

Identity of North African endemic bryophytes, 1

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SUMMARY

Ten taxa of Pottiaceae considered endemic to North Africa have been studied and typified. Nine are newly synonymized with other well-known taxa. A new combination is proposed: *Weissia condensata* var. *armata* (Thér. & Trab.) M.J.Cano, Ros & J.Guerra. The distribution of *Acaulon triquetrum* var. *desertorum* (Besch.) Jelenc and *Weissia condensata* var. *armata* are respectively extended to Europe and the African continent. *Barbula muralis* var. *obovata* Schimp. is a misprint in the publication of the taxon. Two *nomina nuda*, *Tortula cuneifolia* var. *caulescens* Jelenc and *Tortula cuneifolia* var. *pilifera* Jelenc have no taxonomic value.

KEYWORDS: typification, endemic bryophytes, Pottiaceae, North Africa.

INTRODUCTION

Based on a recent bryophyte checklist of Northern Africa (Ros, Cano & Guerra, 1999), a high number of taxa (62, 10.1% of the total recorded) have been revealed to be endemic. This number is very high compared with nearby Mediterranean areas, such as the Iberian Peninsula (2.9%). This is because many were described in the first part of the 20th century and have subsequently been ignored, and their identity is doubtful. In all, 46% of these endemic taxa are of infraspecific rank, which also seems too high. We have started a study of the identity of the endemics belonging to the family Pottiaceae, because it is widely represented in the area and shows the highest number of endemic taxa (27), of which only 11 are species (Table 1).

The type material of ten taxa, two *nomina nuda* and a doubtful name deposited in the herbaria BM, PC and Z have been studied, although, to date, we have not been able to locate types of the remaining endemic Pottiaceae. In many cases, especially in Bescherelle's herbarium, types have not been found in the herbaria where the material of the author is deposited. The types that Jelenc fixed cannot be studied because his herbarium was destroyed.

This paper is one of a series that will attempt to evaluate North African endemics.

IDENTITY OF THE ENDEMICS STUDIED

Of the ten taxa whose type collection has been found for this paper, none is endemic to North Africa. Many of the

endemics were based on slight morphological modifications of no taxonomical value, or misinterpretations of the material.

Acaulon triquetrum var. *desertorum* (Besch.) Jelenc, Bull. Soc. Géogr. Archéol. Oran 76: 56. 1952.

Sphaerangium triquetrum (Spruce) Schimp. var. *desertorum* Besch., J. Bot., rédigé par une société de botanistes 8: 43. 1 f. 9–11. 1894.

Type: Tunisie, talus de sable de l'Oasis de Gabès, 1^{er} février 1893, Patouillard (BM!, lectotype, selected here)

This material shows a set of characters that does not match any previously known taxa of the genus *Acaulon* Müll.Hal. The plant is not triangular and possesses a lengthwise excurrent costa, smooth laminal cells and spores 25–30 µm in diameter. Studying material of this genus from MUB, we found a sample from Southern Spain (Granada) that shows the same characteristics as the African material (Granada: saladar entre Cúllar y Baza, km 165, WG 3054, 880 m, 1 February 1990, Ros & Guerra, MUB 4283). This additional record extends the known distribution of this taxon to the south of the Iberian Peninsula and therefore cannot be considered as endemic from Northern Africa.

Barbula elata Durieu & Mont. ex Müll.Hal., Syn. 1: 620. 1849. *Tortula elata* (Müll.Hal.) Durieu & Mont., Ann. Sci. Nat., Bot., sér. 3, 12: 318. 1849.

Type: Algérie (PC!, lectotype, selected here) *syn.*

Table 1. Taxa of Pottiaceae considered to date as endemic, excluding the nomina nuda. Bold print denotes type specimens were studied.

