

New Pottiaceae Records to the Moss Flora of Libya

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POTTIACEAE includes up to 5,311 species worldwide. It is the largest moss family in Libya with 41 out of a total of 98 species known from this country. Most of the species are quite old records based on collections published before 1932. In this recent work 20 Pottiaceae mosses are reported from Libya including two new records namely; *Microbryum rectum* (With.) R.H.Zander and *Weissia controversa* var. *crispata* (Nees and Hornsch.) Nyholm. Descriptions and illustrations of the two new records together with geographic distribution and brief comments on all taxa are given.

Keywords: Pottiaceae, Mosses, Al-Jabal Al- Akhdar, Beida, Zawya Al-Qadima, Libya.

Introduction

The Plant List includes 5,311 scientific plant names of species rank for the family Pottiaceae (The plant list, 2013). Of these 3,223 are accepted species names belong to 138 plant genera distributed in different parts of the world. Up till now 16 genera and 41 species of Pottiaceae are known from Libya and all are quite old records based on collections published before 1932 except *Aloina ambigua* (Bruch and Schimp.) Limpr. which is not that old, being recorded by Rungby in 1962, Bizot, in 1973 and Gallego et al. in 1999, besides *Didymodon rigidulus* Hedw. and *D. tophaceus* (Brid.) Lisa which were recorded also by Bizot in 1973. Baroni (1892) was the first to mention Pottiaceae from Libya followed by Durand & Barratte (1910), Zodda (1913, 1914), Bottini (1914) and Pampanini (1917, 1931), etc. (Ros et al., 2013).

Pottiaceae exist mainly in the north of Libya at Tobruk, Chersa, Al Qubbah, Mechili, Shahet, Borgo, Tocrá, Tecniz, Tolmetta, Darnah, Susa, Beida (or Bayda), Wadi Kouf, Al Marj, Benghazi, Tripoli and Gharyain on the Mediterranean coast (Fig. 1). There are three other Pottiaceae collection sites mentioned in the literature, i.e. Bosco Zorda, Wadi Balgader and Wadi Sambar but we could not find them on the available geographical maps of Libya.

To prepare a more up to date moss flora of Libya, the first author of this paper made a large number (550) of moss collections, between the years 2004-2008, from five areas in Al-Jabal Al-Akhdar (the green mountain) namely: Wadi Kouf (200 specimens), Beida (189 specimens), Shahet (99 specimens), Mas'sa (37 specimens) and Hani'ya (25 specimens).

One-hundred and thirty out of the 200 specimens of Wadi Kouf had been studied in a series of 4 papers (Shabbara & Ghanem, 2006 and Youssef et al., 2009 a,b and 2017) which resulted in the record of 14 species. Ten of these 14 species (7 Brachytheciaceae, 2 Orthotrichaceae and 1 Fabroniaceae) were then new records to Libya while the other four (3 Brachytheciaceae and 1 Orthotrichaceae) were recorded earlier by Bottini (1914), Zodda (1926) and Pampanini (1931).

The present paper is the fifth in this series pertaining to the mosses of Al-Jabal Al-Akhdar and deals with 28 out of the 189 specimens that were collected from Beida. The 161 specimens remaining from Beida and the specimens of the three other areas (Shahet, Mas'sa and Hani'ya) will be considered in forth coming publications.

Study Area and Materials

The Al-Jabal Al-Akhdar is a limestone plateau up to 870 m above sea level with an undulating surface which tips gently to the south, stretches

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between the longitudes $20^{\circ} 35' E$ to $23^{\circ} 15' E$ and latitudes $30^{\circ} 58' N$ to $32^{\circ} 56' N$ in the North-East of Libya between Benghazi and Darnah (Fig. 2) (Suleiman et al., 2016). This Jabal (mountain)

is covered by arching Plateau built of upper Cretaceous and Tertiary sediments of limestone, subordinate dolomites and marls. These sediments were deposited at the southern margin of the Tethys sea.



