

***Orthotrichum gymnostomum* Brid. and other interesting Orthotrichaceae from Calabria (Italy)**

Francisco LARA^{a*}, Domenico PUNTILLO^b, Ricardo GARILLETI^c
& Vicente MAZIMPAKA^a

^a Departamento de Biología (Botánica), Facultad de Ciencias,
Universidad Autónoma de Madrid, Cantoblanco, E-28049 Madrid, Spain

^b Museo di Storia Naturale della Calabria ed Orto Botanico,
Universita della Calabria I-87030 Arcavacata di Rende (CS), Italy

^c Departamento de Botánica, Facultad de Farmacia, Universidad de Valencia,
Campus de Burjassot, E-46100 Valencia, Spain

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Abstract – *Orthotrichum gymnostomum* Brid. is first reported from Calabria (Southern Italy); this is the first record of the species in the Mediterranean Area. In addition, six other species are reported as new to the Calabria region (*Orthotrichum acuminatum* H. Philib., *O. alpestre* Hornsch. ex Bruch, Schimp. & Gumbel, *O. philibertii* Venturi, *O. scanicum* Grönvall, *O. stramineum* Hornsch., and *O. schimperi* Hammar), while new localities are given for *Orthotrichum anomalum* Hedw., *O. shawii* Wilson, *O. speciosum* Nees, *O. tenellum* Brid., and *Ulota crispa* (Hedw.) Brid., most of which had not been reported for this area after 1950.

***Orthotrichum* / *Ulota* / Musci / Mediterranean area**

Resumen – Se da a conocer el hallazgo de *Orthotrichum gymnostomum* Brid. en Calabria (Sur de Italia), lo que representa la primera cita de esta especie en la Región Mediterránea. Además se aportan otras seis novedades para la región de Calabria (*Orthotrichum acuminatum* H. Philib., *O. alpestre* Hornsch. ex Bruch, Schimp. & Gumbel, *O. philibertii* Venturi, *O. scanicum* Grönvall, *O. stramineum* Hornsch. y *O. schimperi* Hammar), y se proporcionan nuevas localidades para *Orthotrichum anomalum* Hedw., *O. shawii* Wilson, *O. speciosum* Nees, *O. tenellum* Brid. y *Ulota crispa* (Hedw.) Brid., la mayoría de las cuales no habían sido citadas después de 1950 en el área.

INTRODUCTION

The Calabrian region is located in the southernmost part of the Italian Peninsula (Fig. 1). It is an area of diverse landscapes and undoubted botanic interest. In spite of this, few bryological data are available on this region.

