

A checklist of the bryophytes of Corsica (France): new records and a review of the literature

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SUMMARY

Based on a thorough review of the literature as well as floristic surveys undertaken over 20 years, a checklist of the bryophytes of Corsica, a mountainous western Mediterranean island, is presented. The occurrence of 17 liverwort and 44 moss species is documented for the first time from Corsica. As a result, the Corsican bryoflora includes 540 species: 148 liverworts, three hornworts and 389 mosses. Among the species reported, seven liverwort and 17 moss species are red-listed in Europe. By contrast with angiosperms, no bryophyte is endemic to the island based on traditional, phenetic species concepts. The number of new species reported here indicates that Corsica is exceedingly under-recorded bryologically. A better knowledge of the distribution, frequency and ecology of bryophyte species on the island is thus an absolute prerequisite in order to propose appropriate conservation measures in this Mediterranean environment that is, at least locally, severely threatened.

KEYWORDS: Corsica, bryoflora, Mediterranean, island endemism.

INTRODUCTION

Mediterranean areas of the world are noteworthy for their exceedingly high diversity and proportion of endemics in higher plant species (Cowling *et al.*, 1996). In bryophytes, conversely, it is only comparatively recently that Mediterranean areas have been the focus of detailed floristic inventories and taxonomic studies, revealing the existence of rare liverwort (Bischler, 2004; Duckett & Ligrone, 2006) and moss species of high conservation value (Hébrard, 2003b; Lara *et al.*, 2003, 2004; Pócs *et al.*, 2004; Draper *et al.*, 2005) and of previously undescribed taxa (Draper *et al.*, 2003, Erdag, Kürschner & Parolly, 2004; Jimenez *et al.*, 2004; Sérgio, 2006). The figures of species diversity and level of endemism are, however, still very far from those documented in angiosperms. In Corsica for example, 2092 vascular plant species, including 131 strictly endemic to the island (>5% of the native flora) and another 75 species only found in Corsica and the neighbouring island, Sardinia, have been recorded (Gamisans & Jeanmonod, 1993). In bryophytes, no endemic species has been reported to date and there is a complete lack, apart from a catalogue of the liverworts by Bischler & Jovet-Ast

(1973) and scattered floristic notes, of a systematic documentation on the species that exist on the island.

In this paper, we present the first checklist of the Corsican bryoflora based on a thorough review of the literature and original floristic records made in the course of several field surveys undertaken since the 1980s.

STUDY AREA

Corsica is a Mediterranean island of 8743 km² lying between 40°01' and 41°20' N and between 8°38' and 9°34'E. It comprises two French departments, namely Corse-du-Sud (2A) and Haute-Corse (2B), both of which are included within UTM 32T. Corsica has been separated from the European continent, currently distant by 82 km, for at least 4 My. With an average elevation of 568 m, it is the most mountainous of the western Mediterranean islands.

Geologically, Corsica comprises two contrasting rock formations that include acid rocks such as granites, rhyolites and gneiss in the western part of the island and more base rich alpine rocks (mica-schist, schist with gabbro and serpentine intrusions) in the east. These two main

formations are separated by a central furrow of sandstone and other sedimentary deposits dating back to Mesozoic and Tertiary periods. In addition to those main geological formations, a flat fringe of Quaternary deposits lies along the eastern coast and several small calcareous formations are scattered across the island.

The Corsican massif is made of eight mountain ranges with a southern–northern orientation, four of which are >2000 m high. Monte Cinto, the highest Corsican peak, culminates at 2710 m. About 15 streams and their tributaries descend from those mountain ranges. The streams, which are mostly 20–25 km long, are characterized by a torrential regime with sudden discharge peaks followed by periods of drought.

The main characteristics of the successive vegetation belts are described in Table 1.

METHODS

For liverworts, the catalogue of Bischler & Jovet-Ast (1973) was used as a basis and completed and/or amended when necessary by all subsequent publications mentioning Corsican bryophytes by Geissler (1981), Hébrard (1974, 1975a, b, 1976, 1977a, b, 1978, 1980, 1981, 1984, 1986, 1988, 1993, 1998, 2000, 2003a, b, 2004, 2005), Düll (1983), Loiseau & Pierrot (1986), Pierrot (1987) and Skrzypczak (2005). For mosses, a thorough analysis of publications by Allorge (1926), Camus (1895, 1902, 1903), de Litardière & Malcuit (1926), de Litardière (1909, 1927, 1929), Geissler (op. cit.), Gillot (1878a, b), Hébrard (op. cit.), Hillier (1931), Parriat (1951) and Sarrassat (1931a, b) was undertaken to complete the information given by Düll (1984, 1985). The data included in those references were updated with subsequent publication by Greven (1995), Hébrard (op. cit.), Loiseau & Pierrot (op. cit.), Pierrot (op. cit.), Skrzypczak (op. cit.) and Blockeel *et al.* (2002, 2006). A further contribution to the Corsican bryoflora, the inventory of M. Romagnoli's herbarium (Mary-Conrad,

1996–1997), was not taken into account pending a thorough revision of the 34 collections (two-thirds of them identified) made in the middle of the 19th century.

Original records resulting from our observations made in the course of numerous field trips between 1981 and 2005 were added to the literature data. Moreover, the LG herbarium, which contains numerous Corsican collections of J.-L. De Sloover and J. Lambinon, was screened for potential new additions. Voucher specimens of the new records are deposited at LG or in the private herbarium of the authors.

Nomenclature follows Grolle & Long (2000) for liverworts (except for a few recent changes listed in Schumacker & Váňa, 2005) and Hill *et al.* (2006) for mosses. The nomenclature of ancient publications was adapted accordingly. In particular, the mentions of *Zygodon viridissimus* (Camus, 1895, 1902, 1903) were interpreted in a modern taxonomic context as *Z. rupestris*. Indeed, *Z. viridissimus* *s.l.* now consists of three species, namely *Z. rupestris*, *Z. stirtonii* and *Z. viridissimus*, but the occurrence of these last two species has never been specifically documented for Corsica. Two additional species mentioned by Camus (1902) were excluded for the same reasons: *Campylophyllum sommerfeltii*, a boreal species, which is very similar to *C. calcareum*, a fairly common species in Corsica; and *Schistidium strictum*, a member of the difficult *S. apocarparum* complex that would need a thorough revision in Corsica before a clear picture of the species that are truly present on the island becomes available.

RESULTS

The Corsican bryoflora: new records and a review of the literature

A total of 481 species, including 131 liverworts, 345 mosses and five hornworts, was reported from Corsica in the literature (Table 2). In the course of the floristic surveys

Table 1. Main vegetation belts in Corsica (nomenclature of Gamisans & Jeanmonod, 1993).

Altitudinal range	Climatic conditions	Vegetation
Coastal fringe <100 m	Thermomediterranean (average temperature of 16°C and pronounced summer drought)	Bushy vegetation (<i>Asparagus albus</i> , <i>Clematis cirrhosa</i> , <i>Euphorbia dendroides</i> and <i>Olea europea</i>)
100–700(900) m	Meso-mediterranean (average annual temperature around 12–16°C and pronounced summer drought)	Evergreen (<i>Quercus ilex</i>) and deciduous (<i>Q. pubescens</i> , <i>Castanea sativa</i>) trees with a shrubby understorey of <i>Arbutus unedo</i> , <i>Erica arborea</i> , <i>E. scoparia</i> , <i>Genista corsica</i> , <i>Cistus</i> spp. and <i>Lavandula stoechas</i> . Maquis shrub vegetation in disturbed areas.
(500)800–1000 (1350) m	Supra-mediterranean (average annual temperature of 10–13°C with a progressively shorter and less intense period drought)	Deciduous broadleaved forest (<i>Quercus petraea</i> , <i>Q. pubescens</i> , <i>Tilia cordata</i> , <i>Populus tremula</i> and <i>Betula pendula</i>) lacking the bushy understorey of thermophilous taxa of the meso-mediterranean level.
1000–1600(1800) m	Mountainous (average annual temperature of 7–10°C with abundant precipitation >1200 mm year ⁻¹)	Beech and fir forests on cold, north-facing slopes and <i>Pinus nigra</i> subsp. <i>laricio</i> forests on south-facing slopes.
>1600(1800)–2100 m	Sub-alpine (average annual temperature around 3–7°C)	Shrubby vegetation of <i>Juniperus nana</i> (north-facing slopes) and <i>Alnus alnobetula</i> subsp. <i>odorata</i> (south-facing slopes)
>2100 m		Grassy, alpine vegetation

Table 2. Check-list of Corsican bryophytes. 1 = this paper; 2 = Schumacker & Vána (2005); 3 = Bischler & Jovet-Ast (1973); 4 = Düll (1983, 1984, 1985); 5 = Greven (1995); 6 = Hébrard (1974, 1975a, b, 1976, 1977a, b, 1978, 1980, 1981, 1984, 1986, 1988, 1993, 1998, 2000, 2003a, b, 2004, 2005); 7 = Pierrot (1987); 8 = Skrzypczak (2005); 9 = Philibert (1882); 10 = Camus (1895, 1902, 1903); 11 = Sarrassat (1931a, b); 12 = Parriat (1951); 13 = de Litardière & Malcuit (1926) and de Litardière (1909, 1927, 1929); 14 = Frisvoll (1988); 15 = Loiseau & Pierrot (1986); 16 = Geissler (1981); 17 = Gillot (1878a, b); 18 = Blockeel *et al.* (2002, 2006).