Fig.1. Map showing the sites (old and new) of collections of family Pottiaceae in Libya. 1- Tobruk, 2- Darnah, 3- Chersa, 4- Al Qubba, 5- Mechili, 6- Susa, 7- Shahet, 8- Beida, 9- Wadi Kouf, 10- Tocra, 11- Al Marj, 12- Tecniz, 13- Tolmetta, 14- Benghazi, 15- Tripoli, 16- Borgo and 17- Gharyain.

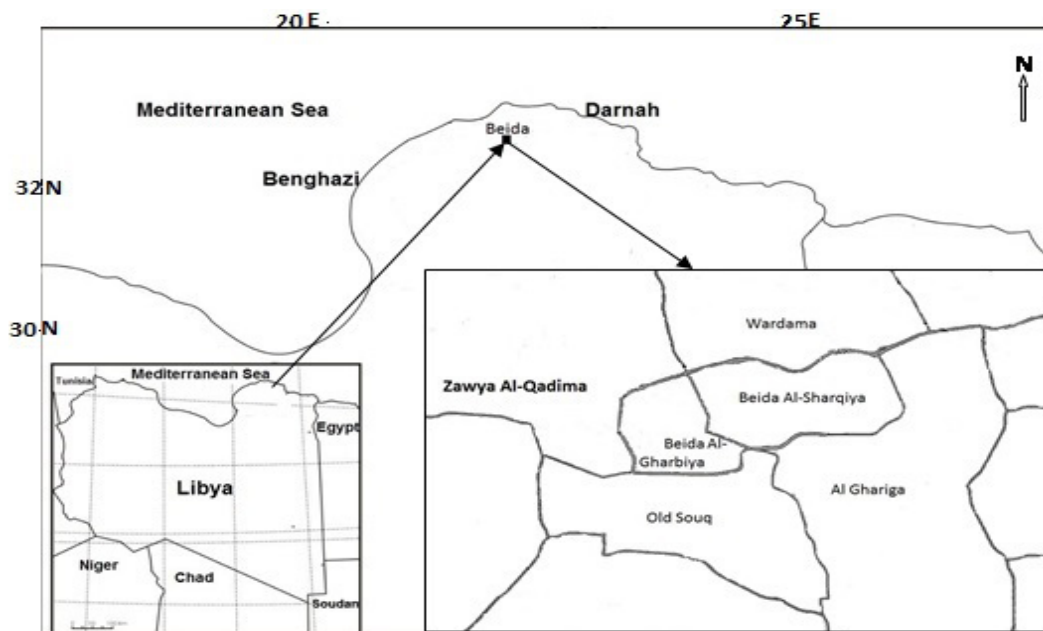


Fig. 2. Map showing the site of the study area (Zawya Al-Qadima) and the other provinces of Beida.

Beida is located in the plateau of Al-Jabal al-Akhdar in the north-east of Libya at an altitude reaching about 625 meters above sea level and between the latitudes 32° 45' 59"N to 32° 56' 39"N and longitudes 21° 44' 30"E to 21° 54' 57"E between Benghazi and Darnah. Beida is considered one of the best towns in Libya in terms of nature and climate, where the climate is mild and cold to cool in the winter, and the average annual rainfall ranges between 550-700 mm, 20-30% falling in January. The temperature is 4-13°C in winter and 13-27°C in summer, while winds are northern in winter but southern and east southern in other seasons. These climate conditions are suitable for a good bryophytes plant cover (Röhlich, 1978).

One-hundred and eighty-nine moss specimens were collected on the 29th and 30th of December, 2004 from different areas of Beida namely: Wardama (42 specimens), Beida Al-Sharqiya (40 specimens), Beida Al-Gharbiya (35 specimens), Zawya Al-Qadima (28 specimens), the Old Souq (25 specimens) and Al Ghariga (19 specimens) (Fig. 2).

The present work deals with the 28 specimens which were collected from Zawya Al-Qadima (one of the six provinces to which Beida is divided; Fig. 2). Zawya Al-Qadima lies to the west of Beida, at latitudes ca 32° 46' 05"N and longitudes ca 21° 42' 43"E, ca 550-600 meters above sea level. Zawya Al-Qadima area consists of clay, rocks and stones with high and low water levels and is rich in arborescent seed plants as: *Juniperus phoenicea* L., *Quercus coccifera* L., *Pistacia lentiscus* L. and *Phillyrea latifolia* L. The collected mosses were found growing, on shaded coarse soil under trees and between rocks where water flows. Samples were kept in herbarium packets at CAIA (Herbarium, Botany Department, Faculty of Science, Ain Shams University).