* Correspondence and reprints: francisco.lara@uam.es

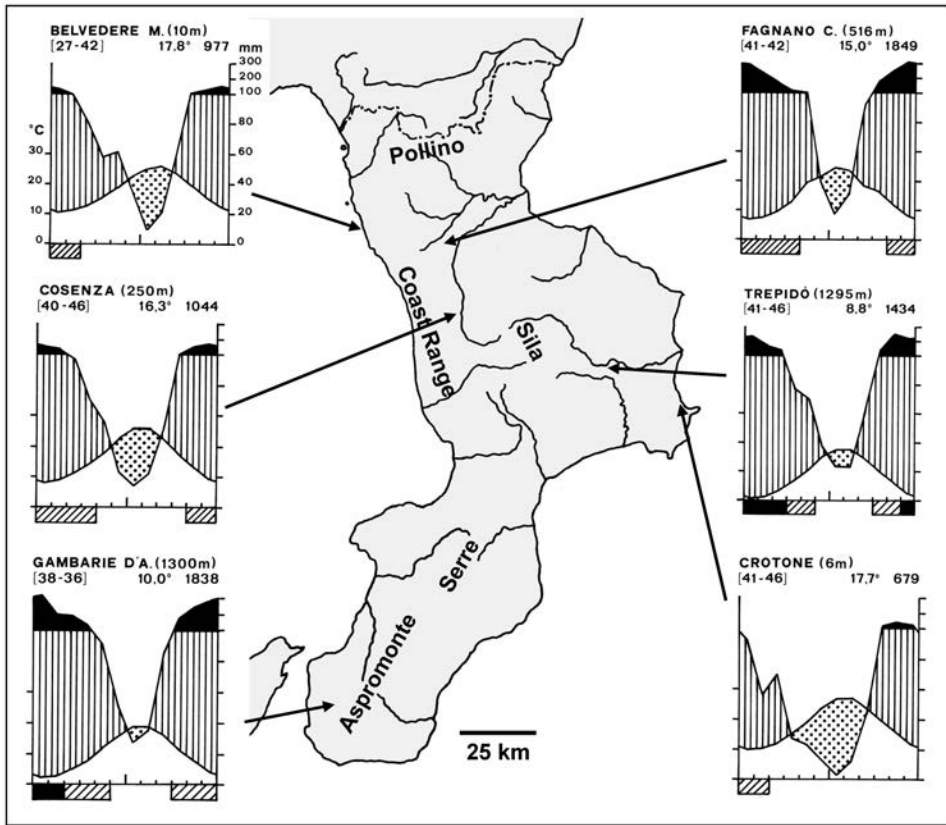


Fig. 1. Calabria (Italia). Main mountain ranges and representative ombrothermic diagrams. Between square brackets: number of years with available data of temperature (left) and precipitation (right).

Concerning Orthotrichaceae, only 14 species have been cited in this area. Cortini Pedrotti (2001) reports the presence of *Zygodon rupestris* Lorentz, *Orthotrichum affine* Brid., *O. cupulatum* Brid., *O. lyellii* Hook. & Taylor, *O. pumilum* Sw., *O. rupestre* Schwägr., *O. striatum* Hedw., *O. speciosum* Nees, *O. anomalum* Hedw., *O. diaphanum* Brid., *O. shawii* Wilson, *O. tenellum* Bruch ex Brid., and *Ulota crispa* (Hedw.) Brid. The last five were reported before 1950, while *Orthotrichum speciosum* is known from one site only (Aleffi *et al.*, 2001). Finally, *Orthotrichum pulchellum* Brunt., has been recently recorded in two localities of this region (Aleffi *et al.*, 2001; Lara *et al.*, 2002).

Based on the study of more than 200 samples collected by one of the authors (D. Puntillo), this paper intends to update the data on the representation of the family Orthotrichaceae in this region. The Calabrian bryophyte flora has now seven new *Orthotrichum* species: *O. gymnostomum* Brid., *O. acuminatum* H. Philib., *O. alpestre* Hornsch. ex Bruch, Schimp. & Gumbel, *O. philibertii* Venturi, *O. scanicum* Grönvall, *O. stramineum* Hornsch., and *O. schimperi* Hammar, the first of which is also new to the Italian bryoflora. We also give new localities for the species that had not been collected since 1950 (the very common *O. dia-*

phanum is omitted), and report new populations of *Orthotrichum speciosum* and *O. alpestre*. This revision shows that *Orthotrichum affine*, *O. diaphanum*, *O. lyellii*, *O. rupestre*, *O. striatum*, *O. cupulatum*, and *Zygodon rupestris* are the most frequent Orthotrichaceae in this area.

For each species, the Calabrian localities are detailed and a distribution map is given. All vouchers are deposited in CLU.

***Orthotrichum gymnostomum* Brid.**

(Figs 2-7)

COSENZA: Sila Grande, Fossiata, 1260 m, *Puntillo* 04.06.2000, on *Populus nigra*, associated with *Orthotrichum affine*, *O. rupestre*, *O. shawii* and *O. speciosum* (CLU 1611).

This is a small epiphytic species, with a compact habit due to the imbricated position of its leaves when dry. It is characterised by its ovate-lingulate, concave leaves with incurved margins, having two distal papillae in both sides of each cell, and by the absence of peristome in the capsules. The general aspect of the plant, the shape of the leaves and the presence of propagules on them could, at first sight, cause confusion with *Orthotrichum obtusifolium* Brid. and *O. macrocephalum* F. Lara, Garilleti & Mazimpaka. The first one has leaves with erect, not involute margins and only one papilla per cell, while *Orthotrichum macrocephalum* can be recognised by its leaves with recurved margins and pluripapillose cells. The specimens collected in Calabria had no sporophytes, but they did have all the gametophytic characteristics of the species (Figs 2-6).

