

On the presence of *Clasmatodon parvulus* (Bryopsida) in Europe

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Abstract: HERAS, P., INFANTE, M. & BUCK, W. R. 2006. On the presence of *Clasmatodon parvulus* (Bryopsida) in Europe. – *Herzogia* 19: 317–321.

A revision of the Spanish records of *Clasmatodon parvulus* has revealed that all specimens have been misidentified and actually represent *Pseudoleskeella tectorum*. Consequently, *Clasmatodon* must be excluded from the Iberian bryoflora. The morphological characters differentiating *C. parvulus* from the similar-appearing Spanish *P. tectorum* material are described. Because the presence of *C. parvulus* in Europe is based solely on a single 19th century German record, which is currently missing, we recommend that the species be tentatively deleted from the list of European bryophytes.

Zusammenfassung: HERAS, P., INFANTE, M. & BUCK, W. R. 2006. Über das Vorkommen der *Clasmatodon parvulus* (Bryopsida) in Europa. – *Herzogia* 19: 317–321.

Eine Überprüfung der Belege von *Clasmatodon parvulus* aus Spanien hat gezeigt, dass alle vorhandenen Exemplare falsch bestimmt sind und *Pseudoleskeella tectorum* zuzuordnen sind. Demzufolge muss *Clasmatodon* von der Liste der iberischen Moosflora gestrichen werden. Die morphologischen Merkmale, welche *C. parvulus* von der ähnlich erscheinenden spanischen *P. tectorum* unterscheiden, werden beschrieben. Da das Vorkommen von *C. parvulus* in Europa sich auf nur einen einzigen, im 19. Jahrhundert in Deutschland gefundenen Beleg stützt, der zudem nicht mehr auffindbar ist, empfehlen wir, diese Art vorläufig aus dem Verzeichnis der europäischen Moosflora zu entfernen.

Key words: *Pseudoleskeella tectorum*, distribution.

Introduction

Clasmatodon parvulus (Hampe) Sull. (Brachytheciaceae) is a moss which is widely distributed in North America, especially through the southeastern United States, where it is very common (CRUM & ANDERSON 1981, GROUT 1934). Although it had been reported from the West Indies (Cuba), such reports are misidentifications of *Austinia tenuinervis* (Mitt.) Müll. Hal. (BUCK 1998, DUARTE BELLO 1997).

Outside North America, *C. parvulus* has been reported several times from Europe. The first citation was based on a collection by Bertram in 1851 on spruce trunks in Düben (Saxony, Germany) (HUSNOT 1892–94, MÖNKEMEYER 1927), but the species has never been re-found there (MEINUNGER 1992). Later, *C. parvulus* was cited twice from Portugal. However, these records turned out to be based on misidentifications of *Scorpiurium sendtneri* (Schimp.) M. Fleisch. and a mixture of *Leptodon smithii* (Hedw.) F. Weber & D. Mohr and *Cryphaea heteromalla* (Hedw.) D. Mohr (SÉRGIO 1985). Finally, *C. parvulus* was reported twice from Spain, from localities in the Northeast, in Catalonia (Montseny Massif) (CASAS DE PUIG 1954, CASAS SICART 1959, CASAS et al. 2001) and Aragón (Albarracín Range) (CASAS DE PUIG et al. 1976).

The Spanish and German records were the only ones left in Europe, and consequently *C. parvulus* has been considered one of the rarest mosses on the European continent (FREY et al. 1995, DÜLL 1985), and was included as “Endangered” in the Red Data Book of European Bryophytes (ECCB 1995).