1. <i>Acaulon triquetrum</i> var. <i>desertorum</i> (Besch.) Jelenc
2. <i>Astomum crispum</i> var. <i>minus</i> Jelenc
3. <i>Barbula commutata</i> var. <i>erosa</i> Corb.
4. <i>Barbula ehrenbergii</i> var. <i>immersa</i> Trab. ex Jelenc
5. <i>Barbula ehrenbergii</i> fo. <i>laxissima</i> P. de la Varde
6. <i>Barbula elata</i> Durieu & Mont. ex Müll.Hal.
7. <i>Barbula gattefossei</i> P. de la Varde
8. <i>Barbula trabutii</i> Jelenc nom. inval. descr. gall.
9. <i>Didymodon vinealis</i> var. <i>viridis</i> Jelenc
10. <i>Didymodon tophaceus</i> var. <i>cucullatus</i> Bott.
11. <i>Didymodon tophaceus</i> fo. <i>elato-lingulata</i> Boulay
12. <i>Eucladium verticillatum</i> var. <i>clinotheca</i> (Besch.) Paris
13. <i>Gymnostomum calcareum</i> var. <i>obtusum</i> Boulay
14. <i>Hymenostomum tortile</i> var. <i>tunetana</i> Besch.
15. <i>Hymenostomum subrostellatum</i> Schimp. ex Besch.
16. <i>Hyophila pampanini</i> Zodda
17. <i>Hyophila perpusilla</i> Thér. & Trab.
18. <i>Pottia truncata</i> fo. <i>archidioides</i> (Paris) Besch.
19. <i>Pterygoneurum ovatum</i> var. <i>perraldieri</i> Besch.
20. <i>Stegonia mouretii</i> (Corb.) Broth.
21. <i>Stegonia mouretii</i> var. <i>crinita</i> Corb. ex Jelenc
22. <i>Tortella elkantarensis</i> Thér. & Trab.
23. <i>Tortella inclinata</i> var. <i>brachypoda</i> (Besch.) Paris
24. <i>Tortula humillima</i> Cardot & Copp.
25. <i>Tortula mairei</i> Thér. & Trab.
26. <i>Tortula wilczekii</i> Meyl.
27. <i>Trichostomum crispulum</i> var. <i>armatum</i> (Thér. & Trab.) Bizot

nov. = *Didymodon vinealis* var. *flaccidus* (Bruch & Schimp.) R.H.Zander

The type collection of *Barbula elata*, as well as that of *Tortula elata*, has been identified as *Didymodon vinealis* var. *flaccidus*. They present flexuose or slightly twisted leaves when dry, and the areolation and papillosity characteristic of this taxon. In the original description of *T. elata*, Montagne (1849) compared this species with *D. vinealis*, from which it can be distinguished by 'sa tige plus élancée, ses feuilles lâchement imbriquées et proportionnellement plus grandes, autrement colorées, enfin par son péristome plusieurs fois contourné'. However, these characters can be included in the variation showed by *Didymodon vinealis* var. *flaccidus*.

Barbula gattefossei P. de la Varde, Ann. Cryptog. Exot. 7: 195. 196. 1934.

Type: Maroc, Kasba Cheik Saïd, 12.1.1934, *J. Gattefossé* (Herb. Potier de la Varde in PC!, lectotype, selected here) *syn. nov.* = *Barbula unguiculata* Hedw.

Potier de la Varde mentioned that this species is close to *Barbula unguiculata*, from which it differs by 'ses feuilles étroitement révoluées dans la plus grande partie, planes seulement vers le sommet, par la nervure nettement papilleuse sur le dos dans le tiers supérieur, par le mucron court'. However, all these characters may be included in the variation shown by the widespread *B. unguiculata*. According to Touw & Rubers (1989) the dimensions,

colour, leaf, capsule, cell form and the degree to which the leaf margins are recurved are very variable in this species.

P. Sollman (personal communication), from data and observations that he very kindly shared with us, reached the same conclusion with regard to the identity of *Barbula gattefossei*.

Eucladium verticillatum var. *clinotheca* (Besch.) Paris, Ind. Bryol. 439. 1896. *Eucladium verticillatum* fo. *clinotheca* Besch., Cat. Mouss. Algérie, 1882.

Type: Algérie, Tlemcen, rochers humides, juin 1842, Durieu (PC!, lectotype, selected here) *syn. nov.* = *Eucladium verticillatum* (Hedw.) Bruch & Schimp.

The presence of a short seta and an inclined capsule were the features on which the description of this variety was based. However, in the type collection the length of the seta varies from one plant to another and only some show an inclined capsule. This taxon therefore has no taxonomic value.

Hyophila perpusilla Thér. & Trab., Bull. Soc. Hist. Nat. Afrique N. 21: 29. 1930.

Type: Maroc, Djebel Amsitten, roch calc, Maire n°1994 (Herb. Trabut in PC!, lectotype, selected here). = *Gymnostomum* sp. (*Gymnostomum mosis* Lorentz or *Gymnostomum lanceolatum* M.J.Cano, Ros & J.Guerra)

The sample studied belongs without any doubt to the genus *Gymnostomum* Nees & Hornsch. and presents one outstanding characteristic, the presence of a bistratose margin, which never occurs in the genus *Hyophila* Brid. On the basis of this character and the form of the leaf, we conclude that it is *G. mosis* Lorentz or *G. lanceolatum* M.J.Cano, Ros & J.Guerra. However, due to the poor development of the material and the fact that there are no sporophytes or perichaetial leaves, it is not possible to reach a firm conclusion.