Hornworts

Anthoceros punctatus (2,3,4,10)

Phaeoceros laevis (1,2,3,4,10)

Phymatoceros bulbiculosus (1,2,3,4)

Liverworts

Anastrophyllum minutum (1)

Aneura maxima (1)

Aneura pinguis (1,2,3,4,10)

Apometzgeria pubescens (1)

Asterella africana (1,2,3,4,6,8,10)

Athalamia spathysii (1,2,3,4,6)

Barbilophozia barbata (1,2,3,4,10)

Barbilophozia floerkei (2,4,10)

Barbilophozia hatcheri (1,2,3,4)

Barbilophozia lycopodioides (1,2,3,4,10)

Blasia pusilla (6)

Blepharostoma trichophyllum (1,2,3,4,6,10)

Calypogeia arguta (1)

Calypogeia azurea (1,16)

Calypogeia fissa (1,2,3,4,6,10)

Cephalozia bicuspidata (1,2,3,4,6,10)

Cephalozia connivens (1,2,4,11)

Cephalozia humulifolia (1,2,3,4,6,10)

Cephaloziella baumgartneri (2,3,4)

Cephaloziella calyculata (2,3,4)

Cephaloziella divaricata (1,2,3,4,6,10)

Cephaloziella divaricata var. *scabra* (1,3)

Cephaloziella massalongi (2,3,4)

Cephaloziella rubella (1,6)

Cephaloziella stellulifera (1,2,3,4)

Cephaloziella turneri (1,2,3,4,10)

Chiloscyphus pallescens (3,4,6)

Chiloscyphus polyanthos (1,2,3,4,10)

Cololejeunea rossettiana (1,2,3,4,8)

Conocephalum conicum s.l. (1,2,3,4,6,8,10)

Corsinia coriandrina (1,2,3,4,6,10,15)

Diplophyllum albicans (1,2,3,4,10)

Diplophyllum taxifolium (1,2,3,4,10)

Douinia ovata (1)

Fossombronia angulosa (1,2,3,4,6,10)

Fossombronia caespitiformis (1,2,3,4,15)

Fossombronia echinata (2,3,4)

Fossombronia foveolata (16)

Fossombronia husnotii (1)

Fossombronia pusilla (1,2,3,4,10,15)

Fossombronia wondraczekii (1)

Frullania dilatata (1,2,3,4,6,10)

Frullania fragilifolia (1,2,3,4,10)

Frullania tamarisci (1,2,3,4,6,10)

Gongylanthus ericetorum (1,2,3,4,6,10,15)

Gymnocolea inflata (2,3,10)

Harpalejeunea mollerii (1,2,3,4,10)

Jubula hutchinsiae (1)

Jungermannia atrovirens (1,2,3,4,10)

Jungermannia exsertifolia subsp. *cordifolia* (1)

Jungermannia gracillima (1,2,3,4)

Jungermannia leiantha (1)

Table 2. (Continued).

Jungermannia obovata (16)

Jungermannia pumila (1,2,3,4,10)

Leiocolea collaris (2,3,4,10)

Leiocolea turbinata (1,2,3,4)

Lejeunea cavifolia (1,2,3,4,6,10,11)

Lejeunea lamacerina (1,8)

Lepidozia reptans (1,2,3,4,6,10)

Lophocolea bidentata (incl. var. *cuspidata*) (1,2,3,4,6,10)

Lophocolea fragrans (1,2,3,4,8,10,16)

Lophocolea heterophylla (1,2,3,4)

Lophocolea minor (2,3,4)

Lophozia bicrenata (1,2,3,4,10)

Lophozia excisa (16)

Lophozia longidens (1)

Lophozia longiflora (16)

Lophozia obtusa (2,3,4)

Lophozia sudetica (1,2,3,4,10)

Lophozia ventricosa (1,2,3,4,6,10)

Lumularia cruciata (1,2,3,4,6,10)

Mannia androgyna (1,2,3,4,6,10)

Marchantia paleacea (2,3,4,6)

Marchantia polymorpha s.l. (1,2,3,4)

Marchesinia mackaii (8)

Marsupella emarginata (1,2,3,4,10,16)

Marsupella funckii (1,2,3,4,6,10,15)

Marsupella sphacelata (2,3,4,10)

Metzgeria furcata (1,2,3,4,8,10)

Microlejeunea ulicina (2,3,4)

Nardia compressa (1,2,3,4,10,16)

Nardia geoscyphus (1)

Nardia scalaris (1,2,3,4,10)

Nowellia curvifolia (1,2,3,4,10)

Odontoschisma sphagni (1)

Oxymitra incrassata (1,2,3,4,6,10,11,15)

Pedinophyllum interruptum (2,3,4,10)

Pellia endiviifolia (1,2,3,4,10)

Pellia epiphylla (1,2,3,4,10)

Plagiochasma rupestre (1,2,3,4,10)

Plagiochila asplenioides (1,2,3,4)

Porella arboris-vitae (1,2,3,4,6,10,13)

Porella cordaeana (1,2,3,4,10)

Porella obtusata (1,2,3,4,6,10)

Porella platyphylla (1,2,3,4,8,10)

Preissia quadrata (1,2,3,4,15)

Ptilidium ciliare (1)

Radula complanata (1,2,3,4,10)

Radula lindenbergiana (1,2,3,4,10)

Reboulia hemisphaerica (1,2,3,4,6,10)

Riccardia chamedryfolia (1,2,3,4,10)

Riccardia latifrons (1,2,3,4,16)

Riccardia multifida (1,2,3,4,6,10)

Riccardia palmata (1,2,3,4,6,10,11)

Riccia beyrichiana (1,2,3,4,15)

Riccia bicarinata (2,3,4)

Riccia canaliculata (1,2,3,4)

Riccia ciliata (1,2,3,4,10)

Riccia ciliifera (1,2,3,4)

Riccia crozalsii (1,2,3,4)

Riccia fluitans (3,4,10)

Riccia glauca (1,2,3,4)

Riccia gougetiana (1,2,3,4,10)

Riccia lamellosa (1,2,3,4,6)

Riccia macrocarpa (1,2,3,4)

Riccia michelii (1,2,3,4,6,10)

Riccia nigrella (1,2,3,4,10)

Riccia papillosa (2)

Table 2. (Continued).

<i>Riccia perennis</i> (2,3,6)
<i>Riccia sorocarpa</i> (1,2,3,4,10)
<i>Riccia subbifurca</i> (2,4)
<i>Riccia trichocarpa</i> (1,2,3,4)
<i>Riccia warnstorffii</i> (2)
<i>Saccogyna viticulosa</i> (1,2,3,4,6,10)
<i>Scapania aspera</i> (2,3,4)
<i>Scapania compacta</i> (1,2,3,4,6,10,16)
<i>Scapania curta</i> (2,3,4)
<i>Scapania gracilis</i> (2,3,4)
<i>Scapania irrigua</i> (1,10,16)
<i>Scapania mucronata</i> (16)
<i>Scapania nemorea</i> (6,16)
<i>Scapania paludosa</i> (1)
<i>Scapania subalpina</i> (2,3,4,13)
<i>Scapania umbrosa</i> (6)
<i>Scapania undulata</i> (1,2,3,4,10,11)
<i>Southbya nigrella</i> (1,2,3,4,10)
<i>Southbya tophacea</i> (1,2,3,4,10)
<i>Sphaerocarpos michelii</i> (2,3,4,10)
<i>Sphaerocarpos texanus</i> (1)
<i>Targionia hypophylla</i> (1,2,3,4,6,10,15)
<i>Targionia lorbeeriana</i> (2)
<i>Trichocolea tomentella</i> (1)
<i>Tritomaria exsecta</i> (2,3,4,10)
<i>Tritomaria exsectiformis</i> (16)
<i>Tritomaria quinquedentata</i> (1,2,3,4,10)

