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New and interesting bryophyte records for Greece

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Abstract – Ten taxa of bryophytes are cited for the first time in Greece: *Acaulon triquetrum* (Spruce) Müll. Hal., *Didymodon sicculus* M.J. Cano, Ros, García-Zamora & J. Guerra, *D. trivialis* (Müll. Hal.) J. Guerra, *Grimmia longirostris* Hook., *Gymnostomum lanceolatum* M.J. Cano, Ros & J. Guerra, *Lophozia excisa* (Dicks.) Dumort., *Microbryum piptocarpum* (Durieu & Mont.) J. Guerra & M.J. Cano, *Syntrichia minor* (Bizot) M.T. Gallego, J. Guerra, M.J. Cano, Ros & Sánchez-Moya, *Tortula israelis* Bizot & F. Bilewsky and *T. viridifolia* (Mitt.) Blockeel & A.J.E. Sm. Some additional taxa that were previously known only from the Greek Islands (Crete, Aegean Islands, Ionian Islands or Rhodes) have been recorded in mainland Greece or Évvia Island: *Athalamia hyalina* (Sommerf.) S. Hatt., *Bryum subapiculatum* Hampe, *Ditrichum subulatum* Hampe and *Fossombronia pusilla* (L.) Dumort. The presence of *Tortula subulata* var. *subinermis* in Greece is confirmed.

bryophytes / Mediterranean flora / Greece

Resumen – Se citan 10 taxones de briófitos por primera vez para Grecia: *Acaulon triquetrum* (Spruce) Müll. Hal., *Didymodon sicculus* M.J. Cano, Ros, García-Zamora & J. Guerra, *D. trivialis* (Müll. Hal.) J. Guerra, *Grimmia longirostris* Hook., *Gymnostomum lanceolatum* M.J. Cano, Ros & J. Guerra, *Lophozia excisa* (Dicks.) Dumort., *Microbryum piptocarpum* (Durieu & Mont.) J. Guerra & M.J. Cano, *Syntrichia minor* (Bizot) M.T. Gallego, J. Guerra, M.J. Cano, Ros & Sánchez-Moya, *Tortula israelis* Bizot & F. Bilewsky y *T. viridifolia* (Mitt.) Blockeel & A.J.E. Sm. Algunos taxones que sólo eran conocidos hasta ahora de algunas de las islas griegas (Creta, Islas del Egeo, Islas Jónicas o Rodas), han sido recolectadas en Grecia continental o en la isla de Évvoia: *Athalamia hyalina* (Sommerf.) S. Hatt., *Bryum subapiculatum* Hampe, *Ditrichum subulatum* Hampe y *Fossombronia pusilla* (L.) Dumort. También se confirma la presencia en este país de *Tortula subulata* var. *subinermis*.

briófitos / flora Mediterránea / Grecia

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INTRODUCTION

Bryology has long been a neglected subject in Greece, primarily because there has been no sustained research by a resident or professional bryologist, and this is still the case today. However, as an easy accessible and popular destination, many foreign bryologists have visited Greece (both the mainland and the islands) and collected bryophytes there. Consequently most of the data on bryophytes within the territory derive from foreign investigators.

According to the checklist of Düll (1995), the Greek bryoflora comprises ca 700 taxa, of which 4 are hornworts, 151 are liverworts and 537 are mosses. However, a few further taxa can be added to this list as newly recorded or confirmed for Greece and Crete (Blockeel, 2001; Carratello & Aleffi, 1998; Gallego & Cano, 1998; Novotný *et al.*, 2000; Papp *et al.*, 1997, 1998; Turland & Wilson, 1995; Werner, 1998), or not included in the report of Düll (1995), such as Athanasiadis (1977) and Blockeel (1991). Also Schumacker & Vána (2000) includes data about the distribution of the liverworts and hornworts in Greece. Some interesting data concerning bryology and bryophyte protection in Greece can be found in Sabovljević *et al.* (2001).

