

LICHENS COLLECTED DURING THE 12TH “ITER MEDITERRANEUM” IN TUNISIA (24 MARCH – 4 APRIL, 2014). PART II

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Abstract: We present a second short list of already identified lichens collected during OPTIMA ITER to Tunisia in 2014. The lichens were collected in 20 sampling sites in the northern part of the country. We report on ecological and distributional data related to 45 taxa, 11 of them were not included in the published checklist of lichens of Tunisia and further papers related to the diversity of lichens of Tunisia (*Calicium glaucellum*, *Catapyrenium daedaleum*, *C. psoromoides*, *Gyalecta jenensis*, *Haematomma ochroleucum*, *Lecania sylvestris*, *Lecanora argentata*, *Parmotrema stuppeum*, *Physcia phaea*, *Ramalina subgeniculata*, and *Rinodina pyrina*).

Key words: biodiversity, lichenized fungi, North Africa

INTRODUCTION

Studies on lichen diversity of Tunisia have been scarce for a long period (EL MOKNI *et al.* 2018). The 12th “Iter Mediterraneum” to Tunisia enabled the collection of not only vascular plants, but also bryophytes and lichens in the northern part of the country – along the Mediterranean coast (CAMPISI *et al.* 2015, DOMINA *et al.* 2015, GREUTER & DOMINA 2015, SMAOUI 2015). This area, together with the Betico-Reifean and Kabylies-Numidia complexes is known as a regional biodiversity hotspot (MÉDAIL & QUÉZEL 1997). The first short report on collected lichens was published by GUTTOVÁ *et al.* (2015). In this paper we present a list of species based on the identification of the second part of the collected material.

MATERIAL AND METHODS

In this contribution we present collections from 20 sampling sites in the northern part of Tunisia (Table 1). They include wide range of habitats (GUTTOVÁ *et al.* 2015). The material is kept in SAV (as SAV – C OPTIMA ITER 2014), of which duplicates are being prepared for herbarium PAL. Standard light microscopic and chemical methods were used for the identification of the material. Nomenclature of lichens follows NIMIS *et al.* (2016). Nomenclature of vascular plants follows African Plant Database 2019 (APD 2019).

Table 1. List of collecting sites.

No	area	locality	latitude	longitude	altitude	date
1	Cap Bon	Bou Kornine Mt.	36° 42.352'	10° 20.672'	119 m	24.3.2014
2	Cap Bon	Bou Kornine Mt.	36° 42.223'	10° 20.591'	176 m	24.3.2014
3	Cap Bon	Bou Kornine Mt., Hammam Lif	36° 42.189'	10° 20.510'	227 m	24.3.2014
4	Cap Bon	Bou Kornine Mt.	36° 43.525'	10° 19.545'	70 m	24.3.2014
5	Cap Bon	El Haouraia, Les Grottes	37° 03.451'	10° 59.694'	18 m	26.3.2014
6	Cap Bon	coastline between Kélibia and Sidi Jamel Eddine	36° 48.100'	11° 01.722'	12 m	26.3.2014
7	Cap Bon	Zaghouan Mt.	36° 21.883'	10° 05.281'	593 m	27.3.2014
8	Mogods	Djebel Ichkeul	37° 08.277'	9° 41.511'	55 m	29.3.2014
9	Mogods	Djebel Ichkeul, Mateur	37° 08.230'	9° 41.454'	82 m	29.3.2014
10	Mogods	Djebel Ichkeul, Mateur	37° 07.929'	9° 41.336'	7 m	29.3.2014
11	Mogods	along the road between Teskraya and Sejnane, near Fejjet Errih	37° 13.547'	9° 29.690'	235 m	30.3.2014
12	Mogods	Cap Serrat, Sidi Ferdjani	37° 13.213'	9° 13.374'	15 m	30.3.2014
13	Mogods	Bizerte	37° 14.941'	9° 54.946'	18 m	31.3.2014
14	Mogods	Bizerte, Corniche – Les Grottes	37° 19.956'	9° 50.593'	27 m	29.3.2014
15	Kroumiria	Tabarka	36° 56.757'	8° 42.445'	194 m	2.4.2014
16	Kroumiria	Aïn Draham	36° 47.390'	8° 41.001'	775 m	2.4.2014
17	Kroumiria	Massif de Feidja, Ghardimaou	36° 29.313'	8° 18.333'	771 m	3.4.2014
18	Kroumiria	Aïn Draham	36° 45.255'	8° 41.266'	661 m	4.4.2014
19	Kroumiria	Natura park el Feidja, Ghardimaou, oak woods	36° 31.432'	8° 19.681'	876 m	3.4.2014
20	Kroumiria	Aïn Draham	36° 44.363'	8° 40.988'	688 m	3.4.2014