Results and Discussion

After careful study of the 28 specimens of Zawya Al-Qadima, it was found that they include mosses representing six families namely: Brachytheciaceae, Dicranaceae, Fissidentaceae, Funariaceae, Grimmiaceae and Pottiaceae. Only Pottiaceae will be dealt with here while the other remaining families will be considered later. Pottiaceae in the 28 specimens is represented by 20 species. Eighteen of them represent old records to Libya while only two namely: *Microbryum rectum*

(With.) R.H.Zander and *Weissia controversa* var. *crispata* (Nees and Hornsch.) Nyholm. are new records to it. This raised the number of Pottiaceae known from Libya to 43 species and its known moss flora to 100 species. These 43 Pottiaceae species are also highly distributed in different countries of the Mediterranean region (the most common are *Tortula muralis* Hedw. and *Trichostomum crispulum* Bruch being recorded in all Mediterranean countries, while the least common is *Alonia biforns* (De Not.) Delgad.; in 11 countries (Ros et al., 2013).

Geographic distribution, descriptions and comments

Details about the 20 recorded species are given below including; number of gatherings and distribution, while descriptions and illustrations are given for only the two new records. The number following each plant name is the specimen number which is followed by the acronym "YLZ" where Y= Youssef- one of the authors of this paper, L= Libya and Z= Zawya Al-Qadima.

Aloina rigida (Hedw.) Limpr

One gathering (360 YLZ), on clay wet soil in shade under trees.

Distribution

In Libya; Al Marj, Benghazi, Gharyain and Tripoli (Bottini, 1914 and Pampanini, 1917, 1931); Zawya Al-Qadima-Beida (the present work).

In the Mediterranean region: In 30 out of 34 countries (Ros et al., 2013).

In the world: Mediterranean region, Australia, Chad, Djibouti, Iraq, Kenya and United States (Haring, 1961; Weber, 1973; Agnew & Vondráček, 1975; Peck, 1978; McCleary & Redfearn, 1979; Catcheside, 1980; Mahler, 1980; Zander, 1993; O'Shea, 2006 and Ros et al., 2013).

Crossidium crassinervium (De Not.) Jur

One gathering (361a YLZ), on clay wet limestone soil, in shade under trees.

Distribution

In Libya; no sites were mentioned; only Libya (Ros et al., 1999); Zawya Al-Qadima-Beida (the present work).

In the Mediterranean region: In 24 out of 34 countries (Ros et al., 1999).

In the world: Mediterranean region, Chad,

China, Mexico and United States (Tan & Zhao, 1997; Mahler, 1980; O'Shea, 2006; Delgadillo & Cárdenas, 2011 and Ros et al., 1999).

C. squamiferum (Viv.) Jur

One gathering (361b YLZ), on clay wet soil, in shade under trees.

Distribution

In Libya; Al Marj, Mechili, Tecniz, Bosco Zorda, Tripoli and Gharyain (Bottini, 1914 and Pampanini, 1931); Zawya Al-Qadima-Beida (the present work).

In the Mediterranean region: In 23 out of 34 countries (Ros et al., 1999).

In the world: Mediterranean region, Chad, China, Iraq, and Mongolia (Agnew & Vondráček 1975; El-Saadawi & Badawi, 1977; Abramov & Abramova, 1983; Redfearn & Wu, 1986; O'Shea, 2006 and Ros et al., 2013).

C. squamiferum (Viv.) Jur. var. *pottioideum* (De Not.) Mönk

One gathering (361c YLZ), on wet limestone soil, in shade under trees.

Distribution

In Libya; no sites were mentioned; only Libya (Ros et al., 2013); Zawya Al-Qadima-Beida (the present work).

In the Mediterranean region: In 15 out of 34 countries (Ros et al., 1999).