METHODOLOGY

Several field expeditions were made by the authors. T.L. Blockeel visited Pelopónnisos in 1995 and the island of Évvia in 2000. The remaining authors made two trips, one in March 1999 to the southern part of Greece and the second in July/August 1999 to the central and northern parts. Although these surveys ranged over a wide area, the new and interesting taxa cited here were limited to Pelopónnisos, Sterea Elláda, Évvia and Thessalía (Fig. 1). The specimens are deposited at MUB and in the private herbarium of T.L. Blockeel.

Site Details

1. PELOPÓNNISOS: From Egira to Oassi, 38°07'47" N, 22°20'43" E, 250 m, riverbed with *Platanus orientalis* L., 21.03.1999, *M.J. Cano, J. Muñoz, R.M. Ros & M. Sabovljević.*

2. PELOPÓNNISOS: Méthana Peninsula, 37°35'43" N, 23°20'40" E, 50 m, *Olea europea* L. cultures with *Ceratonia siliqua* L., *Pistacia lentiscus* L. and *Quercus coccifera* L. 15.03.1999, *M.J. Cano, J. Muñoz, R.M. Ros & M. Sabovljević.*

3. PELOPÓNNISOS: Méthana Peninsula, crater of Ifestos, 37°37'30" N, 23°21'30" E, bouldery ground of volcanic tuff with shrubs, 15.04.1995, *T.L. Blockeel.*

4. PELOPÓNNISOS: Argolida, site of ancient Asini, ca 7 km SE of Nafplion, 37°30'50" N, 22°51'30" E, ca 50 m, limestone headland with *Euphorbia dendroides* L., 08.04.1995, *T.L. Blockeel.*

5. PELOPÓNNISOS: Ahaia, Mt Aroania (Helmos), on the approach to Xirokambos, 38°01' N, 22°10'30" E, ca 1300-1500 m, *Abies cephalonica* Loudon woodland, 18.04.1995, *T.L. Blockeel.*

6. PELOPÓNNISOS: Ahaia, Mt Aroania (Helmos), on the approach to Xirokambos, 38°01' N, 22°10'30" E, ca 1000 m, *Abies cephalonica* woodland, 18.04.1995, *T.L. Blockeel.*

7. PELOPÓNNISOS: Arkadia, Mt Parnon range, ca 3 km south-west of Kosmas, 37°05'10" N, 22°43'40" E, ca 1050 m, open woodland and maquis on limestone, 11.04.1995, *T.L. Blockeel.*

Fig. 1. Map of Greece showing the geographic situation of the sites studied.

8. PELOPÓNNISOS: Arkadia, Dafnon Valley, below Moni Elonis, 14 km west of Leonidi, 37°08'50" N, 22° 46' E, bank of stream on limestone, 14.04.1995, *T.L. Blockeel.*

9. PELOPÓNNISOS: Lakonia, Mani Peninsula, west of Hosiari, 36°42'40" N, 22°28'30" E, maquis on exposures of phyllites, 12.04.1995, *T.L. Blockeel.*

10. STEREA ELLÁDA: Athina, Acropolis, 37°58' N, 23°43' E, 350 m, nitrophilous vegetation, 14.03.1999, *M.J. Cano, J. Muñoz, R.M. Ros & M. Sabovljević.*

11. STEREA ELLÁDA: Oros Párnitha, 38°08'22" N, 23°43'41" E, 750 m, *Quercus coccifera* wood with *Pinus halepensis* Mill., *Arbutus unedo* L. and *Rhamnus alaternus* L.,14.03.1999, *M.J. Cano, J. Muñoz, R.M. Ros & M. Sabovljević.*

12. STEREA ELLÁDA: Oros Párnitha, 38°08'56" N, 23°43'11" E, 950 m, *Abies cephalonica* wood with *Quercus coccifera* and *Berberis* sp., 14.03.1999, *M.J. Cano, J. Muñoz, R.M. Ros & M. Sabovljević.*