Orthotrichum gymnostomum is basically an European species (Vitt, 1973; Lewinsky, 1993), spread throughout the northern (Finland, Norway, Sweden, Denmark, Latvia), central (France, Germany, Switzerland, Austria) and eastern (Poland, Czech Republic, Slovakia, Ukraine) parts of the continent. It was also known from a single collection from Scotland (Hill *et al.*, 1994), where it has recently been refound (Blockeel, *pers. comm.*). On the American continent, an abundant population exists in the island of Newfoundland (Canada), although it is not clear whether its origin is natural or anthropic. Therefore, this moss had never been found previously in the Mediterranean area, and the Calabrian locality shows a marked disjunction with the general European area.

The Italian population of *O. gymnostomum* is located at an altitude higher than 1200 m while most of the previously known localities are situated below 600 m (Lewinsky-Haapasaari, 1995). This apparently abnormal situation is due to the lower latitude of Calabria. The other ecological data about this new population are similar to those usually described, since it was found living on the trunk of a Poplar tree, and the most frequent phorophytes for this moss are the species of the genus *Populus*.

The examined sample had few specimens of *Orthotrichum gymnostomum*, but the real importance of the Italian population is still unknown pending further prospections. In the rest of Europe, it is considered to be a rare or very rare species, with scarce localities where it is a more or less common epiphyte.

***Orthotrichum acuminatum* H. Philib.**

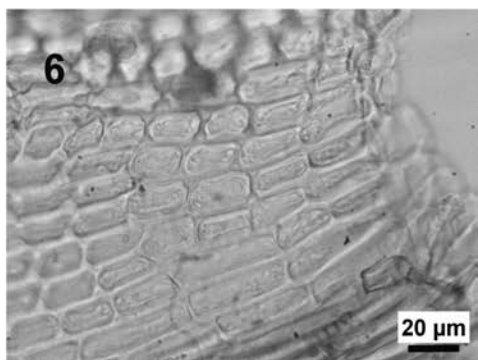
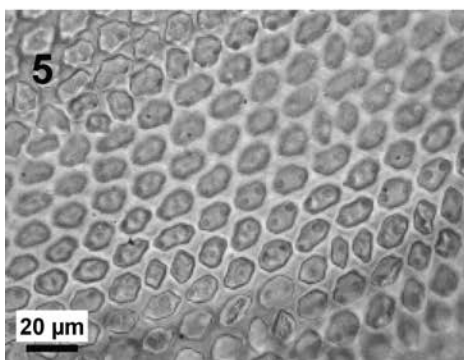
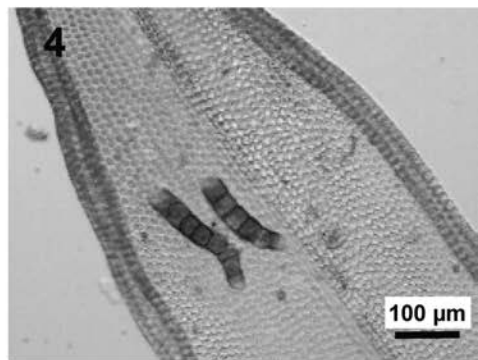
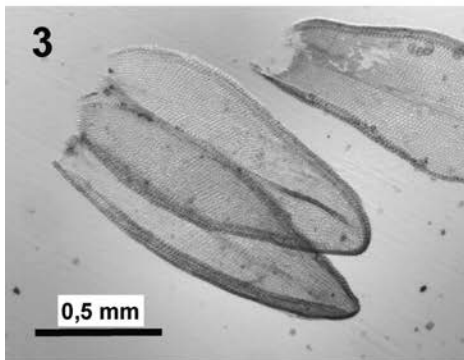
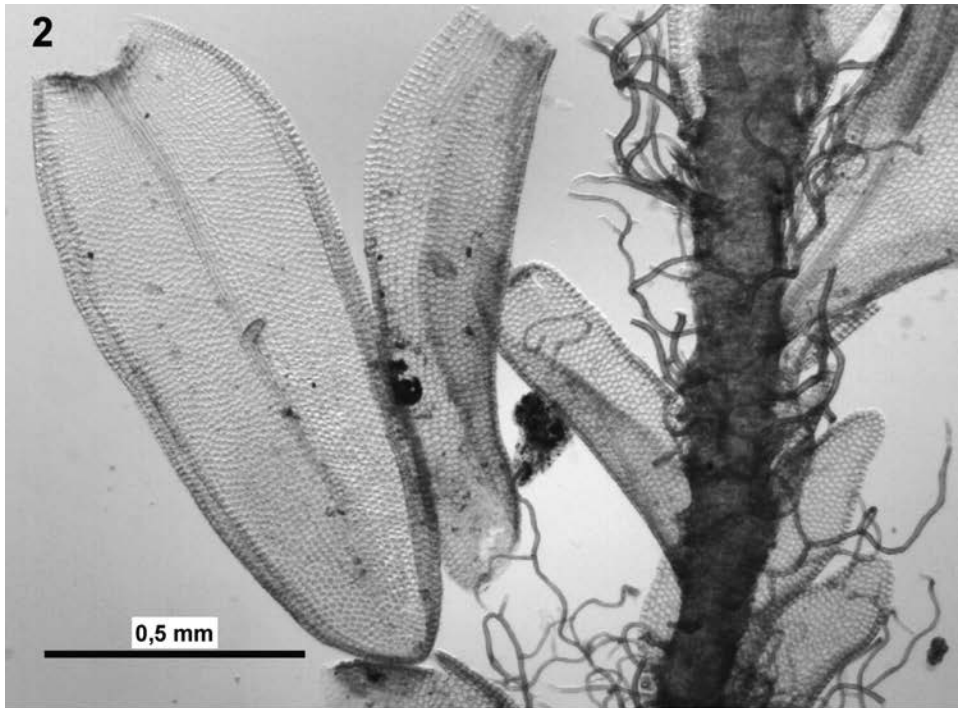
(Fig. 8)