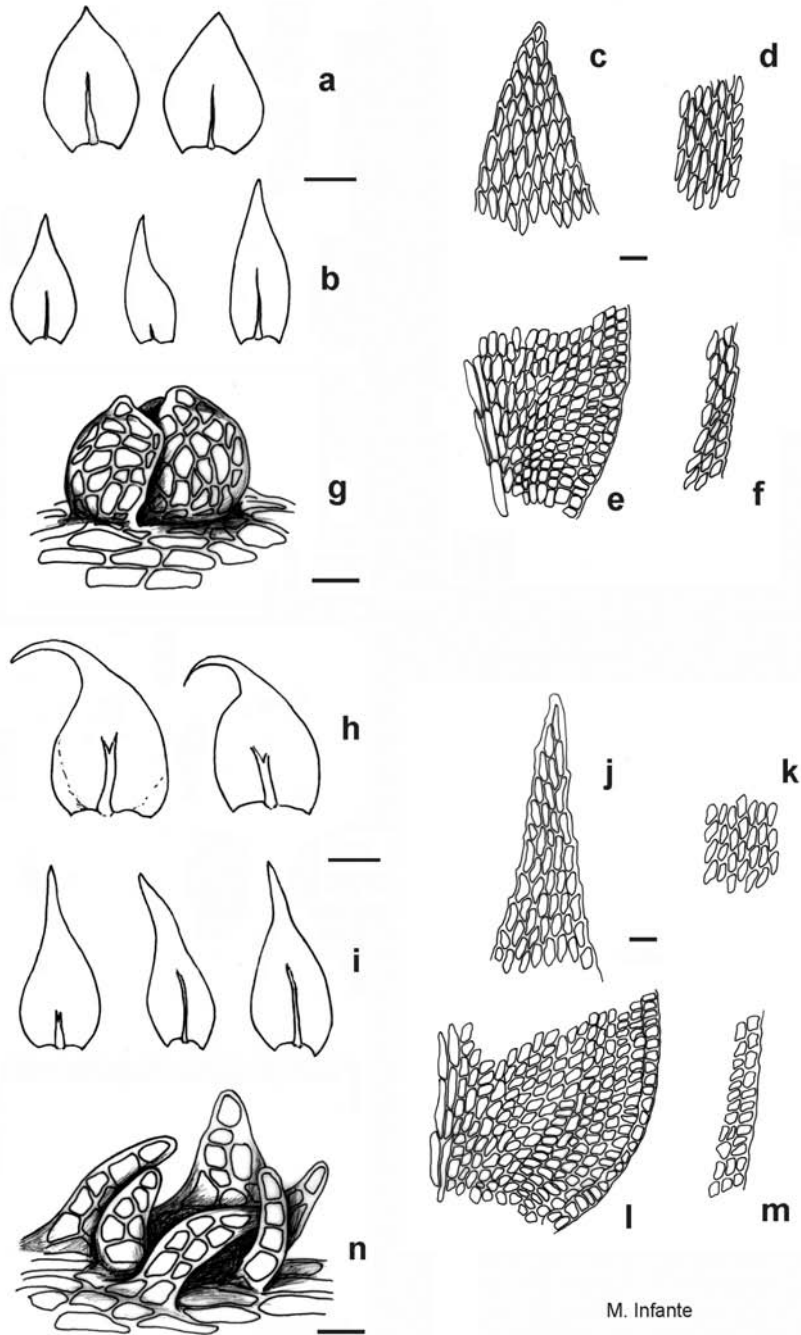
During the preparation of a Red List of Aragonian bryophytes, one of the Spanish specimens of *C. parvulus* was re-identified as *Pseudoleskeella tectorum*. Consequently, a search for the rest of the specimens cited in the European literature as *C. parvulus* was performed.

Results and discussion

A revision of the two Spanish herbarium vouchers of *Clasmatodon parvulus* proved that both are actually *Pseudoleskeella tectorum* (Brid.) Broth.; *C. parvulus* is therefore not present in the Iberian Peninsula. Although these two species are superficially similar, a close examination of the Spanish specimens and a comparison with North American material of *C. parvulus* and literature descriptions (CRUM & ANDERSON 1981, GROUT 1934) revealed some important differences (Table 1, Fig. 1).

Table 1: Characters differentiating North American material of *Clasmatodon parvulus* (VIT 28904 [Buck 33446]) from the Spanish *Pseudoleskeella tectorum* specimens initially misidentified as *C. parvulus* (BCB 1367, 31756).

