

# Bryophyte Check-list of Murcia Province (Southeastern Spain)

---

María J. Cano, Juan A. Jiménez, M. Teresa Gallego, Rosa M. Ros & Juan Guerra

Departamento de Biología Vegetal, Área de Botánica, Facultad de Biología, Universidad de Murcia, Campus de Espinardo, 30100 Murcia, Spain.

## Abstract

### Correspondence

M. J. Cano

Tel: + 34 968 364991

E-mail: mcano@um.es

**Received:** 12 November 2003

**Accepted:** 10 July 2004

A check-list of the bryophytes of Murcia province is provided. Bryophyte diversity in Murcia consists of 200 taxa (74 genera) of mosses and 32 taxa (20 genera) of liverworts. *Pseudocrossidium obtusulum* is reported as new to the Iberian Peninsula. A total of 30 taxa are new record from Murcia: *Acaulon casasianum*, *Astomum levieri*, *Bryoerythrophyllum recurvirostrum*, *Crossidium laevipilum*, *Entosthodon convexus*, *Grimmia dissimulata*, *Gymnostomum lanceolatum*, *Hedwigia ciliata*, *Orthotrichum affine*, *O. pumilum*, *O. scanicum*, *O. schimperi*, *O. striatum*, *O. tenellum*, *O. tortidontium*, *O. vittii*, *Philonotis fontana*, *Pleuridium acuminatum*, *Pohlia cruda*, *Pterygoneurum subsessile*, *Rhynchostegiella tenella*, *Schistidium crassipilum*, *Schistidium singarense*, *Syntrichia virescens*, *Tortula canescens*, *T. mucronifolia*, *Weissia brachycarpa*, *W. condensata* var. *armata*, *Athalamia hyalina*, and *Jungermannia atrovirens*. Thirty eight taxa (33 mosses and 5 liverworts) are excluded from the check-list or represent doubtful reports for Murcia.

**Key words:** Bryophytes, Check-list, Murcia, SE Spain.

## Resumen

*Catálogo de los briófitos de la provincia de Murcia (Sureste de España).*

Se realiza un catálogo de los briófitos de la provincia de Murcia. La diversidad briofítica de Murcia se estima en 200 taxones (74 géneros) de musgos y 32 taxones de hepáticas (20 géneros). *Pseudocrossidium obtusulum* se cita por primera vez en la Península Ibérica. Un total de 30 taxones son novedades para la provincia de Murcia: *Acaulon casasianum*, *Astomum levieri*, *Bryoerythrophyllum recurvirostrum*, *Crossidium laevipilum*, *Entosthodon convexus*, *Grimmia dissimulata*, *Gymnostomum lanceolatum*, *Hedwigia ciliata*, *Orthotrichum affine*, *O. pumilum*, *O. scanicum*, *O. schimperi*, *O. striatum*, *O. tenellum*, *O. tortidontium*, *O. vittii*, *Philonotis fontana*, *Pleuridium acuminatum*, *Pohlia cruda*, *Pterygoneurum subsessile*, *Rhynchostegiella tenella*, *Schistidium crassipilum*, *Schistidium singarense*, *Syntrichia virescens*, *Tortula canescens*, *T. mucronifolia*, *Weissia brachycarpa*, *W. condensata* var. *armata*, *Athalamia hyalina* y *Jungermannia atrovirens*. Treinta y ocho taxones (33 musgos y 5 hepáticas) se han excluido del catálogo de la provincia o se citan como dudosos.

**Key words:** Briófitos, Catálogo, Murcia, SE España.

## Introduction

The province of Murcia is located in the southeast of the Iberian Peninsula. It covers an area of 11320 km<sup>2</sup>, and is bordered, from South to North, by Almería, Granada, Albacete and Alicante and on the east by the Mediterranean Sea (Fig. 1). The relief is fairly mountainous, the highest peak being Revolcadores (2021 m). Overall, more than 60% of this area is located between 100-600 m and 32% between 600-2000 m. The Segura river and its tributaries, the Argos, Benamor, Guadalentín, Mula and Quipar, are the most important water courses traversing the province. Geologically, it is included within the Betic range. The dominant rock-formations are limestones and dolomites, giving the soils a highly basic character. There is also a significant expanse of volcanic rocks in the south (Campo de Mazarrón, Sierras and Campo de Cartagena). Quaternary deposits are present in the river basins. The climate is typically Mediterranean. Annual average temperatures vary between 8-13°C inland and 18-19°C in coastal areas, descending to 4-8°C in some high places in Sierra Espuña, del Cambrón and in the northwest. Annual average rainfall varies between 200 mm in coastal areas and 650-700 mm in some mountainous ranges close to Moratalla. An introduction to the geography, biogeography, vegetation and vascular flora of the area treated can be found in Sánchez-Gómez & Guerra (2003).