COSENZA: Castiglione Casentino, Valle del fiume Arente, 260 m, *Puntillo* 04.08.2002, on *Corylus avellana*, growing with *Orthotrichum affine* and *O. lyellii* (CLU 3659).

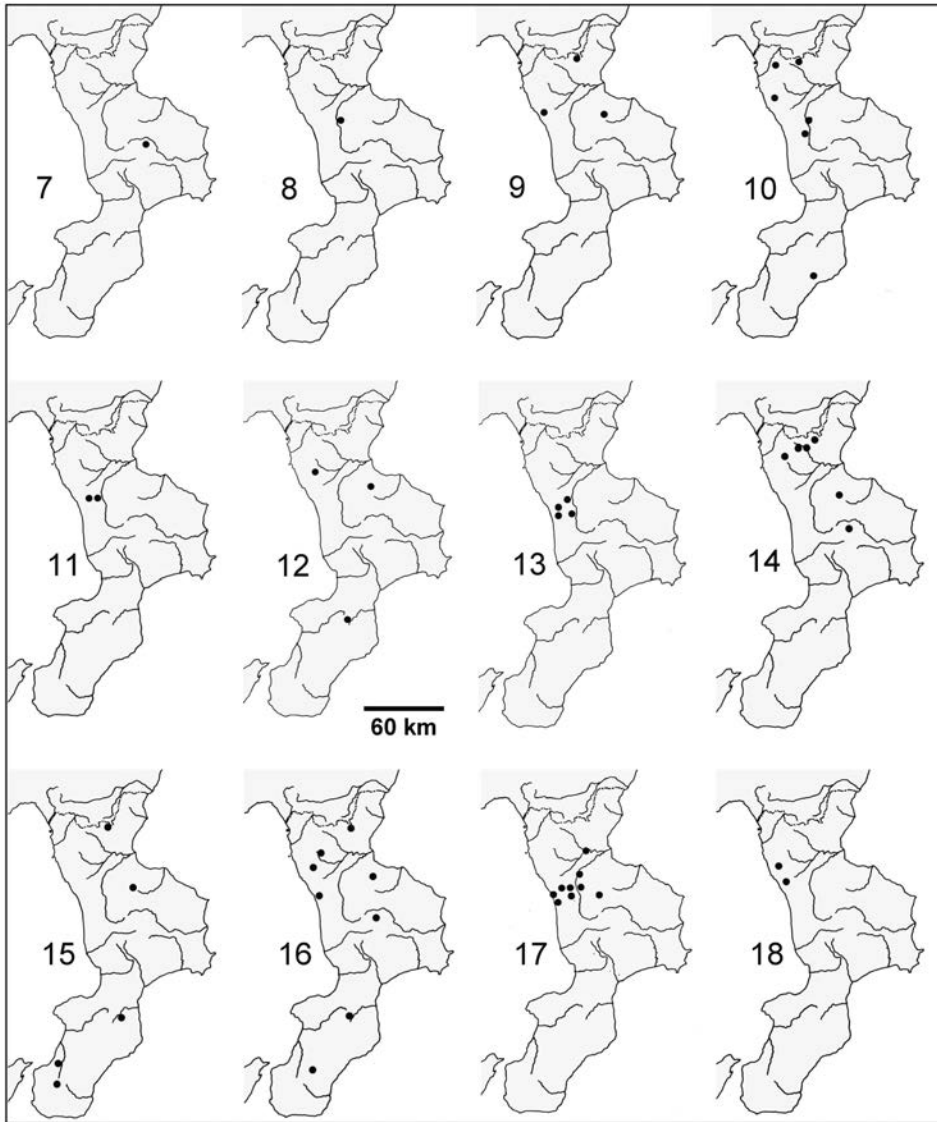
***Orthotrichum alpestre* Hornsch. ex Bruch, Schimp. & Gumbel**

(Fig. 9)

COSENZA: Sila Grande, Vallone Fossiata, 1250 m, *Puntillo* 18.06.2000, on *Populus nigra* (CLU 2077). San Benedetto Ullano, Laghicello, 1130 m, *Puntillo* 01.07.2001,



Figs 2-6. *Orthotrichum gymnostomum* Brid. from Calabria. **2:** Leaf, ventral view, and stem with rhizoids and leaves; note that basal leaves are much smaller and have a very short nerve. **3:** General aspect of two leaves, the top one in dorsal view, and the bottom one in ventral view. **4:** Propagules in the ventral middle zone of a leaf. **5:** Upper leaf cells, each one with two distal papillae. **6:** Basal leaf cells.



Figs 7-18. Situation of the localities in the Calabrian region. 7: *Orthotrichum gymnostomum*. 8: *O. acuminatum*. 9: *O. alpestre*. 10: *O. anomalum*. 11: *O. philibertii*. 12: *O. scanicum*. 13: *O. schimperi*. 14: *O. shawii*. 15: *O. speciosum*. 16: *O. stramineum*. 17: *O. tenellum*. 18: *Ulota crispa*.