In the world: Mediterranean region, Iraq, Mongolia and United States (Agnew & Vondráček 1975; Abramov & Abramova, 1983; Zander, 2007 and Ros et al., 1999).

Didymodon acutus (Brid.) K.Saito

Three gatherings (362 YLZ-364 YLZ), on wet limestone soil, in shade under trees.

Distribution

In Libya; Al Qubbah (Pampanini, 1931), Zawya Al-Qadima-Beida (the present work).

In the Mediterranean region: In 33 out of 34 countries (Ros et al., 1999).

In the world: Mediterranean region, northern Africa, ES Europe, Turkey and United State (Anderson et al., 1990; O'Shea, 2006; Sabovljević, et al., 2008 and Ros et al., 1999).

D. fallax (Hedw.) R.H.Zander

One gathering (365 YLZ), on wet clay soil, in shade under trees.

Distribution

In Libya; Gharyain and Wadi Sambar (Bottini, 1914 and Pampanini, 1931); Zawya Al-Qadima-Beida (the present work).

In the Mediterranean region: In 32 out of 34 countries (Ros et al., 2013).

In the world: Mediterranean region, Canada, China, Mexico and United States (Redfearn & Wu, 1986; Zander, 1994, 2007 and Ros et al., 2013).

D. insulanus (De Not.) M.O.Hill

One gathering (366a YLZ), on wet limestone soil, in shade under trees.

Distribution

In Libya; Gharyain (Bottini, 1914); Zawya Al-Qadima-Beida (the present work).

In the Mediterranean region: In 30 out of 34 countries (Ros et al., 2013).

In the world: Mediterranean region, Kenya, Mali and Tanzania (O'Shea, 2006 and Ros et al., 1999).

D. luridus Hornsch

One gathering (367a YLZ), on wet clay soil, in shade under trees.

Distribution

In Libya; Al Marj, Darnah, Shahet, Tecniz, Tolmetta, Bosco Zorda, Gharyain and Wadi Kouf, (Bottini, 1914 and Pampanini, 1931); Zawya Al-Qadima-Beida (the present work).

In the Mediterranean region: In 33 out of 34 countries (Ros et al., 2013).

In the world: Mediterranean region, Chad and United States (Stark & Castetter, 1982 and O'Shea, 2006 and Ros et al., 2013).

D. vinealis (Brid.) R.H.Zander

Three gatherings (368 YLZ - 370 YLZ), on wet limestone soil, in shade under trees.

Distribution

In Libya; Beida, Benghazi, Shahet, Gharyain and Wadi Sambar (Bottini, 1914 and Pampanini, 1917, 1931); Zawya Al-Qadima-Beida (the present work).

In the Mediterranean region: In 33 out of 34 countries (Ros et al., 1999).

In the world: Mediterranean region, Chain, Java, Malaysia, Philippines, Mexico and United States (Stark & Castetter, 1982; Redfearn & Wu 1986; Eddy, 1990; Zander, 1994 and Ros et al., 1999).

Eucladium verticillatum (With.) Bruch and Schimp.

One gathering (371 YLZ), on wet limestone soil, in shade under trees.

Distribution

In Libya; Darnah, Wadi Kouf, Susa and Wadi Balgader (Pampanini, 1931); Zawya Al-Qadima-Beida (the present work).

In the Mediterranean region: In 32 out of 34 countries (Ros et al., 1999)

In the world: Mediterranean region, Brazil, Canada, Chad, China, Ethiopia, Japan, Mali, Mauritania, Rwanda, Mexico and United States (Weber 1973; Saito, 1975; McCleary & Redfearn, 1979; Redfearn, 1979; Churchill, 1985; Redfearn & Wu, 1986; Snider, et al., 1986; Noguchi & Iwatsuki, 1988; Zander, 1994, 2007; Xing-jiang & Iwatsuki, 1996; O'Shea, 2006; Forzza, 2010 and Ros et al., 1999).

Microbryum davallianum (Sm.) R.H.Zander

One gathering (366b YLZ), on wet limestone soil, in shade under trees.

Distribution

In Libya; Darnah (Pampanini, 1931); Zawya Al-Qadima-Beida (the present work).