The first record of a bryophyte from Murcia seems to be by Colmeiro (1889), who, in his book containing an enumeration and revision of the plants of the Iberian Peninsula and Balearic Islands, cited a liverwort, *Plagiochasma aitonía* Lindenb. & Nees [*Plagiochasma rupestre* (J. R. Forst. & G. Forst.) Steph.], collected by the Dane, J. Lange, in the fortress of Monteagudo. However, there were other collectors in the XIX century, including A. Guirao, a secondary school teacher who lived in Murcia from 1850 to 1857 and collected plants. One moss collected by him is deposited in PC [*Fissidens grandifrons* Brid., Murcia, Fontis del Marqués in Serra de Espuña, XI-1852, Guirao (PC)] and was reported by Allorge & Allorge (1946).

From 1940, the collection of bryophytes in Murcia began to increase mainly as a result of visits by foreign bryologists on their field trips. These include Ade & Koppe (1942), who reported some bryophytes from La Fuensanta, Allorge & Allorge (1946), who visited Sierra Espuña, La Fuensanta and Ifré (close to Mazarrón), Rungby (1962), who cited some mosses collected in La Fuensanta, and later, near Cartagena: Peña del Águila, Estrechos and Los Blancos (Rungby

1964) and Jovet-Ast & Bischler (1976), who reported some liverworts from different localities in Murcia. Contributions from Spanish bryologists at the same time included those of Esteve & Cortés Latorre (1954) and Cortés Latorre (1955), who cited some mosses in the Sierra de Cartagena, and Casas (1973) who visited some localities in Murcia on a field trip through southeastern Spain.

In 1981, the Bryology Laboratory of the University of Murcia was established. The formation of a permanent team of bryologists provided more detailed knowledge of the territory. Thus, from this time onwards, there have been numerous contributions to the bryophyte flora of the province such as those of Alcaraz et al. (1982), Ros (1984) and Ros & Guerra (1985, 1988). Of particular importance are the floristic paper by Ros & Llimona (1984) in the Sierras de Ponce and Quipar and, above all, the catalogue of the terricolous species of the province carried out by Ros & Guerra (1987), who provided a list of 211 taxa. Further details of the bryological collections and previous collectors in Murcia are given in Ros (1986). More recent, contributions deserving mention are some new records for the province reported by Ros et al. (1996), a study of the mountain range of the La Unión (Sánchez-Moya & Cano 1999) and a study of the urban bryophytes of Murcia city (Rams et al. 2000).

The aim of this work is to update the catalogue of bryophytes for the province of Murcia. This checklist will contribute to a better understanding of the ecology, distribution and conservation status of the bryophytes of this province.

## Material and Methods

For the past two years, we have carried out intensive field-work in some poorly collected areas in the studied territory. Moreover, we have checked more than 700 herbarium specimens mainly from the herbarium of MUB, of which about 250 were collected during this study. Other critical records have been checked from BCB, C, MA, and PC. Figure 1 shows the localities studied. Additionally, bibliographic references have been compiled. The resulting list is arranged in alphabetic order of genus and species. For the generic circumscription of mosses, we have consulted and largely followed Crosby et al. (1999) and some recent revisionary studies, except for Pottiaceae where we have followed the available fascicles of «Flora Briofítica Ibérica» (Guerra & Cros 2000-2004). For liverworts, we have followed Grolle & Long (2000). Under each accepted name a list of selected material studied and previous

bibliographic records are included. When the taxon was reported under a different name this is indicated. Excluded or doubtful records and a list of synonyms are provided at the end of the checklist.

## Results

### Check-list

#### Mosses

##### *Acaulon casasianum* Brugués & H.A. Crum

Studied material: Cehegín, carretera a la Cañara, 30SWH0820, 500 m, *Ros* (MUB 1272); Jumilla, Cerro de la Rosa, 30SXH5555, 600 m, 21-XII-1982, *Ros* (MUB 3140). On gypsiferous soils.

New record for Murcia. It was reported from Murcia (Guerra 2003), but no locality was indicated. Therefore, the specimens above cited support the record for this species. Hitherto, this species has been reported from Alicante, Barcelona, Granada, Lérida, Murcia and Zaragoza in the Iberian Peninsula (Guerra 2003).

##### *Acaulon dertosense* Casas, Sérgio, Cros & Brugués

Selected material studied: Bullas, El Carrascalejo, 30SXH1313, 600 m, 5-II-1983, *Ros* (MUB 3351, MUB 4009); Caravaca de la Cruz, carretera Caravaca de la Cruz-Lorca, Barranco Blanco, 30SWH9402, 900 m, 8-I-1983, *Ros* (MUB 1245); Mazarrón, Puerto de Mazarrón, carretera a Bolnuevo, 30SXG5158, 0 m, 19-II-1984, *Ros* (MUB 4003); Mula, Rambla de la Herreña, 30SXH2204, 500 m, *Ros* (MUB 3999); San Javier, cruce carretera Cartagena-Alicante a Los Narejos, 30SXG9084, 0 m, 18-II-1984, *Ros* (MUB 4006); Ulea, Estación de Ulea, 30SXH5026, 200 m, *Ros* (MUB 1246). Clayey, gypsiferous open soils, sometimes nitrified.