Mosses

<i>Acaulon muticum</i> (1,4)
<i>Acaulon triquetrum</i> (1)
<i>Aloina aloides</i> (1,10)
<i>Aloina ambigua</i> (1,4,10,15)
<i>Amphidium mougeotii</i> (1,4,6,10,16)
<i>Anacolia webbii</i> (1,4,10,11)
<i>Andreaea alpestris</i> (1,4,10)
<i>Andreaea frigida</i> (4,12,16)
<i>Andreaea rothii</i> (1,4,10,11)
<i>Andreaea rupestris</i> (1,6)
<i>Anoetangium aestivum</i> (4)
<i>Anomobryum julaceum</i> (1,4,6,10,11)
<i>Anomodon viticulosus</i> (1,4,10,11)
<i>Antitrichia californica</i> (4,6,10)
<i>Antitrichia curtipendula</i> (1,4,6,10,11,17)
<i>Archidium alternifolium</i> (1,4,6,10,15)
<i>Aschisma carniolicum</i> (1,4)
<i>Atrichum angustatum</i> (4,10)
<i>Atrichum undulatum</i> (1,4,10)
<i>Aulacomnium androgynum</i> (1,4,6,10)
<i>Aulacomnium palustre</i> (1,10,11)
<i>Barbula convoluta</i> (1,4,6,10,15,17)
<i>Barbula unguiculata</i> (1,4,6,10,17)
<i>Bartramia halleriana</i> (1,4,10)
<i>Bartramia ithyphylla</i> (1,4,10,11,12)
<i>Bartramia pomiformis</i> (1,4,6,10,17)
<i>Bartramia stricta</i> (1,4,6,10,17)
<i>Blindia acuta</i> (1,4,10)
<i>Brachytheciastrum collinum</i> (6)
<i>Brachytheciastrum olympicum</i> (1,4,10)
<i>Brachytheciastrum velutinum</i> (1,4,6,10)
<i>Brachythecium albicans</i> (1,4,6,10)
<i>Brachythecium rivulare</i> (1,4,10,11,13)
<i>Brachythecium rutabulum</i> (1,4,6,10,17)
<i>Brachythecium salebrosum</i> (1,6)
<i>Brachythecium tommasinii</i> (6)
<i>Breutelia chrysocoma</i> (1,4,6,10,16)

Table 2. (Continued).

<i>Bryum algovicum</i> (15?)
<i>Bryum alpinum</i> (1,4,6,10,17)
<i>Bryum argenteum</i> (1,4,10)
<i>Bryum caespiticium</i> (1,4,10,17)
<i>Bryum canariense</i> (4,10)
<i>Bryum capillare</i> (1,4,6,10,17)
<i>Bryum creberrimum</i> (12)
<i>Bryum dichotomum</i> (1,10,15)
<i>Bryum donianum</i> (1,4,8,10)
<i>Bryum elegans</i> (1,12)
<i>Bryum gemmiparum</i> (1,4,10)
<i>Bryum kunzei</i> (1)
<i>Bryum mildeanum</i> (10)
<i>Bryum muehlenbeckii</i> (1,4,6,10,12)
<i>Bryum pallens</i> (1,13)
<i>Bryum pallescens</i> (4,6,10,12)
<i>Bryum pseudotriquetrum</i> (1,4,10)
<i>Bryum radiculosum</i> (1,10,15)
<i>Bryum rubens</i> (4,6)
<i>Bryum subapiculatum</i> (1,4,6,10)
<i>Bryum torquescens</i> (1,4,10,15,17)
<i>Buxbaumia viridis</i> (1,4,6,10)
<i>Calliergonella cuspidata</i> (1,4,6,10)
<i>Campyliadelphus chrysophyllus</i> (1,4)
<i>Campyliadelphus elodes</i> (4)
<i>Campylium protensum</i> (4,10)
<i>Campylium stellatum</i> (1,10,11)
<i>Campylophyllum calcareum</i> (4,10)
<i>Campylopus brevipilus</i> (1,4,6,10)
<i>Campylopus fragilis</i> (1,4,10)
<i>Campylopus gracilis</i> (1)
<i>Campylopus oerstedianus</i> (1,4)
<i>Campylopus pilifer</i> (1,4,6,10)
<i>Campylostelium strictum</i> (4,10)
<i>Ceratodon conicus</i> (4,10,15)
<i>Ceratodon purpureus</i> (1,4,6,10,12,15)
<i>Cheilothea chloropus</i> (1,4,6,10,15)
<i>Cinclidotus fontinaloides</i> (1,4,6,10)
<i>Cirriphyllum crassinervium</i> (1,4,8,10,11)
<i>Claopodium whippleanum</i> (4)
<i>Climacium dendroides</i> (1)
<i>Conardia compacta</i> (4)
<i>Coscinodon cribrosus</i> (1,5)
<i>Cratoneuron curvicaule</i> (4)
<i>Cratoneuron filicinum</i> (1,10)
<i>Crossidium squamiferum</i> (1,4,6,10)
<i>Cryphaea heteromalla</i> (1)
<i>Ctenidium molluscum</i> (1,4,10,11)
<i>Cynodontium bruntonii</i> (1,4,6,10)
<i>Cynodontium polycarpon</i> (1)
<i>Dialytrichia mucronata</i> (1,4,6,10)
<i>Dichodontium palustre</i> (1,4,6)
<i>Dichodontium pellucidum</i> (1,4,6,10,13)
<i>Dicranella heteromalla</i> (1,4,10)
<i>Dicranella howei</i> (4)
<i>Dicranella rufescens</i> (1)
<i>Dicranella varia</i> (1,4,10)
<i>Dicranoweisia cirrata</i> (1,4,6,10)
<i>Dicranoweisia crispula</i> (1,4,10,12)
<i>Dicranum bonjeanii</i> (1)
<i>Dicranum montanum</i> (6)
<i>Dicranum scoparium</i> (1,4,6,10)
<i>Dicranum spadiceum</i> (1)
<i>Dicranum tauricum</i> (1,4,6,10,11)
<i>Didymodon acutus</i> (4,10,15)
<i>Didymodon fallax</i> (1,4,10)

Table 2. (Continued).

<i>Didymodon insulanus</i> (1,4,6,10)
<i>Didymodon luridus</i> (1,4,10,15,17)
<i>Didymodon sinuosus</i> (1)
<i>Didymodon spadiceus</i> (1,4,10)
<i>Didymodon tophaceus</i> (1,4,6,10)
<i>Didymodon vinealis</i> (1,4,6,10)
<i>Diphyscium foliosum</i> (1,4,10)
<i>Ditrichum heteromallum</i> (4,10)
<i>Ditrichum pallidum</i> (10)
<i>Ditrichum subulatum</i> (1,4,10)
<i>Drepanocladus aduncus</i> (1,4,6)
<i>Encalypta ciliata</i> (4,10)
<i>Encalypta streptocarpa</i> (1,4,10)
<i>Encalypta vulgaris</i> (1,4,6,10,17)
<i>Entosthodon convexus</i> (1,4,6,10)
<i>Entosthodon attenuatus</i> (1,4,6,10)
<i>Entosthodon durieui</i> (18)
<i>Entosthodon fascicularis</i> (4,10)
<i>Entosthodon muhlenbergii</i> (17)
<i>Entosthodon obtusus</i> (1,4,6,10,15)
<i>Entosthodon pulchellus</i> (1,4,6)
<i>Ephemerum serratum</i> (4)
<i>Ephemerum sessile</i> (1,4,10,15)
<i>Epipterygium tozeri</i> (1,4,6,10)
<i>Eucladium verticillatum</i> (1,4,8,10)
<i>Eurhynchiastrum pulchellum</i> (6)
<i>Eurhynchiastrum pulchellum</i> var. <i>diversifolium</i> (4)
<i>Eurhynchium striatum</i> (1,6,10)
<i>Fabronia pusilla</i> (1,4,6,10)
<i>Fissidens adianthoides</i> (1,4,10)
<i>Fissidens bryoides</i> (1,10)
<i>Fissidens bryoides</i> var. <i>caespitans</i> (1)
<i>Fissidens crassipes</i> (4,6)
<i>Fissidens crispus</i> (1)
<i>Fissidens curvatus</i> (1)
<i>Fissidens dubius</i> (1,4,10)
<i>Fissidens osmundoides</i> (13)
<i>Fissidens ovatifolius</i> (1,4,6,8)
<i>Fissidens pusillus</i> (10)
<i>Fissidens rivularis</i> (1)
<i>Fissidens serrulatus</i> (1,4,6,10)
<i>Fissidens taxifolius</i> (1,4,6,8,10)
<i>Fissidens viridulus</i> (1,4)
<i>Fissidens viridulus</i> var. <i>incurvus</i> (1,4,10)
<i>Fontinalis antipyretica</i> (1,4,8,10,11)
<i>Fontinalis hypnoides</i> var. <i>duriaei</i> (1,4)
<i>Fontinalis squamosa</i> (1,4,6,10,16)
<i>Funaria hygrometrica</i> (1,4,10,15,17)
<i>Funariella curviseta</i> (1,4,6,10)
<i>Grimmia alpestris</i> (1,4,5,12)
<i>Grimmia anomala</i> (1,4,5,6)
<i>Grimmia caespiticia</i> (1,4,5)
<i>Grimmia decipiens</i> (1,4,5,6,10)
<i>Grimmia elatior</i> (6)
<i>Grimmia funalis</i> (1,4,5,6,10)
<i>Grimmia hartmanii</i> (1,4,5,10)
<i>Grimmia laevigata</i> (1,4,5,6,10)
<i>Grimmia lisae</i> (1,5,8)
<i>Grimmia longirostris</i> (5)
<i>Grimmia montana</i> (1,5,6)
<i>Grimmia muehlenbeckii</i> (5)
<i>Grimmia orbicularis</i> (4,5,6)
<i>Grimmia ovalis</i> (1,4,5,10)
<i>Grimmia pulvinata</i> (1,4,5,10,17)
<i>Grimmia ramondii</i> (1,4,5,6,10,11)
<i>Grimmia reflexidens</i> (1,5,6)