In the Mediterranean region: In 30 out of 34 countries (Ros et al., 1999).

In the world: Mediterranean region, Brazil and South Africa (O'Shea, 2006, Forzza, 2010 and Ros et al., 1999).

M. rectum (With.) R.H.Zander

One gathering (372 YLZ), on wet clay soil, in shade under trees.

Distribution

In Libya: new record to Libya; Zawya Al-Qadima-Beida (the present work).

In the Mediterranean region: In 17 out of 34 countries (Ros et al., 1999).

In the world: Mediterranean region, Europe and Turkey (Hill et al., 2006; Sabovljević et al., 2008; Kirmaci & Agcagil, 2009, Ros et al., 1999 and Hodgetts, 2015).

Description

Plants brownish, very small (Fig. 3a), up to 1.5 mm high. Stems up to 0.5 mm high, rounded in cross section, and with central strand, sclerodermis and hyalodermis not differentiated (Fig. 3j). Leaves crisped when dry, appressed to weakly spreading when moist, lanceolate, ovate to oblong-lanceolate, 0.55-0.25 mm long, 0.27-0.13 mm wide, plane to broadly concave above mid (Fig. 3b,c); apex acute to acuminate; margins recurved, entire to slightly crenulate-papillose above (Fig. 3d,e); costa excurrent, circular in cross section, with only one stereid band and 2 guides, epidermis differentiated ventrally and dorsally (Fig. 3i); upper laminal cells hexagonal, short rectangular to rhomboidal, 8-12 µm long, 6-12 µm wide, strongly papillose, evenly thick walled (Fig. 3f,g); basal laminal cells lax, long to short rectangular, 18-30 (60) µm long, 12-18 µm wide, smooth, with thin walls (Fig. 3h). Seta short, 0.7 mm long; capsule globose to spherical, erect, orange-brown; lid small, conical, persistent (Fig. 3k); peristome absent. Spore 24 µm in diameter, yellowish brown, spinulose (Fig. 3l).

Microbryum rectum may be confused with *M. davallianum* (Sm.) R.H.Zander and *M. starckeanum* (Hedw.) R.H.Zander which are also known from Libya. But the cleistocarpous capsule of *M. rectum* distinguishes it easily from these two taxa which have stegocarpous capsules.

M. starckeanum (Hedw.) R.H.Zander

One gathering (367b YLZ), on wet limestone soil, in shade under trees.

Distribution

In Libya: Darnah, Al Qubba and Benghazi (Pampanini, 1931) Zawya Al-Qadima-Beida (the present work).

In the Mediterranean region: In 29 out of 34 countries (Ros, et al., 1999).

In the world: Mediterranean region and United States (Zander, 2007 and Ros et al., 1999).

Pseudocrossidium hornschurchianum (Schultz) R.H.Zander

One gathering (373a YLZ), on wet limestone soil, in shade under trees.