RESULTS

Our list includes 45 taxa, out of which eleven, marked with an asterisk (*) were not mentioned in SEAWARD (1996), GUTTOVÁ *et al.* (2015), EL MOKNI *et al.* (2015, 2018), and TABBABI & KARMOUS (2016).

Alyxoria varia – 6 – along the road C27, field lined with *Cupressus* sp., *Pinus halepensis*, on bark of *Pinus halepensis*.

Anaptychia runcinata – 16 – *Quercus canariensis* forest near the hotel Nour El Ain – Dar Ismaïl, on crystalline sandstone rock.

Arthonia calcarea – 5 – sandstone sea shore with caves, on rock.

Athallia holocarpa – 1 – E facing wooded slopes (*Tetraclinis articulata*, *Erica* cf. *arborea*, *Cupressus*, *Juniperus*), on branches of *Tetraclinis articulata*.

**Calicium glaucellum* – 17 – wood with *Quercus suber* and *Sphagnum* bog along P17 road, on bark of *Q. suber*.

Caloplaca cerina – 1 – E facing wooded slopes (*Tetraclinis articulata*, *Erica* cf. *arborea*, *Cupressus*, *Juniperus*), on branches of *Tetraclinis articulata*.

**Catapyrenium daedaleum* – 1 – E facing wooded slopes (*Tetraclinis articulata*, *Erica* cf. *arborea*, *Cupressus*, *Juniperus*), on soil.

**Catapyrenium psoromoides* – 3 – NE slopes, siliceous boulders and schistose rocks in open place between scrub vegetation, on hard soil.

Chrysothrix candelaris – 17 – wood with *Quercus suber* and *Sphagnum* bog along P17 road, on bark of *Q. suber*.

Cladonia foliacea f. *convoluta* – 1 – E facing wooded slopes (*Tetraclinis articulata*, *Erica* cf. *arborea*, *Cupressus*, *Juniperus*), on soil.

Cladonia pocillum – 15 – managed plantation of *Pinus pinaster* along the road P7, on soil.

Cladonia pyxidata – 2 – E facing wooded slopes (*Tetraclinis articulata*, *Erica* cf. *arborea*, *Cupressus*, *Juniperus*), on calcareous soil.

Collema nigrescens – 20 – *Quercus canariensis* forest along the road P17 near the town, dump site, on mossy bark of *Quercus canariensis*.

Diploschistes diacapsis – 1 – E facing wooded slopes (*Tetraclinis articulata*, *Erica* cf. *arborea*, *Cupressus*, *Juniperus*), on soil.

Enchylium tenax – 12 – sea coast with schistose outcrops and *Quercus suber*, E facing slopes, on soil.

**Gyalecta jenensis* – 11 – along the road between Teskraya and Sejnane, near Fejjet Errih, a hill with burnt-down oak forest, siliceous sandstone outcrops on the summit, on rock; – 16 – *Quercus canariensis* forest near the hotel Nour El Ain – Dar Ismaïl, on crystalline sandstone rock.

Gyalolechia fulgida – 1 – E facing wooded slopes (*Tetraclinis articulata*, *Erica* cf. *arborea*, *Cupressus*, *Juniperus*), on soil; – 3 – NE slopes, siliceous boulders and schistose rocks in open place between scrub vegetation, on hard soil; – 7 – NW slopes of the massif facing Bir Halima, seminatural outcrops of limestone rock along the dirty road bank, on soil.

Gyalolechia subbracteata – 1 – E facing wooded slopes (*Tetraclinis articulata*, *Erica* cf. *arborea*, *Cupressus*, *Juniperus*), on soil.