Table 2. (Continued).

<i>Grimmia tergestina</i> (1,4,5)
<i>Grimmia torquata</i> (1,4,5,10,11,12)
<i>Grimmia trichophylla</i> (1,4,5,6,10,11)
<i>Grimmia unicolor</i> (1,4,5,10,12)
<i>Gymnostomum aeruginosum</i> (1)
<i>Gymnostomum calcareum</i> (1,4,6,10)
<i>Gymnostomum viridulum</i> (1,6)
<i>Habrodon perpusillus</i> (1,4,6,10,17)
<i>Hedwigia ciliata</i> (1,4,6,10)
<i>Hedwigia stellata</i> (1)
<i>Herzogiella seligeri</i> (1,4,6,10)
<i>Heterocladium dimorphum</i> (1,4,10,11,12)
<i>Heterocladium flaccidum</i> (1)
<i>Heterocladium heteropterum</i> (1,4,10)
<i>Homalia lusitanica</i> (1,10)
<i>Homalothecium aureum</i> (1,4,10,11)
<i>Homalothecium philippeanum</i> (4,10)
<i>Homalothecium sericeum</i> (1,4,6,8,10,17)
<i>Hookeria lucens</i> (1,4,10)
<i>Hygroamblystegium varium</i> (6)
<i>Hygrohypnum duriusculum</i> (1,4,11)
<i>Hygrohypnum eugyrium</i> (10)
<i>Hygrohypnum luridum</i> (1)
<i>Hygrohypnum molle</i> (6,12)
<i>Hygrohypnum ochraceum</i> (4,16)
<i>Hylocomium splendens</i> (1,10)
<i>Hymenostylium recurvirostrum</i> (4)
<i>Hyocomium armoricum</i> (10)
<i>Hypnum cupressiforme</i> (1,4,6,8,10)
<i>Hypnum hamulosum</i> (10)
<i>Isopterygiopsis pulchella</i> (1)
<i>Isothecium alopecuroides</i> (1,4,6,10)
<i>Isothecium myosuroides</i> (1,4,6,10)
<i>Kiaeria starkei</i> (1,4)
<i>Kindbergia praelonga</i> (1,4,6,8,10,11,13)
<i>Leptobryum pyriforme</i> (10)
<i>Leptodictyum riparium</i> (1,10)
<i>Leptodon smithii</i> (1,4,10,15,17)
<i>Leucobryum glaucum</i> (1,10)
<i>Leucodon sciurooides</i> (1,4,10)
<i>Loeskeobryum brevirostre</i> (1)
<i>Microbryum davallianum</i> (1,4,6,10)
<i>Microbryum floerkeanum</i> (6)
<i>Microbryum rectum</i> (1,10,15)
<i>Microbryum starkeanum</i> (1,4,10,15)
<i>Mnium hornum</i> (1,4,10)
<i>Mnium marginatum</i> (1)
<i>Mnium spinosum</i> (1)
<i>Mnium spinulosum</i> (1)
<i>Mnium stellare</i> (1,4,10)
<i>Neckera bessi</i> (4)
<i>Neckera complanata</i> (1,4,10)
<i>Neckera crispa</i> (1,4,6,8,10,17)
<i>Neckera menziesii</i> (1)
<i>Neckera pumila</i> (1,4,10,11)
<i>Orthotrichum acuminatum</i> (1,4)
<i>Orthotrichum affine</i> (1)
<i>Orthotrichum anomalum</i> (1,10)
<i>Orthotrichum consimile</i> (4)
<i>Orthotrichum cupulatum</i> (1,10)
<i>Orthotrichum cupulatum</i> var. <i>riparium</i> (1)
<i>Orthotrichum diaphanum</i> (1,4,10)
<i>Orthotrichum ibericum</i> (1)
<i>Orthotrichum lyellii</i> (1,4,10)
<i>Orthotrichum macrocephalum</i> (1, 18)
<i>Orthotrichum pallens</i> (1)

Table 2. (Continued).

<i>Orthotrichum pumilum</i> (1)
<i>Orthotrichum rupestre</i> (1,4,10,17)
<i>Orthotrichum scanicum</i> (1)
<i>Orthotrichum schimperi</i> (1)
<i>Orthotrichum shawii</i> (1,9)
<i>Orthotrichum stramineum</i> (1,4,10,11)
<i>Orthotrichum striatum</i> (1,4,10)
<i>Orthotrichum tenellum</i> (1,4,10)
<i>Orthotrichum urnigerum</i> (4,6)
<i>Oxyrrhynchium hians</i> (1,4,6,8,10)
<i>Oxyrrhynchium pumilum</i> (1,4,8,10)
<i>Oxyrrhynchium schleicheri</i> (1,4,10)
<i>Oxyrrhynchium speciosum</i> (10)
<i>Oxystegus tenuirostris</i> (10)
<i>Palustriella commutata</i> (1,4,10,11,17)
<i>Paraleucobryum longifolium</i> (1,4,10)
<i>Phascum cuspidatum</i> (1,4,10)
<i>Philonotis arnellii</i> (1,4,6,10)
<i>Philonotis calcarea</i> (4,10)
<i>Philonotis fontana</i> (1,10,13,17)
<i>Philonotis marchica</i> (1,10)
<i>Philonotis rigida</i> (4,10)
<i>Philonotis seriata</i> (1,4,6,11,12)
<i>Philonotis tomentella</i> (1,4)
<i>Physcomitrium pyriforme</i> (4)
<i>Plagiomnium affine</i> (1,4,10)
<i>Plagiomnium cuspidatum</i> (4,6)
<i>Plagiomnium undulatum</i> (1,4,8,10,13,17)
<i>Plagiopus oederianus</i> (1)
<i>Plagiothecium cavifolium</i> (1)
<i>Plagiothecium curvifolium</i> (6)
<i>Plagiothecium denticulatum</i> (1,4,10)
<i>Plagiothecium nemorale</i> (1,6)
<i>Plagiothecium piliferum</i> (1,4,10)
<i>Plagiothecium platyphyllum</i> (1,4,6)
<i>Plagiothecium succulentum</i> (1)
<i>Plasturhynchium meridionale</i> (1,10)
<i>Platyhypnidium lusitanicum</i> (1)
<i>Platyhypnidium riparioides</i> (1,4,6,8,10)
<i>Pleuridium acuminatum</i> (1,4,10,15)
<i>Pleuridium subulatum</i> (4)
<i>Pleurochaete squarrosa</i> (1,4,6,10,11,15)
<i>Pogonatum aloides</i> (1,4,10,17)
<i>Pogonatum nanum</i> (10)
<i>Pogonatum urnigerum</i> (1,4,10)
<i>Pohlia annotina</i> (1,4,10)
<i>Pohlia cruda</i> (1,10,11)
<i>Pohlia drummondii</i> (4,12)
<i>Pohlia elongata</i> (1,4,6)
<i>Pohlia lescuriana</i> (1)
<i>Pohlia longicolla</i> (1)
<i>Pohlia melanodon</i> (1,4,10)
<i>Pohlia nutans</i> (1,4,6,10,17)
<i>Pohlia prolifera</i> (1)
<i>Pohlia wahlenbergii</i> (1,4,6)
<i>Polytrichastrum alpinum</i> (1,4,10,12,17)
<i>Polytrichastrum formosum</i> (1,4,6,10,11)
<i>Polytrichum commune</i> (1,4,6,10)
<i>Polytrichum juniperinum</i> (1,4,6,10)
<i>Polytrichum piliferum</i> (1,4,10)
<i>Polytrichum strictum</i> (10)
<i>Pseudocrossidium hornschuchianum</i> (1,4,6,10,15)
<i>Pseudocrossidium revolutum</i> (1,4,10)
<i>Pseudoleskea incurvata</i> (1,4,10,11)
<i>Pseudoleskea patens</i> (1,4,12)
<i>Pseudoleskea saviana</i> (1,7)

Table 2. (Continued).

