *Spinctrina* species from Morocco, *S. leucopoda* was not included.

### ***Stigmidium epixanthum* HAFELLNER**

Loc. 3, hilly area with low, S exposed outcrops on slope, steep N exposed outcrops and mixed trees, on acidic rocks, on *Acarospora* cf. *umbilicata* BAGL.

*Stigmidium epixanthum* is a common species on the Canary Islands and known from all seven islands (HERNÁNDEZ PADRÓN 2009).

### ***Stigmidium tabacinae* (ARNOLD) TRIEBEL**

Loc. 3, hilly area with low, S exposed outcrops on slope, steep N exposed outcrops



and mixed trees, on acidic rock, on *Toninia tristis* (TH. FR.) TH. FR.; Loc. 16, outcrops, boulders and walls along trail, on acidic rock, on *Toninia tristis*.

This is a common species in southwestern Europe and the Canary Islands (many specimens in herbarium VAN DEN BOOM).

***Syncesia myrticola* (FÉE) TEHLER**

Loc. 12, on volcanic rock NW slope with acidic outcrops, shrubs and ± scattered small trees, on volcanic rock.

*Syncesia myrticola* is widely distributed in western Europe (England and Ireland) and the Canary Islands (TEHLER 1996), so it is not surprising to encounter it in Cape Verde.

***Thelenella inductula* (NYL.) H. MAYRH.**

Loc. 3, hilly area with low S exposed outcrops on slope, steep N exposed outcrops and mixed trees, on N exposed vertical acidic outcrop; Loc.19, NE exposed slope with acidic outcrops along road, on S exposed vertical acidic outcrops.

*Thelenella inductula* is known from an old record in Portugal, from the Canary Islands and California (USA, MAYRHOFER 1987).

***Thelopsis africana* VAN DEN BOOM, spec. nova** (Fig. 2)

Mycobank MB 800833

*Thelopso paucisporo* BREUSS & M. SCHULTZ similis, sed differt in ascomatibus 100-350 µm diam., ascosporis ellipsoideis, 8-10 × 3-4.5(-5) µm, thallis specierum generis *Thelopsis* crescens, in margine thalli non subeffigurato.

**Typus:** Cape Verde, Sano Antão, SW of Ponta do Sol, Fontainhas, S side above village, N exposed slope with acidic outcrops along trail, 25° 06.2' W - 17° 11.2' N, 245 m s. m., on N exposed vertical acidic outcrops, 20. 7. 2006, P. & B. VAN DEN BOOM 36816 (holotype in BCN; isotype in herbarium VAN DEN BOOM).

**Description:** Thallus crustose, epilithic, pale greyish to pale brownish with an ochraceous tinge, rimose to areolate, areoles plane to slightly convex, up to 1 mm wide, up to 0.25 mm thick. Thallus margin distinctly delimited by a white ± fimbriate prothallus, neither effigurate nor subeffigurate. Photobiont *Trentepohlia*, cells globose. Ascomata perithecioid, pale brownish in appearance, globose, immersed in the thallus, 100-350 µm in diam., scattered; perithecial wall pseudoparaplectenchymatous, in section up to 20 µm wide, hyaline, but pale brown pigments intracellular at the upper part; hamathecial filaments abundant, simple, embedded in a gel, 1-2 µm wide, hymenium IKI + blue; asci cylindrical, thin walled, with a small ocular chamber, I -, 100-120 × 10-14 µm, up to 48-spored; ascospores 1-septate, hyaline, with a smooth surface, cylindrical to slightly clavate, 8-10 × 3-4.5(-5) µm, not or rarely slightly constricted at septum, perispore not observed; conidiomata not seen.

**Ecology and distribution:** The new species is only known from the type locality, growing abundantly, in a wide open valley, on north exposed vertical outcrops. The following accompanying lichens were observed: *Bactrospora thyrsodes* (STIRT.) LLOP & VAN DEN BOOM, *Dirinariaria applanata* (FÉE) AWASTHIL, *Lecanographa dialeuca* (CROMB.) EGEA & TORRENTE, *Paralecanographa grumulosa* (DUFOR) ERTZ & TEHLER, *Peltula obscurans* (NYL.) GYELN., *Pyxine cocoes* (SW.) NYL., *Rinodina oxydata* (A. MASSAL.) A. MASSAL. and *Roccella tinctoria* DC.