13. STEREA ELLÁDA: Oros Párnitha, 38°10'08" N, 23°43'27" E, 1150 m, *Abies cephalonica* wood with *Berberis vulgaris* L. and *Pinus brutia* Ten., 14.03.1999, *M.J. Cano, J. Muñoz, R.M. Ros & M. Sabovljević.*

14. STEREA ELLÁDA: road from Eratini to Galaxidi, 38°21'03" N, 22°20'40" E, 100 m a.s.l., unprotected soils on limestones, 22.03.1999, *M.J. Cano, J. Muñoz, R.M. Ros & M. Sabovljević.*

15. STEREA ELLÁDA: Delphi, 38°28'58" N, 22°30'16" E, 500 m, limestone walls and taluses with *Arbutus unedo*, 22.03.1999, *M.J. Cano, J. Muñoz, R.M. Ros & M. Sabovljević.*

16. ÉVVIA: By the road to Mantoudi, between Pagondas and Prokopi, 38°41' N, 23°32'30" E, 400-500 m, 29.02.2000, *T.L. Blockeel.*

17. THESSALÍA: Oros Pilio, Kato Gadzea, 39°18'46" N, 23°05'40" E, 35 m, *Olea europea* cultures with *Pistacia lentiscus*, *Quercus coccifera* and *Calicotome* sp. on basic rocks mixed with schists, 23.03.1999, *M.J. Cano, J. Muñoz, R.M. Ros & M. Sabovljević.*

18. THESSALÍA: Oros Pilio, Argalasti, 39°12'38" N, 23°12'57" E, 250 m. *Olea europea* cultures with *Pistacia lentiscus*, *Cistus salviifolius* L. and *Rhamnus alaternus*, 23.03.1999, *M.J. Cano, J. Muñoz, R.M. Ros & M. Sabovljević.*

RESULTS

Acaulon triquetrum (Spruce) Müll. Hal. – Sites 4 and 17

According to Düll (1995) the reported presence of this species in Greece is due to Preston's treatment of *A. triquetrum* as synonymous with *A. piligerum* (De Not.) Limpr. (Preston, 1984). In fact the latter report was based on material of *Phascum cuspidatum* Hedw. var. *piliferum* (Hedw.) Hook. & Taylor, and therefore *A. triquetrum* has not been recorded previously for Greece.

Athalamia hyalina (Sommerf.) S. Hatt. – Sites 6 and 7

In Greece it was known from Crete (Düll, 1966), but has not previously been recorded from the mainland.

Bryum subapiculatum Hampe – Site 15

The only previous record of this species in Greece is from the Ionian Islands, but according to Düll (1995) the record is unpublished, being based on a personal communication of Kutzelnigg to Düll.

Didymodon sicculus M.J. Cano, Ros, García-Zamora & J. Guerra – Sites 1, 11, 14 and 15

This species was previously known only from loamy and gypsiferous soils in the south-eastern part of the Iberian Peninsula (Cano *et al.*, 1996b) and the Balearic Islands (Cano *et al.*, 2001). It is a xerophilous species like *D. luridus*, but it presents a set of characters which are not found in the former taxon: leaves with the upper laminal cells papillose, 6-14 μm wide, occasionally bistratose, with rectangular basal cells and the margins recurved from near the apex to the base.

Didymodon trivialis (Müll. Hal.) J. Guerra - Site 10

This species shows an interesting disjunction between S. Africa and the Mediterranean area (Guerra & Ros, 1987), where it has been reported only from Spain and Jordan (Frey & Kürschner, 1993). It can be distinguished from the related species of the genus by its triangular-lanceolate leaves and the absence of a hyalodermis in the stem.

Ditrichum subulatum Hampe – Site 9

The previous reports of this species in Greece have been from the islands of Crete and Corfu (Kerkira) (Düll, 1966; Hararas, 1976). It is new to the mainland.