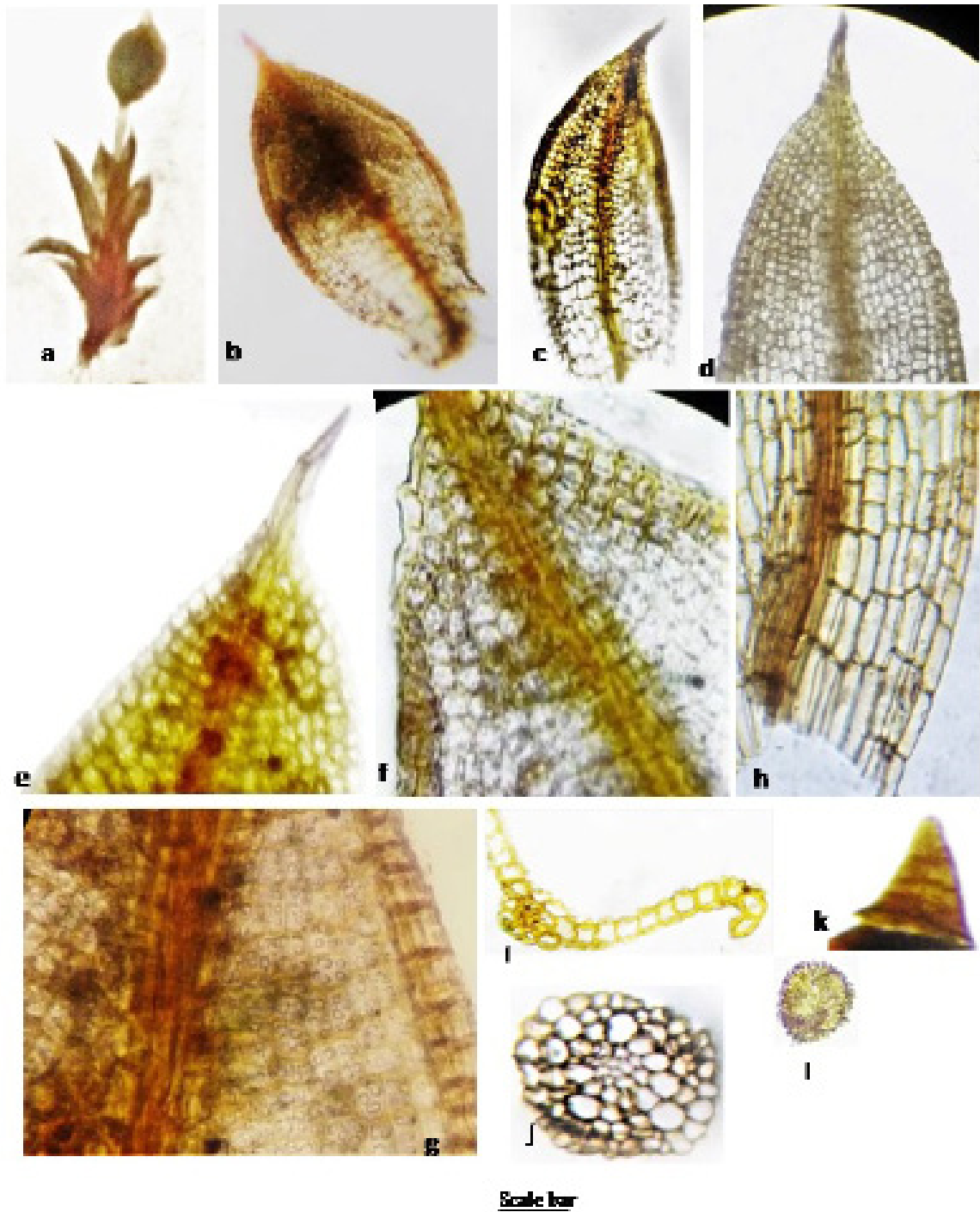


Fig. 3. a-l, *Microbryum rectum*: a- Gametophyte carrying sporophyte. b, c- Leaves. d, e - Leaf apices. f- Marginal cells below leaf apex. g- Upper laminal cells. h- Cells at leaf base. i- Part of a cross section of a leaf. j- Cross section of a stem. k- Lid. l- Spore.

Scale bar = 0.6 mm (a), 0.07 mm (b), 0.08 mm (c), 54 μ m (d), 36 μ m (e), 22.5 μ m (f), 22.5 μ m (g), 33.3 μ m (h), 29 μ m (i), 72 μ m (j), 36 μ m (k), 4.7 μ m (l).

Distribution

In Libya: Gharyain, Bosco Zorda and Wadi Darnah (Botanini, 1914 and Pampanini, 1931); Zawya Al-Qadima-Beida (the present work).

In the Mediterranean region: In 31 out of 34 countries (Ros et al., 1999)

In the world: Mediterranean region Canada, Ethiopia and South Africa (O'Shea, 2006 ; Zander, 2007 and Ros et al., 1999).

Timmiella barbulooides (Brid.) Mönk.

Four gatherings (373b YLZ, 374 YLZ-376 YLZ), on wet limestone soil, in shade under trees.

Distribution

In Libya: Al Marj, Tobruk, Tocrá and Wadi Sambar (Pampanini, 1931); Zawya Al-Qadima-Beida (the present work).