Previous records: *Ros* & Guerra (1987, 1988); Casas et al. (1989).

##### *Acaulon triquetrum* (Spruce) Müll. Hal.

Selected material studied: Abarán, Sierra de la Pila, Barranco de las Cabras, 30SXH5337, 700 m, 22-I-1984, *Ros* (MUB 1259); Bullas, El Carrascalejo, 30SXH1313, 600 m, *Llimona et al.* (MUB 233); Cartagena, Sierra de la Muela, Pico La Muela, 540 m, 11-I-2004, *Cano* (MUB 15951); Lorca, Cabezo de Calnegre, 30SXG3953, 100 m, *Ros* (MUB 1274, 2860); Mazarrón, carretera de Mazarrón a Águilas, 30SXG4561, 100 m, 19-II-1984, *Ros* (MUB 1277);

Moratalla, Arroyo de la Rogativa, 30SWH6825, 1100 m, *Ros* (MUB 1263); Murcia, Sierra de Columbares, Fuente de Columbares, 30SXG7399, 300 m, *Ros* (MUB 3970); San Javier, Los Narejos, 30SXG8991, 0 m, *Ros* (MUB 3400). On open soils, including clay.

Previous records: *Ros* & Llimona (1984); *Ros* & Guerra (1987); Casas et al. (1989).

##### *Aloina aloides* (Koch ex Schultz) Kindb.

Selected material studied: Alhama de Murcia, Sierra Espuña, Valle de Leiva, 30SXG3293, 750 m, 20-V-1984, *Ros* (MUB 3456); Bullas, NE del Aceniche, 30SXH1306, 780 m, 6-II-1982, *Ros* & *García Rowe* (MUB 331). On bare soils, and soil accumulated at the base of calcareous rocks.

Previous records: Alcaraz et al. (1982); *Ros* & Llimona (1984); *Ros* & Guerra (1987); Sánchez-Moya & Cano (1999).

##### *Aloina ambigua* (Bruch & Schimp.) Limpr.

Selected material studied: Cartagena, carretera Portman-Los Belones, 30SXG96, 50 m, *Ros* (MUB 118); Cartagena, Cabo Tiñoso, 30SXG6359, 100 m, 25-III-1984, *Ros* (MUB 772). On bare soils, and accumulated soil at the base of calcareous rocks.

Previous records: Alcaraz et al. (1982) sub *Aloina aloides* var. *ambigua*; *Ros* & Llimona (1984); *Ros* & Guerra (1987) sub *Aloina aloides* var. *ambigua*; Guerra et al. (1993); Sánchez-Moya & Cano (1999).

##### *Aloina bifrons* (De Not.) Delgad.

Selected material studied: Murcia, Sierra del Puerto, carretera Murcia-San Javier, 30SXG7091, 180 m, 18-II-1984, *Ros* (MUB 4198); Murcia, El Valle, 30SXG6399, 200 m, *Ros* (MUB 3290). On gypsiferous soils.

Previous records: *Ros* & Guerra (1987).

##### *Aloina brevirostris* (Hook. & Grev.) Kindb.

Studied material: Las Torres de Cotillas, Los Pulpites urbanización al W de la urbanización Los Romeros, 20-IV-2002, *Werner* (MUB 12966). On nitrified bare soil.

Previous record: Gallego & Cano (2000).

##### *Aloina rigida* (Hedw.) Limpr.

Selected material studied: Beniel, Embalse de Santomera, 30SXH6722, 100 m, *Acosta-Ballesta* (MUB 770); Las Torres de Cotillas, urbanización Los Romeros, 30-IV-2002, *Ros* (MUB 12965); Río Mula,

Rambla Perea, 30SXH3215, *Ros* (MUB 214). On bare soils, and soils accumulated at the base of calcareous rocks.

Previous records: Casas (1973); Ros & Guerra (1987); Sánchez-Moya & Cano (1999); Rams et al. (2000).

***Anomodon viticulosus*** (Hedw.) Hook. & Taylor

Studied material: Moratalla, Sierra de los Álamos, Cenajo del Agua Cernida, 30SWH8829, 1000 m, 30-IV-1983, *Ros* (MUB 887). Ibidem, 16-III-1985, *Ros* (MUB 3505). On calcareous rocks.

Previous record: Ros & Guerra (1988).