on *Fagus sylvatica*, with *Ulota crispa* (CLU 2763). *Ibidem*, Puntillo 24.06.2001, on *Fagus sylvatica*, with *Orthotrichum affine*, *O. lyellii*, *O. scanicum* and *O. striatum* (CLU 2750). Pollino, Serra delle Serra di Crispo-Serra delle Diavole, 2000 m, Puntillo 16.08.2001, on *Pinus leucodermis*, with *Orthotrichum rupestre* and *O. shawii* (CLU 3726).

Orthotrichum anomalum* Hedw.*(Fig. 10)**

COSENZA: Castiglione Cosentino, Valle del fiume Arente, *Puntillo* 23.01.2000, on acidic rock (CLU 1331). Fagnano Castello, Lago Trifoglietti, *Puntillo* 24.06.2001, on *Fagus sylvatica*, with *Orthotrichum affine*, *O. lyellii*, *O. scanicum* and *O. striatum* (CLU 2750). Mendicino, Monte Cocuzzo, 1480 m, *Puntillo* 10.12.2000, on calcareous rock (CLU 1780). Pollino, Falde del Pollinello, 1050 m, *Puntillo* 21.04.2002, on calcareous rock, with *Orthotrichum cupulatum* (CLU 3765). San Donato di Ninea, Mezzafumina, 648 m, *Puntillo* 11.02.2001, on *Alnus glutinosa*, with *Orthotrichum striatum* (CLU 2253).