	<i>Clasmatodon parvulus</i>	<i>Pseudoleskeella tectorum</i>
Plants	Small, slender Light to yellowish green Irregularly branched	Small, rather rigid Very dark green Subpinnately branched
Leaf shape	Stem leaves broadly ovate, broader than branch leaves Branch leaves ovate-lanceolate	Stem and branch leaves strongly dimorphic Stem leaves abruptly narrowed into a curved-reflexed acumen Branch leaves ovate-lanceolate
Leaf size	Stem leaves: 0.5–0.7 × 0.3–0.4 mm Branch leaves: 0.4–0.5(0.7) × 0.1–0.2 mm	Stem leaves: 0.9–1 × 0.4–0.5 mm Branch leaves: 0.6–0.7 × 0.2–0.3 mm
Costa	Slender but always visible, reaching half the leaf length	Variable, from single and strong reaching half the leaf length and forked to very short and double
Leaf margins	Plane Shortly and regularly denticulate at apex	Frequently narrowly recurved at base Entire or irregularly denticulate at apex
Areolation	Lax, thin cell walls, 1.5–2 µm thick	Firm, rather thick cell walls, 2–4 µm thick
Median leaf cells	Oblong-rhomboidal, 17–28 × 6–8(10) µm Smooth	From rhomboidal to oblong-rhomboidal, 20–22 × 5–6 µm Generally bulging or prorate-papillose on the back of the leaf
Alar cells	Quadrangle or rhomboidal, with some oblate cells intermixed, in a wide group almost reaching costa	Mostly oblate, with some quadrangle cells intermixed, in a small group limited to the basal margins
Marginal leaf cells	From rhomboidal to oblong-rhomboidal, with a few shortly rectangular	Quadrangle or shortly rectangular with some patches of oblate cells
Pseudoparaphyllia-like structures	Foliose, broadly ovate	Filamentous, linear-lanceolate
Reproductive characters	Autoicous, with sporophytes	Dioicous, sporophytes not seen



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Fig. 1: Characters differentiating North American material of *Clasmatodon parvulus* from the Spanish specimens of *Pseudoleskeella tectorum*, initially misidentified as *C. parvulus*. *C. parvulus* a–g (VIT 28904 [Buck 33446]). *P. tectorum* h–n (BCB 31756). a, h: stem leaves; b, i: branch leaves; c, j: apex of a stem leaf; d, k: median leaf cells from a stem leaf; e, l: base of a stem leaf; f, m: margin of a stem leaf, all in ventral view; g, n: pseudoparaphyllia-like structures. Scale bars a, b, h, i: 0.25 mm; c–g, j–n: 25 μ m.

Pseudoleskeella tectorum is an uncommon species of the Iberian bryoflora. It has been found in mountainous areas of northeastern Spain (Pyrenees and Iberian Range), epiphytic or epilithic on granitic or limestone substrates, in areas under climatically continental influence. For instance, it is locally widespread in the highlands (“parameras”) of Teruel Province, where several specimens have been gathered that are morphologically similar to the herbarium material mistaken for *C. parvulus*. *Pseudoleskeella tectorum* has also been found very near to the “*Clasmatodon*” locality of Seva, under similar conditions, on the bark of *Quercus ilex* L.

After excluding *C. parvulus* from the Portuguese and Spanish bryofloras, the only remaining European record is the 19th century German citation. At present, this ancient report cannot be confirmed because the relevant herbarium specimen has not been located. However, a very detailed illustration of this species is available in Bryologia Europaea (plate 452 sub *Anisodon perpusillus* B.S.G.). It is worth noting that some of the leaves drawn in this plate are much more longly acuminate than found in typical *C. parvulus* leaves, as seen in North American herbarium specimens or drawn in North American floras, as was already pointed out by HUSNOT (1892–94).

Considering that the sole voucher specimen of *C. parvulus* in Europe (Germany) seems to no longer be extant, that purported material of the species has not been found in Europe since 1851, and that all other European reports of the species have proven to be based on misidentifications, we recommend that the species be tentatively deleted from the list of European bryophytes.

Specimens examined:

Clasmatodon parvulus (Hampe) Sull.

United States. North Carolina: Orange Co., Duke Forest, 35°59'N/79°01'W, along Whitfield Rd. 0.8 mi W of Old Erwin Rd. (SR 1307), mesic hardwood forest along New Hope Creek, W. R. Buck, 25 January 1998 [VIT 28904 (Buck 33446)].

Pseudoleskeella tectorum (Brid.) Broth. (sub *Clasmatodon parvulus* [Hampe] Sull.)

Spain. Barcelona: Seva, on *Quercus ilex*, C. Casas, June 1952 (BCB 31756); Teruel: Toril, on *Juniperus thurifera*, 1450 m, C. Casas, 2 April 1974 (BCB 1367).

Pseudoleskeella tectorum (Brid.) Broth.