**Haematomma ochroleucum* – 16 – *Quercus canariensis* forest near the hotel Nour El Aïn – Dar Ismaïl, on crystalline sandstone rock.

**Lecania sylvestris* – 3 – NE slopes, siliceous boulders and schistose rocks in open place between scrub vegetation, on schist.

Lecania turicensis – 1 – E facing wooded slopes (*Tetraclinis articulata*, *Erica* cf. *arborea*, *Cupressus*, *Juniperus*), on sandstone/schistose rocks.

**Lecanora argentata* – 1 – E facing wooded slopes (*Tetraclinis articulata*, *Erica* cf. *arborea*, *Cupressus*, *Juniperus*), on branches of *Tetraclinis articulata*; – 13 – pine forest (*Pinus halepensis*, *P. pinea*) on sand dunes along the coast nearby the town, on bark of *Pinus halepensis*.

Melanelixia glabrata – 17 – rock towers and outcrops Kef Negcha, on mosses on bark of *Quercus* sp.

Nephroma tangeriense – 16 – *Quercus canariensis* forest near the hotel Nour El Aïn – Dar Ismaïl, on crystalline sandstone rock; – 17 – rock towers and outcrops Kef Negcha, on mosses on crystalline rock.

Ocellomma picconianum – 6 – along the road C27, field lined with *Cupressus* sp., *Pinus halepensis*, on bark of *Pinus halepensis*; – 13 – pine forest (*Pinus halepensis*, *P. pinea*) on sand dunes along the coast nearby the town, on bark of *Pinus halepensis*.

Parmelia saxatilis – 16 – *Quercus canariensis* forest near the hotel Nour El Aïn – Dar Ismaïl, on crystalline sandstone rock.

**Parmotrema stuppeum* – 16 – *Quercus canariensis* forest near the hotel Nour El Aïn – Dar Ismaïl, on crystalline sandstone rock.

Pectenium plumbeum – 19 – oak woods, on mossy bark of *Quercus* sp.

Peltigera neckeri – 12 – sea coast with schistose outcrops and *Quercus suber*, E facing slopes, on soil.

Peltigera polydactylon – 16 – *Quercus canariensis* forest near the hotel Nour El Aïn – Dar Ismaïl, on mossy crystalline sandstone rock.

Phaeophyscia hirsuta – 9 – shaded calcareous outcrops with scrub vegetation, on bark of *Quercus* sp.

Physcia adscendens – 9 – shaded calcareous outcrops with scrub vegetation, on bark of *Quercus* sp.

Physcia biziana – 9 – shaded calcareous outcrops with scrub vegetation, on bark of *Quercus* sp.; – 10 – foot of the massive above the lake Ichkeul, on bark of *Olea*; – 20 – *Quercus canariensis* forest along the road P17 near the town, dump site, on mossy bark of *Quercus canariensis*.

**Physcia phaea* – 11 – along the road between Teskraya and Sejnane, near Fejjet Errih, a hill with burnt-down oak forest, siliceous sandstone outcrops on the summit, on rock.

Psora decipiens – 1 – E facing wooded slopes (*Tetraclinis articulata*, *Erica* cf. *arborea*, *Cupressus*, *Juniperus*), on soil; – 4 – SW facing slopes with rock outcrops and wood (*Tetraclinis articulata*, *Erica* cf. *arborea*, *Cupressus*, *Juniperus*), on calcareous soil.

**Ramalina subgeniculata* – 19 – oak woods, on mossy bark of *Quercus* sp.

**Rinodina pyrina* – 1 – E facing wooded slopes (*Tetraclinis articulata*, *Erica* cf. *arborea*, *Cupressus*, *Juniperus*), on branches of *Tetraclinis articulata*.

Roccella phycopsis – 8 – massif above the lake Ichkeul, semi-shaded calcareous outcrops, on limestone rocks.

Squamarina concrescens – 3 – NE slopes, siliceous boulders and schistose rocks in open place between scrub vegetation, on hard soil.

Tephromela atra – 16 – *Quercus canariensis* forest near the hotel Nour El Aïn – Dar Ismaïl, on crystalline sandstone rock.