***Antitrichia californica*** Sull.

Studied material: Alhama de Murcia, Sierra de Carrascoy, Rambla de Roy, 30SXG5190, 900 m, 2-IV-1996, *Cano & Ros* (MUB 6043). Epiphytic on trunk of *Quercus rotundifolia* Lam.

Previous record: Ros et al. (1996).

***Aschisma carniolicum*** (F. Weber & D. Mohr) Lindb.

Studied material: entre Yecla y Calasparra, 20-II-1973, *Casas* (BCB 290). Soil between *Stipa tenacissima* L.

Previous records: Casas (1973) sub *Aschisma carniolicum* var. *speciosum*; Casas et al. (1985).

***Astomum crispum*** (Hedw.) Hampe

Studied material: Cehegín, Peña Rubia, 30SXH0416, 580 m, *Ibernón Hernández* (MUB 4010). On bare soil.

Previous records: Casas (1973); Ros & Guerra (1987, 1988) sub *Weissia longifolia*.

***Astomum levieri*** Limpr.

Studied material: San Javier, Isla Grosa, 30SXG0278, 40 m, 6-V-1983, *Ros* (MUB 15656). On bare soil.

New record for Murcia. According to Guerra (2003), this species is known in the Iberian Peninsula from Alicante, Albacete, Algarve, Almería, Gerona, Mallorca and Navarra.

***Barbula bolleana*** (Müll. Hal.) Broth.

Selected material studied: Calasparra, Cañaverosa, 293 m, 26-X-2002, *Cano* (MUB 14027); Caravaca de la Cruz, Fuentes del Marqués, 14-X-2001, *Werner & Ros* (MUB 11931); Cieza, Cañón de Almadenes,

30SXH2633, 200 m, 2-XI-2003, *Cano et al.* (MUB 15700); Moratalla, Cortijo Somogil, Arroyo Hondares, 30SWH9030, 700 m, 30-IV-1983, *Ros* (MUB 1246); Murcia, Sierra del Puerto, Puerto de la Cadena, 30SXG6197, 200 m, 26-V-2003, *Cano* (MUB 15655). On stream banks or wet rocks.

Previous records: Allorge & Allorge (1946) sub *Barbula ehrenbergii*; Alcaraz et al. (1982) sub *Barbula ehrenbergii*; Ros & Llimona (1984) sub *Barbula ehrenbergii*; Gil & Ruiz (1985) sub *Barbula ehrenbergii*; Ros & Guerra (1987) sub *Barbula ehrenbergii*; Casas et al. (1989) sub *Barbula ehrenbergii*.

***Barbula convoluta*** Hedw. var. *convoluta*

Selected material studied: Abarán, Sierra de la Pila, Barranco de las Cabras, 30SXH5337, 700 m, 22-I-1984, *Ros* (MUB 3768). Open soils and fissures of calcareous rock with accumulated soil.

Previous records: Adde & Koppe (1942); Ros & Guerra (1987); Sánchez-Moya & Cano (1999).

***Barbula convoluta*** var. *sardoa* Bruch & Schimp.

Studied material: Jumilla, Sierra del Carche, 30SWH6056, 1100 m, 8-XII-1983, *Ros* (MUB 3200). Fissure of calcareous rock with accumulated soil.

Previous record: Ros & Guerra (1987) sub *Barbula convoluta* var. *commutata*.

This taxon is considered by Frahm & Ahmed (2004) as a separate species (*Barbula commutata* Jur.).

***Barbula unguiculata*** Hedw.

Selected material studied: Alhama de Murcia, Valle del Leiva, 30SXH3193, 15-V-1981, *Ros* (MUB 3532); Bullas, El Carrascalejo, 30SXH1313, 31-I-1981, *Ros* (MUB 178); Puerto Lumbreras, pr. Puerto Lumbreras, 30SXG0461, 550 m, 1-II-2004, *Cano* (MUB 16052). Open soils and fissures of calcareous rock with accumulated soil.

Previous records: Ade & Koppe (1942); Allorge & Allorge (1946); Ros & Llimona (1984); Ros & Guerra (1987); Rams et al. (2000).

***Bartramia stricta*** Brid.

Studied material: Lorca, Sierra de la Torrecilla, Los Majales, 30SXG0372, 600 m, 3-III-1984, *Ros* (MUB 3945). On accumulated soil at the base of acidic rocks.

Previous records: Ros & Guerra (1987); Casas et al. (1992).