Spain. Huesca: Alquézar, 31TBG5372, 610 m, old olive tree bases, M. Infante & P. Heras, 26 April 2001 (VIT 27297); Peralta de Calasanz, Nuestra Señora de La Ganza, 31TBG8253, 600 m, old olive tree bases, M. Infante & P. Heras, 24 April 2004 (VIT 27099). Teruel: summit of Javalambre, on *Juniperus sabina*, 2000 m, M. Brugués, 9 April 1976 (BCB 3305); Pitarque, 30TYL0303, 980 m, *Quercus faginea* bases, M. Infante & P. Heras, 25 February 1999 (VIT 22868); Toril, 30TXK2957, 1520 m, calcareous rocks under open *Juniperus thurifera* forest, P. Heras & M. Infante, 24 May 2001 (VIT 27665); Villar del Cobo, Cuesta de Codes, 30TXK1174, 1600 m, “paramera”, on *Juniperus sabina* trunks, M. Infante & P. Heras, 23 May 2001 (VIT 27612). Zaragoza: Nuévalos, Monasterio de Piedra, tree bases, V. Allorge, 6 June 1934 (BCB 18027).

United States. New Mexico: Santa Fé Co., Santa Fé National Forest, 35°34'N/105°44'W, 2231 m, pine-juniper-oak scrub over sandstone, W. R. Buck, 11 August 2001 (VIT 28905 [Buck 39824]).

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References

- BUCK, W. R. 1998. Pleurocarpus mosses of the West Indies. – *Memoirs of the New York Botanical Garden* **82**: 1–400.
- CASAS DE PUIG, C. 1954. Associations de bryophytes corticicoles de Catalogne. – *Huitième Congrès International de Botanique, Rapports et Communications*: 103–105.
- CASAS SICART, C. 1959. Aportaciones a la flora briológica de Cataluña. Catálogo de las hepáticas y musgos del Montseny. – *Anales del Instituto Botánico A.J. Cavanilles* **17**: 21–174.
- CASAS, C., BRUGUÉS, M. & CROS, R. M. 2001. Flora dels Briòfits dels Països Catalans. I. Molses. – Barcelona: Institut d'Estudis Catalans.
- CASAS DE PUIG, C., FUERTES, E., SIMÓ, R. M. & VARO, J. 1976. Aportaciones al conocimiento de la flora briológica española. Nótula II: La Sierra de Albarracín. – *Acta Phytotaxonomica Barcinonensia* **21**: 19–39.
- CRUM, H. A. & ANDERSON, L. E. 1981. Mosses of Eastern North America. Vol. 2. – New York: Columbia University Press.
- DUARTE BELLO, P. P. 1987. Musgos de Cuba. – *Fontqueria* **47**: i–xxii, 1–717.
- DÜLL, R. 1985. Distribution of the European and Macaronesian mosses (Bryophytina). Part II. – *Bryologische Beiträge* **5**: 110–232.
- EUROPEAN COMMITTEE FOR THE CONSERVATION OF BRYOPHYTES (ECCB) (ed.) Red Data Book of European bryophytes. – Trondheim: ECCB.
- FREY, W., FRAHM, J. P., FISHER, E. & LOBIN, W. 1995. Die Moos- und Farnpflanzen Europas. – *Kleine Kryptogamenflora, Band IV*: i–xi, 1–426.
- GROUT, A. J. 1934. *Clasmatodon*. – In: GROUT, A. J. (ed.). Moss Flora of North America North of Mexico **3**: 231. – New York, Staten Island: published by the author.
- HUSNOT, T. 1892–1894. Muscologia Gallica. Descriptions & figures des mousses de France et des contrées voisines. Deuxième partie, Pleurocarpes. – Orne: A. Cahan, par Athis.
- MEINUNGER, L. 1992. Endangered bryophytes in the eastern part of Germany. – *Biological Conservation* **59**: 211–214.
- MÖNKEMEYER, W. 1927. Die Laubmoose Europas. Band 4. – In: Dr. L. RABENHORST (ed.). Kryptogamen-Flora von Deutschland, Österreich und der Schweiz. – Leipzig: Akademische Verlagsgesellschaft.
- SÉRGIO, C. 1985. *Clasmatodon parvulus* (Hampe) Sull. espécie a excluir da flora briológica de Portugal. – *Portugaliae Acta Biologica (B)* **14**: 185–186.

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