<i>Pseudoscleropodium purum</i> (1,4,6,10)
<i>Pseudotaxiphyllum elegans</i> (1,4,6,10)
<i>Pterigynandrum filiforme</i> (1,4,6,10,17)
<i>Pterogonium gracile</i> (1,4,6,10,15,17)
<i>Ptychomitrium polyphyllum</i> (1,4,10)
<i>Racomitrium aciculare</i> (1,4,6,10,11)
<i>Racomitrium affine</i> (1,4,14)
<i>Racomitrium aquaticum</i> (4,6,10)
<i>Racomitrium elongatum</i> (1,4,6)
<i>Racomitrium heterostichum</i> (1,4,6,10,14)
<i>Racomitrium lanuginosum</i> (1,4,6,10)
<i>Racomitrium macounii</i> subsp. <i>alpinum</i> (1,14)
<i>Racomitrium macounii</i> subsp. <i>macounii</i> (14)
<i>Racomitrium sudeticum</i> (10,12,14)
<i>Rhabdoweisia fugax</i> (10)
<i>Rhizomnium magnifolium</i> (10)
<i>Rhizomnium punctatum</i> (1,4,6,8,10)
<i>Rhynchostegiella curviseta</i> (1,4,10)
<i>Rhynchostegiella durieui</i> (4)
<i>Rhynchostegiella litorea</i> (1,4,10)
<i>Rhynchostegiella tenella</i> (1,4,8,10)
<i>Rhynchostegiella teneriffae</i> (1,6,8,10)
<i>Rhynchostegium confertum</i> (1,4,6,10)
<i>Rhynchostegium megapolitanum</i> (1,4,10,15)
<i>Rhytidiadelphus loreus</i> (1,4,10)
<i>Rhytidiadelphus triquetrus</i> (1,4,10)
<i>Sanionia uncinata</i> (1,4,10)
<i>Schistidium agassizii</i> (1,4,6,7)
<i>Schistidium apocarpum</i> s.l. (1,4,6,10,17)
<i>Schistidium confertum</i> (4,6,10,12,17)
<i>Schistidium rivulare</i> (1,4,10)
<i>Sciuro-hypnum glaciale</i> (12)
<i>Sciuro-hypnum plumosum</i> (1,4,10)
<i>Sciuro-hypnum populeum</i> (1,4,10)
<i>Sciuro-hypnum reflexum</i> (4,10)
<i>Scleropodium cespitosum</i> (4,10)
<i>Scleropodium touretii</i> (1,4,6,10,11,15)
<i>Scorpiurium circinatum</i> (1,4,6,8,10)
<i>Scorpiurium deflexifolium</i> (1,4,6)
<i>Sematophyllum substrumulosum</i> (1,4)
<i>Sphagnum auriculatum</i> (1,4,6,10,11)
<i>Sphagnum capillifolium</i> (1,4,6,10)
<i>Sphagnum centrale</i> (4)
<i>Sphagnum compactum</i> (4,10,16)
<i>Sphagnum girgensohnii</i> (1,13)
<i>Sphagnum magellanicum</i> (4)
<i>Sphagnum palustre</i> (1,4,6,11)
<i>Sphagnum russowii</i> (1)
<i>Sphagnum squarrosum</i> (1,10)
<i>Sphagnum subnitens</i> (1,4,6,10,11)
<i>Sphagnum subsecundum</i> (1,10)
<i>Sphagnum tenellum</i> (1)
<i>Sphagnum teres</i> (1)
<i>Straminergon stramineum</i> (1,4,6)
<i>Syntrichia laevipila</i> (1,4,10,17)
<i>Syntrichia montana</i> (1,4,6,10,15)
<i>Syntrichia norvegica</i> (1,4,12)
<i>Syntrichia papillosa</i> (1,4,10)
<i>Syntrichia princeps</i> (1,4,6,10,17)
<i>Syntrichia ruralis</i> (1,4,10,17)
<i>Tetraphis pellucida</i> (4,10)
<i>Thamnobryum alopecurum</i> (1,4,6,8,10)
<i>Thuidium tamariscinum</i> (1,4,10)
<i>Timmia norvegica</i> (4,16)
<i>Timmiaella barbuloidea</i> (1,4,6)
<i>Tortella flavovirens</i> (1,4,10,15)

that we have undertaken in Corsica over 20 years, 421 species (108 liverworts, two hornworts and 310 mosses) were recorded. Among those species, 17 liverwort and 44 moss species are reported here as new to Corsica. Details concerning the locality and habitat conditions of the new records are listed below.

Liverworts

Anastrophyllum minutum. 2B, Ghisoni, along the long-distance trail (GR20) at 1740 m between the Verde pass and Punta del Prato, UTM NM1851, 28.05.2004. Siliceous rocks with *Heterocladium dimorphum*, *Barbilophozia hatcheri*, *Metzgeria furcata* and *Plagiochila porelloides* (herb. Sotiaux, *Sotiaux 2004/515*).

Aneura maxima. 2B, Ghisoni state forest, Alzitone gully at 1030 m, UTM NM1462, 23.05.2004. On ground of a very wet rock cave near the stream, with *Riccardia multifida* and *Lophocolea fragrans*. Also spring area at 1105 m (herb. Sotiaux, *Sotiaux 2004/420* and *424*).

Apometzgeria pubescens. 2B, Carticasi, Malerso gully at 800 m, UTM NM2488, 14.07.2005 (herb. A. Pioli, *Pioli 005.07.08/11*; herb. Royaud, *Royaud F2B/202-1*).

Calypogeia arguta. 2B, Bonifatu forest, along the long-distance trail (GR20) at 575 m, UTM MM89, 08.07.1985. On ground with *Calypogeia fissa*, *Pellia epiphylla*, *Fissidens taxifolius* and *Pogonatum aloides* (herb. Sotiaux, *Sotiaux 4381*).

Douinia ovata. 2B, Tartagine-Melaja state forest at 750 m, UTM MN90, 09.07.1985; Valdu Niellu forest

Table 2. (Continued).

<i>Tortella nitida</i> (1,4,8,10,11)
<i>Tortella tortuosa</i> (1,4,10)
<i>Tortula atrovirens</i> (1,4,6,10)
<i>Tortula brevissima</i> (1)
<i>Tortula canescens</i> (1,4,6,10,15)
<i>Tortula cuneifolia</i> (1,4,6,10)
<i>Tortula hoppeana</i> (4,6)
<i>Tortula inermis</i> (1,4,10,15)
<i>Tortula lanceola</i> (4,10)
<i>Tortula marginata</i> (1,4)
<i>Tortula modica</i> (1,4,10)
<i>Tortula muralis</i> (1,4,6,10,15,17)
<i>Tortula pallida</i> (4)
<i>Tortula subulata</i> (1,4,10,17)
<i>Tortula truncata</i> (4,10)
<i>Tortula wilsonii</i> (1,4,10)
<i>Trichostomum brachydontium</i> (1,4,6,8,10,15)
<i>Trichostomum crispulum</i> (1,4,6,10,11)
<i>Ulota hutchinsiae</i> (4,10)
<i>Warnstorfia exannulata</i> (1,4,6,10)
<i>Warnstorfia fluitans</i> (1,4,11)
<i>Weissia brachycarpa</i> (1,4,10)
<i>Weissia condensa</i> (1, 10,15)
<i>Weissia controversa</i> (1,4,10,17)
<i>Weissia controversa</i> var. <i>crispata</i> (1,4)
<i>Weissia longifolia</i> (1,6)
<i>Weissia wimmeriana</i> (4,10)
<i>Zygodon rupestris</i> (1,4,10)

between the Papaghja forest house and the Nino lake at 1250 m, UTM MM98, 15.07.1985; Canaglia, Manganello valley at 720 m, UTM NM16, 20.07.1985; Vizzavona, above Cascade des Anglais at 1140 m, UTM NM0962, 20.05.2004. On schist with *Frullania tamarisci*, *F. fragilifolia*, *Scapania compacta*, *Grimmia ramondii*, *G. torquata*, *Plagiothecium piliferum*, *Pterigynandrum filiforme* and *Isothecium myosuroides*; on granite with *Cynodontium polycarpon* (herb. Sotiaux, *Sotiaux 4402, 4538, 4539, 4607, 2004/379*).