In the Mediterranean region: In 26 out of 34 countries (Ros et al., 1999)

In the world: Mediterranean region, Brazil, Chad, Djibouti, Egypt, Eritrea and Sudan (El-Saadawi & Badawi, 1977; O'shea, 2006; Forzza, 2010 and Ros et al., 1999).

Tortella tortuosa (Hedw.) Limpr.

Two gatherings (366c YLZ, 377 YLZ), on wet clay soil, in shade under trees.

Distribution

In Libya: No sites were mentioned; only Libya (Ros et al., 1999); Zawya Al-Qadima-Beida (the present work).

In the Mediterranean region: In 27 out of 34 countries (Ros et al., 1999).

In the world: Mediterranean region: Canary Islands, China, Hawaiian Isl, Iraq, Japan, Malawi, Mexico, Mongolia, and United States (Hilferty, 1960; Lampton, 1970; Lawton, 1971; Breil, 1973; Weber, 1973; Agnew & Vondráček, 1975; Saito, 1975; Peck, 1978; Eversman & Sharp, 1980; Ketchledge, 1980; Mahler, 1980; Stark & Castetter, 1982; Abramov & Abramova, 1983; Crum, 1983; Zander, 1994; Xing-jiang & Iwatsuki, 1996; Staples et al., 2004; O'Shea, 2006; Delgadillo & Cárdenas, 2011 and Ros et al., 1999).

Tortula marginata (Bruch and Schimp.) Spruce

One gathering (378a YLZ), on wet limestone soil, in shade under trees.

Distribution

In Libya: Beida, Tobruk, Susa, Darnah and Wadi Balgader (Bottini, 1914 and Pampanini, 1931); Zawya Al-Qadima-Beida (the present work).

In the Mediterranean region: In 29 out of 34 countries (Ros et al., 1999).

In the world: Mediterranean region, Caribbean, Iraq, Jamaica and New Zealand (Crum & Bartram, 1958; Wijk et al., 1959-1969; Agnew & Vondráček, 1975; Beever et al., 1992 and Ros et al., 1999).

T. muralis Hedw.

One gathering (378b YLZ), on wet limestone, in shade under trees.

Distribution

In Libya: Shahet, Borgo, Bosco Zorda, Tecniz , Al Marj, Tobruk, Darnah, Beida and Tropili (Bottini, 1914 and Pampanini, 1931); Zawya Al-Qadima-Beida (the present work) .

In the Mediterranean region: In all 34 countries (Ros et al., 2013).

In the world: Mediterranean region, Australia, Brazil, Canada, Egypt, Iraq, Japan, Namibia, New Zealand, Philippines, South Africa and United States (Haring, 1961; Lampton, 1970; Lawton, 1971; Breil, 1973; Agnew & Vondráček, 1975; Saito, 1975; El-Saadawi & Badawi, 1977; Peck, 1978; Catcheside, 1980; Ketchledge, 1980; Mahler, 1980; Mahler & Mahler, 1980; Iwatsuki, 1991; Magill, 1981 [1982]; Tan & Iwatsuki, 1991; Beever et al., 1992; Zander, 2007; Forzza, 2010 and Ros et al., 1999).

Trichostomum brachydontium Bruch

One gathering (379 YLZ), on wet limestone, in shade under trees.

Distribution

In Libya: No sites were mentioned; only Libya (Ros et al., 1999); Zawya Al-Qadima-Beida (the present work).

In the Mediterranean region: In 32 out of 34 countries (Ros et al., 1999)

In the world: Mediterranean region, Angola, Azores, Brazil, Canada, Caribbean, China, Colombia, Costa Rica, Guatemala, Hawaiian Isl, India, Japan, Kenya, Madeira, Mexico, Namibia, New Zealand, South Africa, Swaziland, and United States (Wijk et al., 1959-1969; Gangulee, 1972; Saito, 1975; Noguchi & Iwatsuki, 1988; Magill, 1981 [1982]; Norris & Koponen, 1989; Beever et al., 1992; Zander, 1994, 2007; Xing-jiang

& Iwatsuki, 1996; Staples et al., 2004; Forzza, 2010; Delgadillo & Cárdenas, 2011 and Ros et al., 2013).