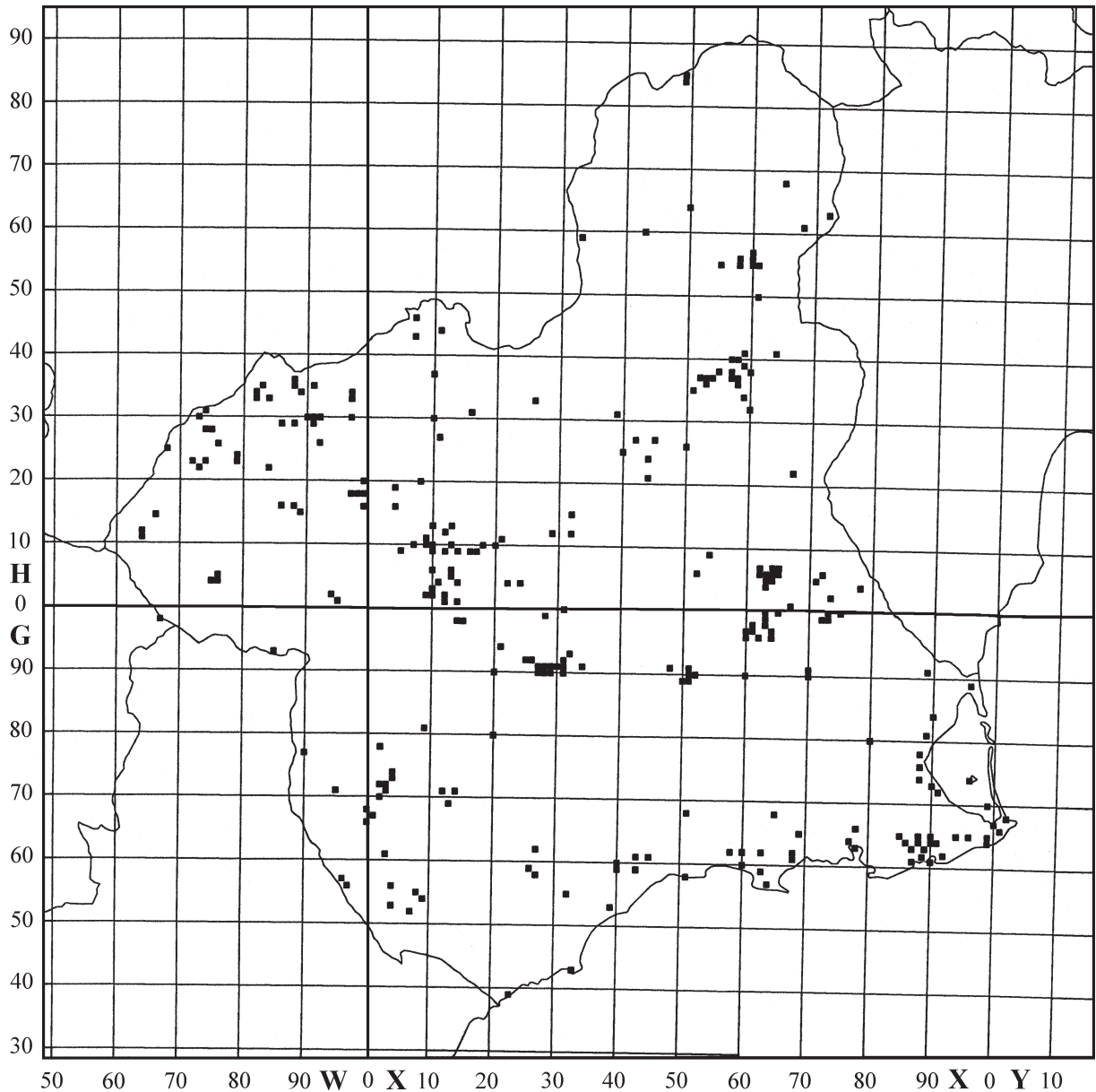


Figure 1. Studied localities in the province of Murcia (southeastern Spain).

Figura 1. Localidades estudiadas en la Provincia de Murcia (Sureste de España).

***Brachythecium glareosum*** (Bruch ex Spruce) Schimp.

Selected material studied: Alhama de Murcia, Sierra de Carrascoy, Rambla de la Tía Ginesa, 30SXG5089, 900 m, 26-II-1984, *Ros* (MUB 3971); Cehegín, Sierra Lavia, 30SXH1104, 950 m, 6-II-1982, *Ros & García Rowe* (MUB 676); Mula, Sierra del Cambrón, Pico La Selva, 30SXG1498, 1387 m, 7-XII-2002, *Cano* (MUB 14137). Humiferous soils.

Previous records: *Ros & Llimona* (1984); *Ros & Guerra* (1987).

***Brachythecium velutinum*** (Hedw.) Schimp. var. *velutinum*

Selected material studied: Lorca, Sierra del Gigante, 30SWG9077, 990 m, 15-IV-2002, *Cano* (MUB 12940); Mula, Sierra de Ponce (Sierra del Cambrón), Pico La Selva, 30SXH1598, 1100 m, 7-XI-1981, *Ros* (MUB 181); Moratalla, Sierra de los Álamos, Arroyo de la Celada, 30SWH9226, 1250 m, 2-V-2002, *Cano* (MUB 14092). Humiferous soils, calcareous rocks and base of trunks.