Fossombronina husnotii. 2A, San Gavino, on ground along the Vivaggio stream at 200 m, UTM NL0698, 11.05.2003 (herb. Sotiaux, *Sotiaux 2003/118*).

Fossombronina wondraczekii. 2A, Ospedale, Cartalavonu, trail towards Vacca Morta at 1050 m, UTM NM1410, 06.05.2003. On ground along a streamlet with *Bryum alpinum* (herb. Sotiaux, *Sotiaux 2003/47*).

Jubula hutchinsiae. 2A, Levie, Cagna mountain at 1237 m, UTM NM0703, 27.07.2003. Rivulet in a bog with *Erica terminalis* and *Sphagnum* spp. (herb. Pioli, *Pioli 2003.07.26.11*).

Jungermannia exsertifolia subsp. *cordifolia*. 2B, Corte, Tavignano valley at 500 m, UTM NM08, 17.07.1985. Wet rocks along the stream (herb. Sotiaux, *Sotiaux 4572*).

Jungermannia leiantha. 2B, Aitone state forest towards the Vergio pass at 1320 m, UTM MM88, 27.07.1985. Wetland area along a streamlet with *Hookeria lucens*, *Cephalozia lunulifolia*, *Blepharostoma trichophyllum* and *Lepidozia reptans* (herb. Sotiaux, *Sotiaux 4703*); Corte, Cirque d'Orient at 2080 m, UTM NM0474, 08.08.2005. Wetland area along a temporary rivulet (herb. Royaud, *Royaud F2B/269-1*).

Lophozia longidens. 2B, Corte, Restonica gorges at 1200 m, UTM NM07 18.07.1985. Boulders with *Racomitrium lanuginosum*, *Ptilidium ciliare*, *Barbilophozia hatcheri* and *Pterigynandrum filiforme* (herb. Sotiaux, *Sotiaux 4593*).

Nardia geoscyphus. 2B, Nino lake at 1740 m, UTM MM97, 15.07.1985. Wet ground in the pozzines with *Dichodontium palustre* (herb. Sotiaux, *Sotiaux 4555*); 2A, Quenza, Coscione plateau at 1540 m, UTM NM1130, 19.05.2003. On ground of steep banks of streamlets (herb. Sotiaux, *Sotiaux 2003/223*).

Odontoschisma sphagni. 2B, Vivario, Ondaat pozzine at 1600 m, UTM NM0665, 20.07.2005. Pozzine with *Trichoporum cespitosum* and *Sphagnum* spp. along the rivulet (herb. Royaud, *Royaud F2B/219b-1*).

Ptilidium ciliare. 2B, Corte, Restonica gorges at 1200 m, UTM NM07, 18.07.1985. Boulders with *Racomitrium lanuginosum*, *Pterigynandrum filiforme* and *Paraleucobryum longifolium* (herb. Sotiaux, *Sotiaux 4586*).

Scapania paludosa. 2A, Bocognano, pozzine East of Pozzolo at 1870 m, UTM NM0854, 31.07.2005 (herb. Royaud, *Royaud F2A/147-1*).

Sphaerocarpos texanus. 2B, towards the Ostriconi beach at 10 m, UTM NN0523, 30.04.1986. On ground along the Ostriconi river with *Barbula unguiculata*, *Phascum cuspidatum* and *Bryum caespiticium* (herb. Sotiaux, *Sotiaux 5206*).

Trichocolea tomentella. 2B, Vivario, Acqua Bollita at 1120 m, UTM NM1062, 04.05.2003. Seepage area with *Gentiana asclepiadea* and *Carex microcarpa* (herb. Pioli, *Pioli 2003.05.04/16*); Ghisoni, tributary of the Forno river at 1050 m, UTM NM0156, 13.04.2004. Same habitat (herb. Pioli, *Pioli 2004.04*); Vizzavona, Agnone at 995 m, UTM NM6404, 28.03.2006. Seepage area on a steep slope under beech forest, with *Aneura pinguis*, *Pellia epiphylla* and *Plagiomnium undulatum* (herb. Pioli, *Pioli 2006.03.28/10*).

Mosses

Acaulon triquetrum. 2B, Ponte Leccia, on roadside slope at ca 200 m, UTM NN10, 16.02.1980 (LG, *De Sloover 31344*).

Bryum gemmilucens. 2B, Balagne area along the D963 between Olmi-Capella and Belgodère at 775 m, UTM NN0312, 03.05.1986. On rocky roadside with *Tortula brevissima* and *Cephaloziella* sp. (herb. Sotiaux, *Sotiaux 5300*). Also mentioned by Demaret (1993), but without any date and locality. The BR and LG herbaria indeed yield the collection *J. Lambinon n° 79/Col270 et F. Pironet* from 2B, Calvi, Revellata, Alga beach, 06.05.1979, at sea level, UTM MN71, on granite within a *Cistus*-dominated bushy vegetation.

Bryum kunzei. 2B, Agriates desert towards Bocca di Vezzu. Alt. 310 m, UTM NN1214, 27.04.1986. Gravelly soil at the border of the bush (herb. Sotiaux, *Sotiaux 5140*, ! David Holyoak).

Campylopus gracilis. 2B, Venaco, valley of the Verjello stream at 1000 m, UTM NM0871, 03.05.1987. On siliceous rocks near the stream (herb. Sotiaux, *Sotiaux 6485*).

Climacium dendroides. 2A, Quenza, Coscione Plateau near the ski station at 1540 m, UTM NM1130, 19.05.2003. In the pozzines (herb. Sotiaux, *Sotiaux 2003/219*).

Cryphaea heteromalla. 2B, Bardiana, Fango valley at 200 m, UTM MM8390, 04.05.1986; Epiphytic on *Phillyrea* outside of the village, with *Frullania dilatata*, *Leptodon smithii* and *Orthotrichum lyelli* (herb. Sotiaux, *Sotiaux 5320*).

Cynodontium polycarpon. 2A, Ospedale, between the Foce Alta pass and Punta de la Vacca Morta, UTM NM1311, 06.05.2003. Siliceous rocks along the path at 1150 m (herb. Sotiaux, *Sotiaux 2003/159*); 2B, Vizzavona, above Cascade des Anglais at 1140 m, UTM NM0962, 20.05.2004. On rocks along the stream with *Douinia ovata* (herb. Sotiaux, *Sotiaux 2004/379*).

Dicranella rufescens. 2B, Aitone state forest towards the Vergio pass at 1320 m, UTM MM88, 27.07.1985. Pioneer vegetation at the base of a wet slope along road D84 (herb. Sotiaux, *Sotiaux 4720*).

Dicranum bonjeanii. 2B, Verde pass above the Pozzi sheepfold at 1780 m, UTM NM1153, 25.05.2004. Around wet ground (herb. Sotiaux, *Sotiaux 2004/462*).

Dicranum spadiceum. 2A, Bavella pass at 1590 m, UTM NM1827, 12.05.2003. Siliceous rocks with *Tritomaria quinquentata* (herb. Sotiaux, *Sotiaux 2003/135*, ! L.

Hedenäs); 2B, Ghisoni, between the Verde pass and Punta del Prato along the long-distance trail (GR20) at 1740 m, UTM NM1851, 28.05.2004; subalpine grassland at the foot of rock outcrops (herb. Sotiaux, *Sotiaux 2004/516*, ! L. Hedenäs).

Didymodon sinuosus. 2B, Santo-Pietro-di-Tenda at 280 m, UTM NN21, 13.07.1985. Boulder along a temporary stream (herb. Sotiaux, *Sotiaux 4467*).

Fissidens bryoides var. *caespitans*. 2B, Bonifatu forest at 575 m, UTM MM89, 08.07.1985. On ground along a temporary stream (herb. Sotiaux, *Sotiaux 4397*, ! M. A. Bruggeman-Nannenga).