Stegonia mouretii var. *crinita* Corb. ex Jelenc, Bull. Soc. Hist. Nat. Afrique N. 46: 112. 1955.

Type: Sfax, janvier 1904. Corbière (Herb. Trabut in PC!, lectotype, selected here) *syn. nov.* = *Pterygoneurum ovatum* (Hedw.) Dixon

The presence in the lectotype of unbranched photosynthetic lamellae over the ventral surface of the leaf costa, a hyaline hair-point at its apex and a capsule lacking peristome teeth, clearly indicate that this taxon is *Pterygoneurum ovatum* (Hedw.) Dixon. This sample has already been revised by R. H. Zander (det. 1986), who came to the same conclusion, although this was never published. Unfortunately, the type material of *Stegonia mouretii* has not yet been found and its identity is still uncertain.

Tortella elkantarensis Thér. & Trab., Bull. Soc. Hist. Nat. Afrique N. 21: 29. 1930.

Type: Algérie, El Kantara, *Trabut* (Herb. Thériot in PC!, lectotype, selected here) *syn. nov.* = *Pleurochaete squarrosa* (Brid.) Lindb.

The presence of leaves with the characteristic serrate margins and a hyaline band at the basal margin led us to deduce that this is *Pleurochaete squarrosa*. In the original description, it is mentioned that the apex of the leaf is cucullate, which can only be observed in some leaves. Nevertheless, this feature can also be seen in small and poorly developed samples of this species.

Tortula humillima Cardot & Copp., Bull. Soc. Bot. France 58: 502. 1911.

Type: Grès à Ben Zireg, *Maire* (Herb. Bizot in PC!, lectotype, selected here) *syn. nov.* = *Pottia starckeana* (Hedw.) Müll.Hal.

The presence of ampulose cells in the upper and ventral part of the costa in some leaves is the feature that might have led the authors to suggest a new species of *Tortula*, although this characteristic is also observed in some cases in the species of the *Pottia starckeana* aggregate. However, the specimen has some features that do not match the genus *Tortula*, such as the absence of peristome teeth and the presence of a short apiculate operculum, not typically rostrate. Although the type material has poorly developed sporophytes, the original description allows us to conclude that it is *Pottia starckeana*, because it mentions that the spores are 'irregulares et grosse verrucoso papillosae'. The wavy outline of the spores is also shown in the figures of the species appearing in the paper, as Carrión, Ros & Guerra (1993) described.

Tortula mairei Thér. & Trab., Bull. Soc. Hist. Nat. Afrique N. 22: 162.

Type: rochers volcaniques, Hoggar, rochers volcaniques dessus Oued In Fergan, 2300 m, 7.3.1928, *Maire* 1559 (Herb. Trabut in PC!, holotype, selected here) *syn. nov.* = *Encalypta vulgaris* Hedw.

The material used for the original description of *Tortula mairei* is basically characterized by its leaves, with plane margins, obtuse-rounded and mucronate apex, and densely papillosae upper leaf cells. The basal cells of the leaf are hyaline, do not form an elliptic band, and have transverse walls thickened and yellowish. Although the material lacks capsules and is poorly developed, these features lead us to think that it is a rather small form of *Encalypta* Hedw. The absence of papillae on the dorsal side of the costa, the basal cells with thickened and yellowish transverse walls, and the mucronate apex suggest that this specimen belongs to *Encalypta vulgaris*.

Trichostomum crispulum var. *armatum* (Thér. & Trab.) Bizot, Rev. Bryol. Lichénol. 25: 270. 1956. *Trichostomum armatum* Thér. & Trab., Bull. Soc. Hist. Nat. Afrique N.

22: 160. 2. 1931.

Type: Hoggar: O. Haman, 2000 m, 14.3.1928, *Maire* n° 31 (Herb. Trabut in PC!, syntype, selected here). *Weissia papillosissima* Laz., Dopov. Akad. Nauk Ukraïns'k RSR 1967: 752. f. 1. 1967. *Weissia tortilis* subsp. *papillosissima* Laz. *nom. inval.* not accepted by the author.

Hymenostomum papillosissimum (Laz.) L.I.Savicz, Novosti Sist. Niz. Rast. 6: 248. 1969 [1970].