Previous records: *Ros & Llimona* (1984); *Ros & Guerra* (1987).

***Brachythecium velutinum* var. *salicinum*** (Schimp.) Mönk.

Selected material studied: Cehegín, Sierra Lavia, 30SXH1104, 950 m, 6-II-1982, *Ros & García Rowe* (MUB 675); Mula, Sierra de Ponce (Sierra del Cambrón), Pico La Selva, 30SXH1598, 1100 m, 7-XI-1981, *Ros* (MUB 182); Moratalla, Macizo de Revolcadores, pr. Pico El Obispo, 30SWH6514, 1900 m, 7-III-2004, *Cano* (MUB 16671); Totana, Sierra Espuña, El Morrón, 1500 m, *Allorge & Allorge* (PC). Humiferous soils, calcareous rocks or soil accumulated on rocks.

Previous records: *Ros & Llimona* (1984); *Ros & Guerra* (1987) sub *Brachythecium velutinum* subsp. *salicinum*.

***Bryoerythrophyllum recurvirostrum*** (Hedw.) P.C. Chen

Studied material: Moratalla, Macizo de Revolcadores, pr. Pico El Obispo, 30SWH6514, 1900 m, 7-III-2004, *Cano* (MUB 16668); Moratalla, Sierra de Villafuerte, Fuente de Cantalar, 30SWH7423, 1500 m, 17-V-2003, *Cano* (MUB 15280); Yecla, Sierra de Salinas, pr. Cerro Laurel, 30SXH7263, 1160 m, 27-IV-2003, *Cano* (MUB 15145). Ledges of calcareous rocks and soil under *Quercus rotundifolia*.

New record for Murcia. A species widely recorded in the Iberian Peninsula, but uncommon in the south of Spain, although it has been reported from Albacete (*Guerra et al.* 1989), Alicante (*Cano et al.* 1996) and Almería (*García-Zamora et al.* 1998).

***Bryum argenteum*** Hedw. var. *argenteum*

Selected material studied: Caravaca de la Cruz, huerta de Caravaca de la Cruz, Río Argos, 30SWH9916, 27-XI-1981, *Alcaraz et al.* (MUB 349); Jumilla, Sierra del Carche, Pico del Carche, 30SXH6055, 2-V-1980, *Alcaraz & Llimona* (MUB 120). On soil and soil accumulated on rocks, frequent in disturbed areas.

Previous records: *Alcaraz et al.* (1982); *Ros & Llimona* (1984); *Ros & Guerra* (1987); *Rams et al.* (2000).

***Bryum argenteum* var. *lanatum*** (P. Beauv.) Bruch & Schimp.

Studied material: San Pedro del Pinatar, 30SXG9689, 17-XII-1982, *Ros* (MUB 3153). Sandy soil.

Previous records: *Guerra & Puche* (1984); *Ros & Guerra* (1987).

***Bryum caespiticium*** Hedw.

Selected material studied: Alhama de Murcia, Sierra de Carrascoy, Rambla de la Tía Ginesa, 30SXG5089, 900 m, 26-II-1984, *Ros* (MUB 3417); Bullas, Río Mula, Salto Lucero (Usero), 30SXH1709, 600 m, 5-XI-1978, *Egea* (MUB 355). On soil and soil covered rocks, close to stream.

Previous records: *Ros & Llimona* (1984); *Ros & Guerra* (1987).

***Bryum dichotomum*** Hedw.

Selected material studied: Bullas, El Carrascalejo, 30SXH1313, 600 m, 25-IV-1982, *Ros* (MUB 5529); Cartagena, carretera Portman-Los Belones, 30SXG9061, 50 m, 30-I-1990, *Ros* (MUB 121); Lorca, Sierra de la Almenara, castillo de Lorca, 30SXG1471, 400 m, 3-III-1984, *Ros* (MUB 3951); Mazarrón, Fuente de Meca, 30SXG4361, 250 m, 10-III-1984, *Ros* (MUB 2840); San Pedro del Pinatar, Salinas de Cotorrillo, 30SXG9689, 0 m, 17-XII-1982, *Ros* (MUB 3146). On soil and soil accumulated on rocks, frequent in disturbed areas.

Previous records: *Alcaraz et al.* (1982) sub *Bryum bicolor* and *B. versicolor*; *Guerra & Puche* (1984) sub *Bryum dunense*; *Ros & Llimona* (1984) sub *Bryum bicolor*; *Ros & Guerra* (1987) sub *Bryum bicolor*; *B. dunense* and *Bryum versicolor*; *Sánchez-Moya & Cano* (1999) sub *Bryum bicolor* and *B. dunense*; *Rams et al.* (2000) sub *Bryum bicolor*.