REGGIO CALABRIA: Aspromonte. Ceravolo, 980 m, *Puntillo* 11.04.1998, on acidic soil (CLU 478).

Orthotrichum philibertii* Vent.*(Fig. 11)**

COSENZA: Montalto Uffugo, Bosco di Mavigliano, 210 m, *Puntillo* 01.01.1998, on *Quercus pubescens*, with *Orthotrichum diaphanum* and *O. tenellum* (CLU 1241). *Ibidem*, *Puntillo* 01.04.2001, on *Quercus pubescens* (CLU 2484). *Ibidem*, *Puntillo* 04.01.1999, on *Quercus pubescens*, with *Orthotrichum affine*, *O. schimperi* and *O. tenellum* (CLU 3898). Rende, Coda di Volpe, 210 m, *Puntillo* 18.03.1998, with *Orthotrichum diaphanum* and *O. tenellum* (CLU 525). *Ibidem*, with *Orthotrichum diaphanum* and *O. schimperi* (CLU 524).

Orthotrichum scanicum* Grönvall*(Fig. 12)**

COSENZA: Fagnano Castello, Lago Trifoglietti, *Puntillo* 24.06.2001, on *Fagus sylvatica*, with *Orthotrichum affine*, *O. alpestre*, *O. lyellii* and *O. striatum* (CLU 2750). Sila Grande, Cava dell'Orso, 1150 m, *Puntillo* 09.06.2002, on *Salix* sp., with *Orthotrichum affine* and *O. striatum* (CLU 3503).

VIBO VALENTIA: Brognaturo, Lacina, 980 m, *Puntillo* 28.04.2001, on *Crataegus* sp., with *Isothecium myosuroides*, *Neckera complanata*, *N. pumila*, *Orthotrichum affine* and *Radula complanata* (CLU 2596).

Orthotrichum schimperi* Hammar*(Fig. 13)**

COSENZA: Rende, Orto Botanico, 210 m, *Puntillo* 06.07.1999, on *Olea europaea*, with *Orthotrichum diaphanum* and *O. tenellum* (CLU 1.052). *Ibidem*, *Puntillo* 28.01.2002, on *Quercus pubescens*, with *O. diaphanum*, *O. tenellum* and *O. striatum* (CLU 3819 & 3798). Rende, Coda di Volpe, *Puntillo* 18.03.1998, on *Populus nigra*, with *Orthotrichum diaphanum* and *O. philibertii* (CLU 524). Rende, Commenda, *Puntillo* 12.01.2003, on *Magnolia* sp., with *Orthotrichum diaphanum* (CLU 3797). Montalto Uffugo, Bosco di Mavigliano, 210 m, *Puntillo* 04.01.1999, on *Quercus virgiliana*, with *Orthotrichum affine*, *O. philibertii*, *O. tenellum* and *Zygodon rupestris* (CLU 3898). Montalto Uffugo Scalo, 200 m, *Puntillo* 09.02.2003, on *Olea europaea*, with *Orthotrichum diaphanum* and *Orthotrichum tenellum* (CLU 3825).

Orthotrichum shawii* Wilson*(Fig. 14)**

COSENZA: Pollino, Campotenese, 1080 m, *Puntillo* 14.12.1997, on *Populus nigra*, with *Orthotrichum affine* and *O. lyellii* (CLU 451). Pollino, Serra delle Serra di Crispo-Serra delle Diavole, 2000 m, *Puntillo* 16.08.2001, on *Pinus leucodermis*, with *Orthotrichum alpestre* and *O. rupestre* (CLU 3726). Sant'Agata d'Esaro, Fontana Corna, 1050 m, *Puntillo* 26.05.2002, on *Alnus cordata* (CLU 3767). Sila Grande, Fossiatà, 1260 m, *Puntillo* 04.06.2000, on *Populus nigra*, with *Orthotrichum affine*, *O. gymnostomum*, *O. rupestre* and *O. speciosum* (CLU 1611). Sila Grande, Lago Savuto, 1180 m, *Puntillo* 18.08.2002, on *Salix* sp., with *Orthotrichum affine* and *O. stramineum* (CLU 3660).