Weissia controversa var. *crispata* (Nees and Hornsch.) Nyholm

One gathering (380 YLZ), on wet limestone, in shade under trees.

Distribution

In Libya: New record to Libya; Zawya Al-Qadima-Beida (the present work).

In the Mediterranean region: 18 out of 34 countries (Ros et al., 2013).

In the world: Mediterranean region and Iraq (Agnew & Vondráček, 1975 and Ros et al., 2013)

Description

Plants green to light brown below (Fig. 4a,b), 4 mm high. Stems 1.5 mm high, rounded in cross section, and with central strand, sclerodermis little differentiated (Fig. 4k). Leaves crisped to incurved when dry, appressed to weakly spreading when moist,

becoming larger upward, narrowly long lanceolate to oblong lanceolate, 1.6-1.9 mm long, 0.15-0.3 mm wide, gradually tapering from an oblong base (Fig. 4c); apex acute, short mucronate (Fig. 4d); margins plane, incurved to \pm involute toward apex, entire at base to crenulate-papillose above; costa 36-65 μ m wide, excurrent, semicircular to \pm flattened in cross section, with ventral and dorsal stereid bands and 2-8 guides, epidermis differentiated ventrally and little differentiated dorsally (Fig. 4h-j), with quadrate papillose cells on upper ventral surface of costa, elongate papillose cells on dorsal surface of costa (Fig. 4f); upper laminal cells quadrate, hexagonal, 6-12 μ m long, 6 μ m wide, strongly papillose, evenly thick walled (Fig. 4e); basal laminal cells linear to long rectangular, 24-30 μ m long, 6-12 μ m wide, smooth, with thin walls (Fig. 4g). Seta 6 mm long; capsule elliptical, with small mouth, erect, orange-brown, slightly furrowed when dry (Fig. 4m); lid long and narrowed, conical, persistent (Fig. 4l); peristome rudimentary (Fig. 4n). Spore, brown, papillose, 18 μ m in diameter (Fig. 4o).



Fig. 4. a-o, *Weissia controversa* var. *crispata*: a- Dry gametophyte carrying sporophyte. b- Wet gametophyte carrying sporophyte. c- Leaf. d- Leaf apex. e- Upper marginal cells. f- Ventral surface of costa. g- Cells at leaf base. h,i,j- Different cross sections of a leaf. k- Cross section of a stem. l- Lid. m- Capsule mouth. n- Part of peristome teeth. o- Spore.

Scale bar = 0.2 mm (a) & (b), 0.33 mm (c), 6.5 mm (d), 42 μ m (e), 20 μ m (f), 63 μ m (g), 30 μ m (h), 51 μ m (i), 25.7 μ m (j), 65 μ m (k), 226 μ m (l), 147 μ m (m), 24 μ m (n), 4.5 μ m (o).

Weissia controversa var *crispata* is relatively similar in form to *W. condensata* (Voit) Lindb which was recorded previously (Zodda, 1913) from Libya. But the long lanceolate leaf, narrower costa at base and capsule with rudimentary peristome distinguishes it easily from *W. condensata*.

Investigation of the rest of the collected moss specimens is going on at present and there is great hope in making many new records under different families as well as in confirming many of the old ones.

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رصد أنواع من الفصيلة البوتياوية جديدة على الفلورا الحزازية بلبيبا

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تحتوي الفصيلة البوتياوية على ما يصل إلى 5,311 نوعا منتشرة في جميع انحاء العالم. وهي أكبر فصيلة من الحزازيات في ليبيا حيث يبلغ عددها 41 نوعا من أصل 98 نوعا معروفة من هذا القطر. معظم هذه الأنواع هي سجلات قديمة جدا نشرت قبل عام 1932. في البحث الحالي تم تسجيل 20 نوعا منها نوعان جديداً على ليبيا هما: *Microbryum rectum* (With.) R.H.Zander and *Weissia controversa* var. *crispata* (Nees and Hornsch.) Nyholm. تم وصف وتصوير النوعين الجديدين مع الإشارة إلى التوزيع الجغرافي وتعليقات موجزة على جميع الأنواع التي تم رصدها.