***Bryum gemmilucens*** R. Wilczek & Demaret

Selected material studied: Bullas, El Aceniche, 30SXH1305, 820 m, 5-II-1983, *Ros* (MUB 3478); Moratalla, Sierra de los Álamos, Puerta de Moratalla, Río Benamor, 30SWH9130, 700 m, 18-XII-1983, *Ros* (MUB 3755). On bare soils.

Previous records: *Ros & Guerra* (1987, 1988).

***Bryum klinggraeffii*** Schimp.

Studied material: Puerto Lumbreras, Sierra de Enmedio, Cabezo La Jara, 30SXG9756, 800 m, 19-XII-1982, *Ros* (MUB 3624). Soil under *Quercus rotundifolia*.

Previous records: *Ros & Guerra* (1987, 1988).

***Bryum pseudotriquetrum*** (Hedw.) P. Gaertn., B. Mey & Scherb.

Selected material studied: Moratalla, Sierra de los Álamos, cortijo Somogil, Arroyo Hondares, 30SWH9030, 700 m, 19-III-1984, *Ros* (MUB 3300); Moratalla, Sierra de Villafuerte,

30SWH7223, 1200 m, 26-IV-2002, *Ros et al.* (MUB 15030). Banks with seeping water, sometimes partially submerged.

Previous record: Ros & Guerra (1987).

***Bryum radiculosum*** Brid.

Selected material studied: Lorca, Lomo de Bas, 30SXG3255, 300 m, 10-III-1984, *Ros* (MUB 3275); Moratalla, Sierra de los Álamos, Cenajo del Agua Cernida, 30SWH8829, 900 m, 19-III-1984, *Ros* (MUB 3310); Murcia, Jardín El Salitre, *Rams* (MUB 10441). Murcia, Fuensanta, 22-III-1960, *Runbgy* (C); San Javier, Isla Grosa, 30SXG0278, 6-V-1983, *Ros* (MUB 2886); Totana, Sierra Espuña, Valle del Leiva, 30SXG2890, 1100 m, 12-II-1984, *Ros* (MUB 3455). Rocks and banks with accumulated soil.

Previous records: Casas (1973) sub *Bryum murorum*; Ros & Guerra (1987); Rams et al. (2000).

***Bryum tenuisetum*** Limpr.

Studied material: Murcia, Barrio de San Andrés, X-1997, *Rams & Ibernón* (MUB 10421). Nitrified soil.

Previous record: Rams et al. (2000).

***Campylostelium pitardii*** (Corb.) E. Maier

Selected material studied: Cartagena, Sierra de la Muela, Cuestas del Cedacero, Cabezo del Cambrón, 30SXG6362, 300 m, 1-IV-1984, *Ros* (MUB 1201); Murcia, El Valle, 30-III-2003, *Cano* (MUB 15032); Murcia, Sierra de Columbares, 30SXH79, 200 m, 9-III-1985, *Ros* (MUB 3501). On open soils, occasionally gypsiferous soils.

Previous records: Casas (1973) sub *Grimmia pitardii*; Casas et al. (1985) sub *Grimmia pitardii*; Ros & Guerra (1987) sub *Grimmia pitardii*.

***Cratoneuron filicinum*** (Hedw.) Spruce

Selected material studied: Moratalla, Sierra de los Álamos, Cortijo del Manco, 30SXH9128, 1090 m, 2-V-2002, *Cano* (MUB 14108); Moratalla, Sierra de Villafuerte, Arroyo Blanco, 30SWH7423, 1100 m, 26-IV-2002, *Cano et al.* (MUB 15023). Moratalla, Benizar, Fuente de Benizar, 30SWH8836, 970 m, 11-IV-2003, *Cano* (MUB 15430). Banks and rocks at the edges of streams.

Previous records: Allorge & Allorge (1946); Ros & Llimona (1984); Gil & Ruiz (1985); Ros & Guerra (1987); Rams et al. (2000).

***Crossidium aberrans*** Holz. & E.B. Bartram

Selected material studied: Caravaca de la Cruz, carretera Caravaca de la Cruz-Lorca, Barranco Blanco, 30SWH9402, 900 m, *Ros* (MUB 3376); Jumilla, Sierra del Carche, Cerro de la Sal, 30SXH4360, 600 m, *Ros* (MUB 3139); Moratalla, Sierra de los Álamos, Cenajo del Agua Cernida, 30SWH8829, 1000 m, *Ros* (MUB 3206); Yecla, Arabí, 30SXH4984, 860 m, 17-XI-2002, *Cano* (MUB 14030). Screes, accumulated soil at the base of calcareous rocks and open soils.

Previous records: Ros & Guerra (1986, 1987).