Fissidens crispus. 2B, Cap Corse, Barrettali at 40 m, UTM NN24, 14.07.1985. On ground under *Quercus ilex* (herb. Sotiaux, *Sotiaux 4513*, ! M. A. Bruggeman-Nannenga); Cap Corse, Centuri harbour at 100 m, UTM NN25, 14.07.1985. On ground on a rocky slope with *Rhynchostegium confertum* (herb. Sotiaux, *Sotiaux 4525*, ! M. A. Bruggeman-Nannenga); Cap Corse, Minerbio at 150 m, UTM NN24, 14.07.1985. On ground of a roadside slope with *Tortula wilsonii* and *Didymodon vinealis* (herb. Sotiaux, *Sotiaux 4517*, ! M. A. Bruggeman-Nannenga).

Fissidens curvatus. 2B, Calvi, La Revellata at about 20 m, UTM MN71, 04.05.1979. On bare soil within a dense shrub vegetation of *Olea sylvestris*, *Phillyrea* and *Pistacia lentiscus* along the coast (LG, *Lambinon 79/col228*); Olmeta di Capo Corso, between Celle and Sant' Erasmo chapel at about 350 m, UTM NN3036, 01.05.1986. On ground with *Fossombronina angulosa*, *Fissidens ovatifolius* and *F. taxifolius* (herb. Sotiaux, *Sotiaux 5233*, 5237).

Fissidens rivularis. 2B, Cap Corse, Pietracorbara, UTM NN34, 09.2006. Splash zone by forest stream with *Rhynchostegiella teneriffae* and *Platyhypnidium riparioides*; Sisco, UTM NN34, 09.2006. Same habitat (LG, *Vanderpoorten 445* and *659*, ! M. A. Bruggeman-Nannenga); Santo-Pietro-di-Tenda at 320 m, UTM NN21, 13.07.1985. Wet rocks along a stream (herb. Sotiaux, *Sotiaux 4484*, det. M. A. Bruggeman-Nannenga).

Gymnostomum aeruginosum. 2B, Asco, valley of the Pinara stream at 850 m, UTM NM0297, 29.04.1987. Rock cave (herb. Sotiaux, *Sotiaux 6387*).

Hedwigia stellata. Many localities in both departments.

Heterocladium flaccidum. 2B, Canaglia, valley of the Manganello stream at 850 m, UTM NM0968, 02.05.1987. (herb. Sotiaux, *Sotiaux 6458*).

Hygrohypnum luridum. 2A, Bavella, Volpajola ravine at 1010 m, UTM NM1926, 14.05.2003. Rocks in the river bed (herb. Sotiaux, *Sotiaux 2003/159*); 2B, Arcarota pass at 680 m, UTM NM38, 09.2006. On rocks in a woody ravine with *Palustriella commutata* within the chestnut forest belt (LG, *Vanderpoorten 484*); Piedicroce, 480 m, UTM NM39, 09.2006. On asphalt along the road, within the chestnut forest belt (LG, *Vanderpoorten 448* and *507*); Canaglia, Manganello valley at 720 m, UTM NM16, 20.07.1985. Wet rocks near a waterfall with *Racomitrium aciculare* and *Didymodon spadiceus* (herb. Sotiaux, *Sotiaux 4606*).

Hypnum cupressiforme var. *resupinatum*. 2B, Corte, Restonica gorges at 1200 m, UTM NM07, 18.07.1985. Boulders with *Racomitrium lanuginosum* (herb. Sotiaux, *Sotiaux* 4589).

Isopterygiopsis pulchella. 2A, Ospedale, between the Foce Alta pass and Punta de la Vacca Morta at 1150 m, UTM NM1311, 06.05.2003. Siliceous rocks (herb. Sotiaux, *Sotiaux* 2003/160).

Loeskeobryum brevirostre. 2B, Piedicroce area at 400 m, UTM 3193, 07.05.1988. In the Andegno valley (Herb. Sotiaux, *Sotiaux* s.n.).

Mnium marginatum. 2B, Vizzavona, 1205 m, UTM NM0962, 20.05.2004. Walls of an ancient castle (herb. Sotiaux, *Sotiaux* 2004/392).

Mnium spinosum. 2B, Tartagine-Melaja forest, near the forest house at 750 m, UTM MN90, 09.07.1985. On ground nearby the stream, with *Riccia beyrichiana* (herb. Sotiaux, *Sotiaux* 4408).

Mnium spinulosum. 2B, Corte, Restonica gorges at 1200 m, UTM NM07, 18.07.1985. Boulders with *Racomitrium lanuginosum* (herb. Sotiaux, *Sotiaux* 4587).

Neckera menziesii. 2B, Tartagine-Melaja forest at 950 m, UTM MN90, 28.07.1985. Micro-caves in schist rocks (herb. Sotiaux, *Sotiaux* 4691).

Orthotrichum affine. Epiphytic in many localities in both departments and obviously overlooked.

Orthotrichum ibericum. 2A, Quenza, Jallicu, along the path Mare à Mare Sud at 1000 m, UTM NM0925, 22.05.2003. Epiphytic on *Quercus ilex* with *O. tenellum* (herb. Sotiaux, *Sotiaux* 2003/271).

Orthotrichum pallens. 2B, Bonifatu forest, along the path to the Carrozu bothie at 750 m, UTM MM99, 16.07.1985. On dead branch with *O. striatum*, *O. lyellii*, *Frullania dilatata*, *Metzgeria furcata* and *Radula complanata* (herb. Sotiaux, *Sotiaux* 4560).

Orthotrichum pumilum. 2A, Conca, Tozza at 350 m, UTM NM2720, 10.05.2003. Epiphytic on *Quercus suber* near the village (herb. Sotiaux, *Sotiaux* 2003/105).

Orthotrichum scanicum. 2A, Quenza, Jallicu at 1100 m, UTM NM0925, 22.05.2003. Epiphytic on *Quercus ilex* near the village (herb. Sotiaux, *Sotiaux* 2003/249).

Orthotrichum schimperii. 2A, Ceccia, Castellu prehistoric site at 120 m, UTM NM2001, 20.05.2003. Epiphytic on *Olea* (herb. Sotiaux, *Sotiaux* 2003/246). 2B, Casta, Agriates desert at 280 m, UTM NN1623, 28.04.1986. Epiphytic on *Pistacia lentiscus* with *O. diaphanum* (herb. Sotiaux, *Sotiaux* 5160); Corte, Restonica road at the city limit at 427 m, UTM NM1283, 27.05.2004. Epiphytic on *Olea* with *O. diaphanum*, *Syntrichia papillosa* and *Frullania dilatata* (herb. Sotiaux, *Sotiaux* 2004/495).

Plagiopus oederianus. 2B, Rusio, 1000 m, UTM NM2189, 01.05.1987. On shaded siliceous rocks with *Bartramia halleriana*, along the track leading to St Alesio chapel (herb. Sotiaux, *Sotiaux* 6432).

Plagiothecium cavifolium. 2B, many localities, e.g. Ghisoni, Casaccio bridge on road D169 at 1357 m, UTM NM1357, 18.05.2004. In rock cave along the stream (herb.

Sotiaux, *Sotiaux* 2004/332); Verde pass, Taravo valley downstream from the bridge of the long-distance trail (GR20) at 1240 m, UTM NM1552, 19.05.2004. On ground at the base of a granitic boulder along the stream (herb. Sotiaux, *Sotiaux* 2004/355); Vizzavona, Agnone valley at 1250 m, UTM NM0863, 20.05.2004. On ground among shaded granitic boulders (herb. Sotiaux, *Sotiaux* 2004/383).

Plagiothecium succulentum. 2B, Canaglia, Manganello forest road at 955 m, UTM NM0868, 21.05.2004. On ground with siliceous rock outcrops (herb. Sotiaux, *Sotiaux* 2004/402); Ghisoni, Alzitone valley at 1030 m, UTM NM1462, 23.05.2004. On ground at the base of a boulder along the stream (herb. Sotiaux, *Sotiaux* 2004/418).

Platyhypnidium lusitanicum. 2A, Vacca, Cagna Mountain, Vitalbetu stream valley at 400 m, UTM NM1001, 05.05.2003. On rocks along the stream (herb. Sotiaux, *Sotiaux* 2003/28, det. L. Hedenäs).

Pohlia lescuriana. 2A, Bavella, Volpajola valley at 1010 m, UTM NM1926, 14.05.2003. On ground of a shaded slope in the ravine, with *Pogonatum aloides* (herb. Sotiaux, *Sotiaux* 2003/144).