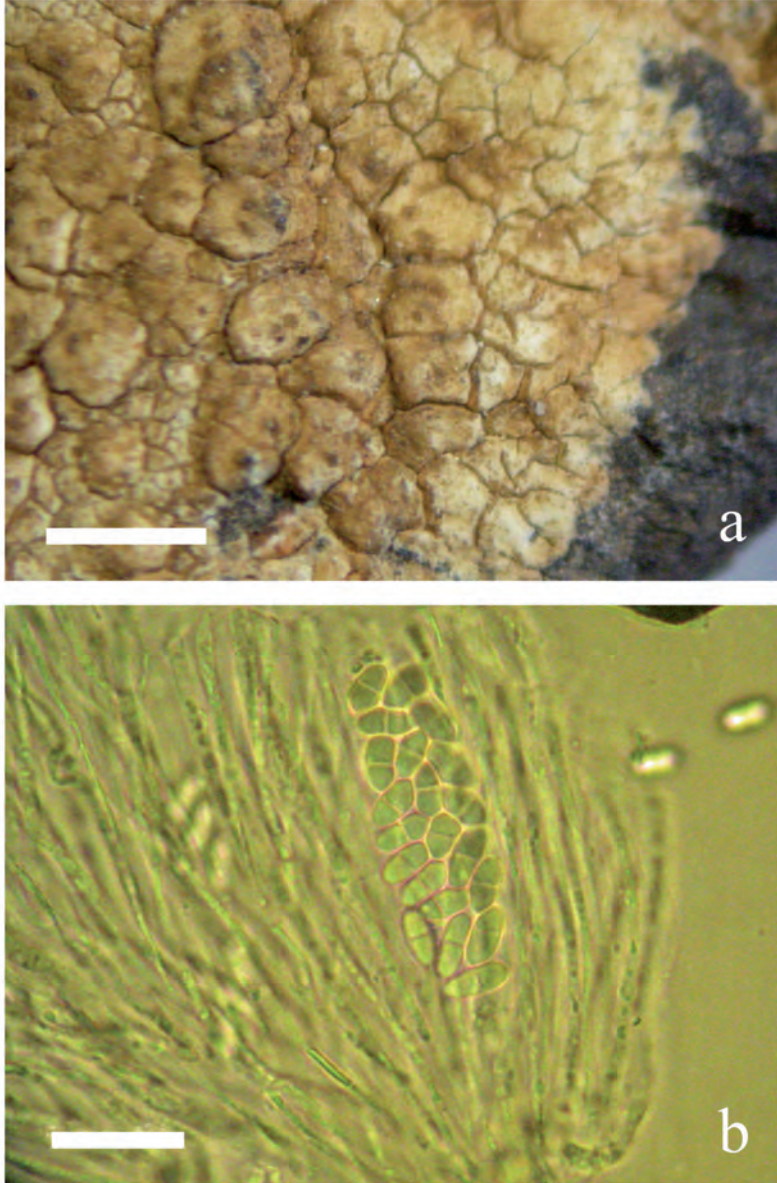


Fig. 2. *Thelopsis africana* (holotype). a Habitus, b hamathecium and ascospores. Bar: a 1 mm, b 20  $\mu$ m.

**Discussion:** In the worldwide key of *Thelopsis* by BREUSS & SCHULTZ (2007), ten species are treated. However, none of them corresponds with the Cape Verdean material. Most related seems to be *Thelopsis paucispora* BREUSS & M. SCHULTZ. It has also pale perithecia, immersed in the thallus, pale ochraceous thallus, but with inconspicuous ostioles. It has 30-40 spores per ascus, the spores are larger, 14-19 × 4-5 µm. Perithecia are much smaller, c. 0.2 mm and the thallus has a subeffigurate margin.

***Thelopsis flaveola* ARNOLD**

Loc. 21, scattered mixed trees, acidic outcrops and walls, on branches of *Mangifera*, in a rather shaded situation.

The genus *Thelopsis* was formerly represented on Cape Verde by *T. isiaca* STI-ZENB., a species from southern Europe and Macaronesia, also known from Morocco (EGEA 1996). However *T. flaveola* is a very small species and easily overlooked, formerly known from central and northern Europe (SANTESSON & al. 2004) and USA.

***Toninia aromatica* (TURNER ex SM.) A. MASSAL.**

Loc. 20, scattered mixed trees, acidic outcrops and walls, on acidic rocks; Loc. 18, N exposed slope with acidic outcrops along a trail, on acidic rock.

Although this species is very common in SW Europe and on the Canary Islands, it was not reported by MIES (1993). Many Moroccan reports can be found in EGEA (1996). It seems to be not rare on Cape Verde.

***Toninia squalida* (ACH.) A. MASSAL.**

Loc. 13, area with terrace cultivation, many walls, some outcrops and ± scattered trees, on N exposed vertical acidic rocks.

There are several reports of *T. squalida* from Morocco (EGEA 1996), but it is not recorded in MIES (1993).

***Tremella ramalinae* DIEDERICH**

Loc. 12, NW slope with acidic outcrops, shrubs and ± scattered small trees, on shrubs under overhanging outcrops.

Some information about this species can be found in VAN DEN BOOM & ETAYO (2006), where it was recorded for the Canary Islands for the first time.

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