Fossombronia pusilla (L.) Dumort. – Sites 2 and 17

This species was previously known in Greece only on several of the islands (Crete, Aegean Islands, Ionian Islands and Rhodes) (Düll, 1995). It is new to the mainland.

Grimmia longirostris Hook. – Site 3

Although this is a widely distributed montane species in Europe, its occurrence in a Mediterranean environment in southern Greece is unexpected. It is a new species for Greece.

Gymnostomum lanceolatum M.J. Cano, Ros & J. Guerra – Sites 8, 10 and 18

This species was originally described from S.E. Spain, where it is a common species (Cano *et al.*, 1994). Subsequently, it has also been found in Turkey and Croatia by Kučera (1998), the Balearic Islands (Cano *et al.*, 2001), and Morocco (Jiménez *et al.*, in press). The most important morphological characters distinguishing it from other species of the genus are the long lanceolate perichaetial leaves and the bistratose leaf margins.

Lophozia excisa (Dicks.) Dumort. – Site 5

Widely distributed in northern and central Europe, this species is confined to montane habitats in the Mediterranean region. It is new to Greece.

Microbryum piptocarpum (Durieu & Mont.) J. Guerra & M.J. Cano – Site 17

This is a rare cleistocarpous Pottiaceous species first described from Algeria and later found in S. Spain (Guerra *et al.*, 1991) and N.E. Spain (Brugués *et al.*, 1993; Casas *et al.*, 1993). The record from Greece is a very interesting discovery which extends its distribution eastwards in the Mediterranean basin. It has as distinguishing characters an exserted, ovoid-oblong capsule, with a distinct apiculus 100 μm long. Some additional specimens were also collected which are very close morphologically to *M. piptocarpum*, but which have spores that do not correspond with those described for this species by Guerra *et al.* (1991). Equally they do not fit any other known taxa of the genus. The origin of such discordant plants is unknown but the authors do not reject the possibility of a hybrid origin, as described in some related species, e.g. *Pottia andalusica* Ros & R. Oliva (Ros *et al.*, 1994), *Pottia starckeana* (Hedw.) Müll. Hal. (Ros *et al.*, 1996) and *Pterygoneurum subsessile* (Brid.) Jur. var. *kieneri* Habeeb (Guerra *et al.*, 1994).

Syntrichia minor (Bizot) M.T. Gallego, J. Guerra, M.J. Cano, Ros & Sánchez-Moya – Site 14

This species is close to *S. virescens* (De Not.) Ochyra, but it can be distinguished primarily by the type of papillosity in the laminal leaf cells (*S. minor* has 1 papilla per cell, pedicellate and branched at the apex, 12-17 μm in length; *S. virescens* has 2-4(5) bifurcate papillae, not exceeding 5 μm in length). It was reported new for the European continent by Gallego *et al.* (2000). Outside Europe, it is known only from Cyprus (Blockeel, in press) and Lebanon.

Tortula israelis Bizot & F. Bilewsky – Site 10

This Mediterranean species is known from several localities in Spain, Israel, Cyprus, Turkey (Cano *et al.*, 1996a, Fuertes *et al.*, 1998) and Italy (Gueli *et al.*, 2001, Oliva, 1999). Its presence in Greece was therefore to be expected. The presence of high mamillae on both the adaxial and abaxial leaf surface differentiate it from *Tortula muralis* Hedw., which can be considered its most closely related taxon in the genus.

Tortula subulata Hedw. **var. *subinermis*** (Bruch & Schimp.) Wilson – Sites 10 and 12

According to Düll (1984) this taxon has been cited for Greece, but it was not included in his later checklist (Düll, 1995). Our record confirms its presence in Greece.

Tortula viridifolia (Mitt.) Blockeel & A.J.E. Sm. – Site 16

This is a rather rare but widely distributed species in southern and western Europe. It is new to Greece.

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