Orthotrichum speciosum Nees

(Fig. 15)

COSENZA: Pollino, Timpa di Porace, *Puntillo* 01.11.98, 1220 m, on *Quercus ilex*, with *Orthotrichum stramineum* and *O. rupestre* (CLU 1333). Sila Grande, Fossiateda, 1260 m, *Puntillo* 04.06.2000, on *Populus nigra*, with *Orthotrichum affine*, *O. gymnostomum*, *O. rupestre* and *O. shawii* (CLU 1611).

VIBO VALENTIA: Brognaturo, Lacina, 980 m, *Puntillo* 28.04.2001, on *Crataegus* sp., with *Orthotrichum affine*, *O. stramineum* and *O. striatum* (CLU 2596).

Orthotrichum speciosum has also been recently found in Reggio Calabria (Aleffi *et al.*, 2001).

Orthotrichum stramineum Hornsch.

(Fig. 16)

COSENZA: Pollino, Timpa di Porace, 1220 m, *Puntillo* 01.11.98, on *Quercus ilex*, with *Orthotrichum speciosum* and *O. rupestre* (CLU 1333). San Benedetto Ullano, Cozzo Cervello, 1320 m, *Puntillo* 01.07.2001, on *Fagus sylvatica*, with *Orthotrichum rupestre* (CLU 2762). San Donato di Ninea, Mezzafumina, 648 m, *Puntillo* 11.02.2001, on *Alnus glutinosa*, with *Frullania dilatata*, *O. lyellii*, *O. striatum* and *Pterigynandrum filiforme* (CLU 2263). *Ibidem*, on *Sambucus nigra*, with *Orthotrichum affine* (CLU 980). Sant'Agata d'Esaro, Fontana Corna, 1050 m, *Puntillo* 26.05.2002, on *Alnus cordata* (CLU 3767). *Ibidem*, *Puntillo* 16.05.2002, with *Orthotrichum affine* and *O. lyellii* (CLU 3519). Sila Grande, Cava dell'Orso, 1100 m, *Puntillo* 09.06.2002, on *Salix* sp., with *Orthotrichum affine* and *O. striatum* (CLU 3544). Sila Piccola, Lago Savuto, 1180 m, *Puntillo* 18.08.2002, on *Salix* sp., with *Orthotrichum affine* and *O. shawii* (CLU 3660).

REGGIO CALABRIA: Aspromonte, Valle torrente Vasi, 920 m, *Puntillo* 04.07.1999, on *Sambucus nigra*, with *Orthotrichum affine* and *Zygodon rupestris* (CLU 980).

VIBO VALENTIA: Brognaturo, Lacina, 980 m, *Puntillo* 28.04.2001, on *Crataegus* sp., with *Orthotrichum affine*, *O. speciosum* and *O. striatum* (CLU 2596). Brognaturo, Vallone Fondo, 970 m, *Puntillo* 28.04.2001, on *Sambucus nigra* (CLU 2524). *Ibidem*, *Puntillo* 28.04.01, on *Sambucus nigra*, with *Orthotrichum affine* (CLU 2530). *Ibidem*, *Puntillo* 28.04.01, with *Orthotrichum diaphanum*, *O. striatum* and *Dicranoweisia cirrata* (CLU 3027). *Ibidem*, *Puntillo* 28.04.01, on *Fagus sylvatica* (CLU 2696).

Orthotrichum tenellum Bruch ex Brid.

(Fig. 17)

CATANZARO: Falerna, Vallone Inferno, 250 m, *Puntillo* 06.01.2001, on bark (CLU 2019).