Thelopsis isiaca – 13 – pine forest (*Pinus halepensis*, *P. pinea*) on sand dunes along the coast nearby the town, on bark of *Pinus halepensis*; – 14 – rocky sea coast with *Juniperus oxycedrus* subsp. *macrocarpa*, *Pinus halepensis*, *Thymelaea* sp., on *Juniperus* twigs.

Toninia sedifolia – 1 – E facing wooded slopes (*Tetraclinis articulata*, *Erica* cf. *arborea*, *Cupressus*, *Juniperus*), on soil; – 2 – E facing wooded slopes (*Tetraclinis articulata*, *Erica* cf. *arborea*, *Cupressus*, *Juniperus*), on soil; – 3 – NE slopes, siliceous boulders and schistose rocks in open place between scrub vegetation, on schist.

Umbilicaria crustulosa – 17 – rock towers and outcrops "Kef Negcha", on mosses on crystalline rock.

Xanthoparmelia stenophylla – 17 – rock towers and outcrops "Kef Negcha", on mosses on crystalline rock.

Xanthoria parietina – 6 – along the road C27, field lined with *Cupressus* sp., *Pinus halepensis*, on bark of *Pinus halepensis*.

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REFERENCES

- APD (African Plant Database) (version 3.4.0). (2019): Pretoria: *Conservatoire et Jardin botaniques de la Ville de Genève and South African National Biodiversity Institute*. Accessed 12 November 2019. <http://www.ville-ge.ch/musinfo/bd/cjb/africa/>
- CAMPISI P., DIA M. G., DOMINA G. & RAIMONDO F. M. (2015): Bryophytes collected during the 12th “Iter Mediterraneum” (Tunisia, 24 March – 4 April 2014). First contribution. – *Bocconea* 27: 63–68.
- DOMINA G., GREUTER W., ELYES KCHOUK M., EL MOKNI R., SMAOUI A., VITEK E., BAZAN G., ESCOBAR P. & RAIMONDO F. M. (2015): The 12th “Iter Mediterraneum” in Tunisia, 24 March – 4 April 2014. – *Bocconea* 27: 5–11.
- EL MOKNI R., BOUTABIA ÉP. TLAILIA L. & EL AOUNI M. H. (2018): *Occurrence and bioindication of lichens within oak forests of Tunisia*. – In: KALLEL A. et al. (eds): Recent advances in environmental science from the Euro-Mediterranean and surrounding regions. Advances in Science, Technology & Innovation. Springer International Publishing AG, pp. 1463–1465.
- EL MOKNI R., BOUTABIA ÉP. TLAILIA L., SEBEI H. & EL AOUNI M. H. (2015): Species richness, distribution, bioindication and ecology of lichens in oak forests of Kroumiria, North West of Tunisia. – *J. Bio. Env. Sci.* 7: 32–60.
- GREUTER W. & DOMINA G. (2015): Checklist of the vascular plants collected during the 12th “Iter Mediterraneum” in Tunisia, 24 March – 4 April 2014. – *Bocconea* 27: 21–61.
- GUTTOVÁ A., VONDRÁK J., SCHULTZ M. & EL MOKNI R. (2015): Lichens collected during the 12 “Iter Mediterraneum” in Tunisia, 24 March – 4 April, 2014. – *Bocconea* 27: 69–76.
- MÉDAIL F. & QUÉZEL P. (1997): Hot-spots analysis for conservation of plant biodiversity in the Mediterranean basin. – *Ann. Missouri Bot. Garden* 84: 112–127.
- NIMIS P. L. (2016): *The lichens of Italy. A second annotated catalogue*. – Università di Trieste, Trieste, Italy, 739 pp.
- SEAWARD M. R. D. (1996): Checklist of Tunisian lichens. – *Bocconea* 6: 115–148.
- SMAOUI A. (2015): Bioclimat et Végétation de la Tunisie et des régions prospectées pendant le 12ème ITER Mediterraneum de OPTIMA. – *Bocconea* 27: 13–20.
- TABBABI K. & KARMOUS T. (2016): Characterization and identification of the components extracted from 28 lichens in Tunisia by high performance thin-layer chromatography (HPTLC), morphologic determination of the species and study of the antibiotic effects of usnic acid. – *Med. Aromat. Plants* 5: 253.

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