Type: habitat ad terram argillosam in decliviis jugi Hissarici Rei publicae Sovyeticae Socialisticae Tadzhiokorum in vicinitate urbis Dushanbe ubi cl. U. K. Mamatkulov anno 1966 in locis numerosis legit (Gissarski Khrebet (= Hisor Mts.), Varzob, Gorge of Gushari, 8-III-1966; Gissarski Khrebet (= Hisor Mts.), Varzob, Gorge of Kondara, 19-II-1966). (LE?, LWS? not found) *syn. nov.* = *Weissia condensata* var. *armata* (Thér. & Trab.) M.J.Cano, Ros & J.Guerra *comb. nov.*

The most outstanding feature of this taxon, which led Thériot and Trabut to describe a new species, is the presence on the leaf of long, star-shaped papillae, especially over the median ventral laminal surface and near the costa. This character and the presence of involute margins can be observed in the type material of *Trichostomum armatum*. All these characters are found in *Weissia papillosissima* Laz. This taxon is very close to *Weissia condensata* (Voit) Lindb. from which it can be distinguished by the less incurvate leaves and the presence of long papillae over the ventral surface of the leaves (Moya *et al.*, 1995). After studying the Iberian material of both taxa, we found the taxonomic position problematic because sometimes the papillae are not as high as in *W. papillosissima* and not as short as in *W. condensata*. On the other hand, in the taxonomic revision of the genus *Weissia* Hedw. in the Southwestern United States carried out by Stoneburner (1985), it is mentioned that the papillae of *W. condensata* vary in height and degree of branching. Although she does not mention the conspecificity of *W. condensata* and *W. papillosissima*, it can be deduced from the description. From this fact, it seems more appropriate to subordinate this taxon to *Weissia condensata*.

This taxon was previously only known from Tadhikistan and the Iberian Peninsula (Moya *et al.*, 1995) and therefore constitutes a new record for the African continent [Argelia: Oued Haman (Thériot, 1931), Tazerouk (Jelenc, 1955), Tassili N'Ajjer (Collenot, Dubuis & Faurel, 1960)].

OTHER SPECIMENS STUDIED

We have been able to study the specimens of two *nomina nuda* known to date only from Northern Africa.

Tortula cuneifolia var. *caulescens* Jelenc, Bull. Soc. Géogr. Archéol. Oran *nom. nud.* *Barbula cuneifolia* var. *caulescens* Besch., Cat. Mouss. Algérie. 1882. "Bône, Letourneux" (PC!). = *Tortula cuneifolia* (With.) Turner

The material of *Tortula cuneifolia* var. *caulescens* is mixed with *Tortula cuneifolia* var. *pilifera* and the label does not indicate which plants belong to which variety. After a study of this material, we observed that all the plants are *Tortula cuneifolia* and that there are no unique morphological characters to distinguish either variety. Therefore, this name has no taxonomic value.

Tortula cuneifolia var. *pilifera* Jelenc, Bull. Soc. Géogr. Archéol. Oran nom. nud. *Barbula cuneifolia* var. *pilifera* Besch., Cat. Mouss. Algérie, 1882. "Algérie, La Calle, parois verticales des fossés ... forêt du Touga, 26 mai 1841, Durieu" (PC!). = *Tortula cuneifolia* (With.) Turner

As with the previous specimen, there is no character to distinguish a variety, not even the length of the leaf hair-point. Therefore, this name has no taxonomic value. Moreover, a study of the material from which the record of *Barbula muralis* var. *obovata* Schimp. was published shows that there was a misprint in the publication of the taxon (Sickenberger, 1901) and it corresponds to *Tortula muralis* Hedw. var. *obcordata* (Schimp.) Limpr.

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TAXONOMIC ADDITIONS AND CHANGES: *Weissia condensa* var. *armata* M.J.Cano, Ros & J.Guerra comb. nov. (syn. *Trichostomum armatum* Thér. & Trab., *Weissia papillosissima* Laz.); *Barbula unguiculata* Hedw.

(syn. *Barbula gattefossei* P. de la Varde); *Didymodon vinealis* var. *flaccidus* (Bruch & Schimp.) R.H.Zander (syn. *Barbula elata* Durieu & Mont. ex Müll.Hal.); *Encalypta vulgaris* Hedw. (syn. *Tortula mairei* Thér. & Trab.); *Eucladium verticillatum* (Hedw.) Bruch & Schimp. (syn. *Eucladium verticillatum* var. *clinotheca* (Besch.) Paris); *Pleurochaete squarrosa* (Brid.) Lindb. (syn. *Tortella elkantarensis* Thér. & Trab.); *Pottia starckeana* (Hedw.) Müll.Hal. (syn. *Tortula humillima* Cardot & Copp.); *Pterygoneurum ovatum* (Hedw.) Dixon (syn. *Stegonia mouretii* var. *crinita* Corb. ex Jelenc).

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