COSENZA: Falconara Albanese, Monte Guardia, 680 m, *Puntillo* 30.07.2000, on bark, with *Orthotrichum striatum* (CLU 2425). Bisignano, Valle del fiume Mucone, 70 m, *Puntillo* 09.02.2003, on bark, with *Orthotrichum affine* and *O. diaphanum* (CLU 4000). Castiglione Casentino, Valle del fiume Arente, 300 m, on *Quercus suber*, with *Orthotrichum rupestre* (CLU 1334). Montalto Uffugo, Bosco di Mavigliano, 210 m, *Puntillo* 01.01.1998, on *Quercus pubescens*, with *Orthotrichum diaphanum* and *O. philibertii* (CLU 1241). Montalto Uffugo, Scalo, 200 m, *Puntillo* 09.02.2003, on *Olea europaea*, with *Orthotrichum diaphanum* and *O. schimperi* (CLU 3825). Paola, Valle del fiume San Francesco, 220 m, *Puntillo* 20.10.2002, on *Quercus* sp. (CLU 3743). Rende, Coda di Volpe, 210 m, *Puntillo* 18.03.1998, on *Populus nigra*, with *Orthotrichum diaphanum* and *O. philibertii* (CLU 525, 3758). Rende, Orto Botanico dell'Università, 200 m, *Puntillo* 28.01.2002, on *Quercus* sp., with *Orthotrichum diaphanum*, *O. schimperi* and *O. striatum* (CLU 3819). Rende, Valle del torrente Emoli, 350 m, *Puntillo* 23.02.2003, on bark, with *Orthotrichum lyellii* (CLU 3870). Sila Grande, Camigliatello Silano, 1.280 m, *Puntillo* 14.07.1990,

on *Sambucus nigra*, with *Orthotrichum affine* (CLU 3897). Tarsia, 70 m, *Puntillo* 06.01.2000, on bark, with *Frullania dilatata* (CLU 2142).

***Ulota crispa* (Hedw.) Brid.**

(Fig. 18)

COSENZA: Fagnano Castello, Lago Trifoglietti, 1010 m, *Puntillo* 17.05.1998, on *Alnus cordata* (CLU 547, 577 & 2067). *Ibidem*, *Puntillo* 23.07.2000, on *Fagus sylvatica*, with *Orthotrichum lyellii* and *Orthotrichum striatum* (CLU 2066). *Ibidem*, *Puntillo* 17.05.98, with *Orthotrichum lyellii* (CLU 2783). San Benedetto Ullano, Laghicello, 1130 m, *Puntillo* 01.07.2001, on *Fagus sylvatica*, with *Orthotrichum alpestre* (CLU 2763).

REFERENCES

- ALEFFI M., BONINI I., CARRATELLO A., COGONI A., CORTINI PEDROTTI C., MISERERE L., PREZZAVENTO A.D., PRIVITERA M., PUNTILLO D. & SGUAZZIN F., 2001 — Contributo alla flora briologica dell'Aspromonte (Calabria). *Informatore Botanico Italiano* 33(1): 17-25.
- CORTINI PEDROTTI C., 2001 — New Check-list of the mosses of Italy. *Flora Mediterranea* 11: 23-107.
- HILL M.O., PRESTON C.D. & SMITH A.J.E., 1994 — *Atlas of the Bryophytes of Britain and Ireland, volume 3. Mosses (Diplolepidae)*. Colchester, Harley Books, 412 pp.
- LARA F., GARILLETI R., MAZIMPAKA V., LO GIUDICE R., 2004 — Some new or interesting *Orthotrichum* from Italy. *Braun-Blanquetia* 34: 11-13.
- LEWINSKY J., 1993 — A synopsis of the genus *Orthotrichum* Hedw. (Musci, Orthotrichaceae). *Bryobrothera* 2: 1-59.
- LEWINSKY-HAAPASAARI J., 1995 — Illustrierter Bestimmungsschlüssel zu europäischen *Orthotrichum*-Arten. *Meylania* 9: 3-57.
- VITT D.H., 1973 — A revision of the genus *Orthotrichum* in North America, North of Mexico. *Bryophytorum Bibliotheca* 1: 1-208, 60 fig.