Pohlia longicolla. 2B, Haut-Asco, UTM MM99, 11.07.1985. Siliceous rock dip at 1550 m (herb. Sotiaux, *Sotiaux* 4437).

Pohlia prolifera. 2B, Arcarota pass at ca 680 m, UTM NM38, 09.2004. On slope under a chestnut woodland with *Atrichum undulatum* and *Pogonatum aloides* (LG, *Vanderpoorten* 670).

Sphagnum girgensohnii. 2A, Bastelica, Renoz pozzine at 1780 m, UTM NM1153, 01.08.2005. Along a temporary rivulet under *Juniperus* (herb. Royaud, *Royaud* 7551).

Sphagnum russowii. 2A, Bastelica, Monticello pozzine at 1720 m, UTM NM1251, 02.08.2005. Along a temporary rivulet (herb. Royaud, *Royaud* 7574).

Sphagnum tenellum. 2A, Orto, Manganu pozzine at 1785 m, UTM MM9873, 06.08.2005. Along the pozzine margin (herb. Royaud, *Royaud* 7621).

Sphagnum teres. 2B, Ghisoni, Orlandino ravine at 1550 m, UTM NM1256, 26.07.2005 (herb. Royaud, *Royaud* 7507).

Tortula brevissima. 2B, Ogliaastro, towards the Ostriconi resort, UTM NN0252, 28.04.1986. Rocky slope along the road at 20 m, with *Tortula atrovirens* (herb. Sotiaux, *Sotiaux* 5177).

Checklist of Corsican bryophytes

Altogether, the Corsican bryoflora includes 540 species and six varieties: 148 species and one variety of liverworts, 389 species and five varieties of mosses and three species of hornworts (Table 2).

DISCUSSION

Diversity of the Corsican bryoflora

With 389 species, the moss flora of Corsica is slightly richer than the expected number of species in relation to island

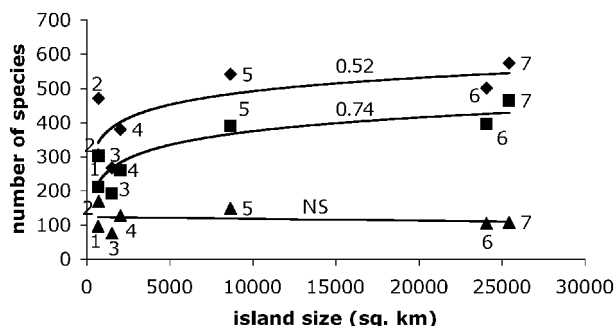


Figure 1. Number of moss (squares), liverwort (triangles) and bryophyte (diamonds) species in Corsica (five) as compared with other western Mediterranean and Mediterraneo-Atlantic islands [data for Sardinia (six) and Sicily (seven) from Cortini-Pedrotti (2001) and Aleffi (2005); for Madeira (two) from Vanderpoorten, Rumsey & Carine (2007); for La Palma (one), Tenerife (four) and Gran Canaria (three) from A. Vanderpoorten, F. J. Rumsey & M. A. Carine, unpublished]. Lines represent the best-fit trends and associated r^2 values between island size and number of species.

size in a western Mediterranean and Atlantico-Mediterranean context (Fig. 1). In liverworts, by contrast, no trend between island size and species number can be detected. In total, thus, Corsica represents an important area in terms of bryophyte diversity in the western Mediterranean and Atlantico-Mediterranean area. However, the numbers of species reported in the present contribution need to be refined. Indeed, the additions to the bryophyte flora of Corsica detailed here represent >10% of the total number of species reported to date. This strongly suggests that intensive field-work remains necessary to enumerate the total bryophyte diversity of the island and that many new species probably remain to be found.

In the meantime, a systematic revision of the herbarium material is highly desirable. Indeed, while a thorough revision was undertaken for liverworts based on re-examination of herbarium material (Bischler & Jovet-Ast, 1973), many data for mosses were directly taken from the literature and have not yet been the focus of any revision. In particular, 14 mosses *Bryum mildeanum*, *Ditrichum pallidum*, *Entosthodon muhlenbergii*, *Fissidens pusillus*, *Hygrohypnum eugyrium*, *Hyocomium armoricum*, *Hypnum hamulosum*, *Leptobryum pyriforme*, *Oxyrrhynchium speciosum*, *Oxystegus tenuirostris*, *Pogonatum nanum*, *Polytrichum strictum*, *Rhabdoweisia fugax* and *Rhizomnium magnifolium* were mentioned at the end of the 19th century but have not been reported since. Some of those species, such as *Hyocomium armoricum*, are readily recognizable, but some others are taxonomically more difficult and their occurrence in Corsica would need to be confirmed.

Specificity of the Corsican bryoflora

Among the 540 species reported to date, the complete absence of any endemic bryophyte species, at least in a

traditional morphology-based sense, is surprising given its fairly high proportion in angiosperms. In Macaronesia, similarly, the *ca* 9% of endemics in the bryophyte flora pale by comparison with the 40% of endemic rates found in the Canary Islands (Vanderpoorten, Rumsey & Carine, 2007). One possible explanation for the lower rates of endemism in oceanic island bryophytes is that endemic speciation is prevented by the existence of extensive gene flow between island and nearby continental populations (Vanderpoorten & Long, 2006). Based on the analysis of genetic differentiation among populations, it is clear that the populations of most bryophyte species are genetically interconnected (for review, see Korpelainen, Pohjamo & Laaka-Lindberg, 2005). Evidence from both genetic data (e.g. Shaw, Werner & Ros, 2003; Rycroft, Groth & Heinrichs, 2004; Heinrichs *et al.*, 2005; McDaniel & Shaw, 2005) and interpretation of distribution patterns (Munoz *et al.*, 2004) is indeed mounting, that many species are capable of long-distance dispersal by wind. We consider testing this hypothesis by indirectly measuring gene flow between Corsican, North African and southern-European populations across a range of taxa.

Conservation value of the Corsican bryoflora

According to the IUCN classification (ECCB, 1995; see also internet updates at <http://www.bio.ntnu.no/ECCB>), the bryophyte flora of Corsica includes seven liverwort and 17 moss species that are red-listed in Europe (Table 3). The

Table 3. Bryophytes red-listed in Europe in the Corsican flora: IUCN status.

Liverworts	
<i>Asterella africana</i> :	V
<i>Athalamia spathysii</i> :	R
<i>Cephaloziella calyculata</i> :	R
<i>Cephaloziella massalongi</i> :	R
<i>Fossombronina echinata</i> :	K
<i>Marchantia paleacea</i> :	K
<i>Riccia perennis</i> :	R
Mosses	
<i>Anacolia webbii</i> :	R
<i>Andreaea frigida</i> :	R
<i>Aschisma carniolicum</i> :	R
<i>Buxbaumia viridis</i> :	R
<i>Campylopus oerstedianus</i> :	R
<i>Campylostelium strictum</i> :	V
<i>Entosthodon durieui</i> :	K
<i>Ephemerum sessile</i> :	R
<i>Fissidens curvatus</i> :	K
<i>Fissidens ovatifolius</i> :	R
<i>Grimmia caespiticia</i> :	R
<i>Grimmia lisa</i> :	R
<i>Grimmia reflexidens</i> :	R
<i>Orthotrichum consimile</i> :	K
<i>Orthotrichum scanicum</i> :	E
<i>Rhynchostegiella durieui</i> :	R
<i>Tortula brevissima</i> :	R

last mention of *Cephaloziella calyculata* and *Marchantia paleacea* dates back to 1973 (Bischler & Jovet-Ast, 1973), while *Cephaloziella massalongi* was only observed by Camus (1895) more than one century ago. In mosses, *Andreaea frigida*, *Campylostelium strictum*, *Entosthodon durieui* and *Rhynchostegiella durieui* were not seen in the course of our investigations. Most of the other red-listed mosses were found in fairly limited amount, except for *Anacolia webbii*, *Fissidens ovatifolius* and *Grimmia lisae*. These three species were discovered in the course of the present survey in more than ten localities, some of which harbored fairly large populations. Furthermore, targeted field surveys recently revealed additional localities of *Buxbaumia viridis*, which can be locally fairly abundant (Hébrard, 2005; Pioli, 2006), so that Corsica represents a significant area for the conservation of those species. The substantial number of new species reported here, however, suggests that we are still far from getting a comprehensive view of the Corsican bryoflora. A better knowledge of the distribution, frequency and ecology of bryophyte species on the island is thus an absolute prerequisite in order to propose appropriate conservation measures in this Mediterranean environment that is, at least locally, severely threatened.

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