***Crossidium crassinerve*** (De Not.) Jur.

Selected material studied: Águilas, Cala Reona, 30SXG2339, 10-III-1984, *Ros* (MUB 3128); Lorca, Sierra de la Torrecilla, Cabezo del Pino, Rambla del Pino, 30SXG1369, 400 m, 3-III-1984, *Ros* (MUB 3941); Murcia, Sierra Altaona, 30SXG7600, 395 m, *Cano* (MUB 16686); Murcia, El Ranero, IV-1997, *Rams* (MUB 10430); Murcia, Puerto de la Cadena, 30SXG6197, 200m, *Ros* (MUB 3749); Puerto Lumbreras, Cabezo de la Jara, 30SWG9655, 1150 m, 1-II-2004, *Cano* (MUB 16055); Las Torres de Cotillas, Los Pulpites, W de la urbanización Los Romeros, 20-IV-2002, *Werner* (MUB 12968); entre Calasparra y Caravaca de la Cruz, *Casas* (BCB 12164); entre Yecla y Calasparra, *Casas* (BCB 1488). Screes, accumulated soil at the base of calcareous rocks and bare soils.

Previous records: Casas (1973) sub *Crossidium chloronotos*; Alcaraz et al. (1982); Fuertes (1983); Ros & Llimona (1984); Casas (1986); Ros & Guerra (1987); Guerra et al. (1993); Sánchez-Moya & Cano (1999); Rams et al. (2000); Pócs et al. (2004) sub *Crossidium laxefilamentosum*.

***Crossidium laevipilum*** Thér. & Trab.

Studied material: Lorca, Zarcilla de Ramos, Rambla de los Chillidos, 28-II-2003, *Guerra* (MUB 15579); Murcia, Sierra del Puerto, carretera Murcia-San Javier, 30SXG7091, 180 m, 18-II-1984, *Ros* (MUB 3133). Bare soils.

New record for Murcia. The species is known from Northern Africa, Spain, Israel and Jordan (Cano et al. 1993). In Spain it has been reported from Albacete (Guerra et al. 1993), Huesca, Tarragona (Casas et al. 1993) and Alicante (Cano et al. 1996).

***Crossidium squamiferum*** (Viv.) Jur.

Selected material studied: Alhama de Murcia, Sierra Espuña, Valle de Leiva, 30SXG3293, 750 m,

20-V-1984, *Ros* (MUB 3207); Lorca, Sierra del Gigante, 30SWG9077, 990 m, 15-IV-2002, *Cano* (MUB 12939); Puerto Lumbreras, Cabezo de la Jara, 30SWG9655, 1150 m, 1-II-2004, *Cano* (MUB 16057). Talus, accumulated soil on calcareous rocks and open soils.

Previous records: Allorge & Allorge (1946); Ros & Llimona (1984); Ros & Guerra (1987).

***Ctenidium molluscum*** (Hedw.) Mitt.

Selected material studied: Jumilla, Sierra del Carche, Umbría del Mosquito, 30SXH 6056, 1000 m, 1-V-1981, *Ros* (MUB 3197); Moratalla, Rincón de los Huertos, 30SWH8234, 1265 m, 2-V-2002, *Cano* (MUB 14053); Moratalla, Sierra de los Álamos, Arroyo de la Celada, 30SWH9226, 1350 m, 2-V-2002, *Cano* (MUB 14084). On calcareous rocks.

Previous records: Allorge & Allorge (1946); Ros & Llimona (1984); Ros & Guerra (1987).

***Dicranella heteromalla*** (Hedw.) Schimp.

Selected material studied: La Unión, Monte Sancti Spiritu, 30SXG8864, 350 m, 10-III-1998, *Sánchez-Moya* (MUB 15082). Soil on slate rocks.

Previous record: Sánchez-Moya & Cano (1999).

***Dicranella howei*** Renauld & Cardot

Selected material studied: Blanca, entrada a Blanca, 30SXH4227, 200 m, *Ros* (MUB 3350); Bullas, El Carrascalejo, 30SXH1313, 600 m, 24-XI-1981, *Ros* (MUB 335); Cehegín, Sierra de Burete, Rambla de Enmedio, 30SXH1013, 600 m, *Ros* (MUB 1667); Moratalla, Sierra de los Álamos, Arroyo de la Rogativa, 30SWH6825, 1100 m, 21-V-1983, *Ros* (MUB 2911); entre Calasparra y Caravaca de la Cruz, 21-II-1973, *Casas* (BCB 12152). Open soils.

Previous records: Alcaraz et al. (1982); Ros & Llimona (1984); Ros & Guerra (1987); Sánchez-Moya & Cano (1999); Rams et al. (2000).

This species was reported under the genus *Anisothecium* Mitt. by Alcaraz et al. (1982), Ros & Llimona (1984) and Ros & Guerra (1987). Apparently this combination was never formally published.

***Didymodon acutus*** (Brid.) K. Saito

Selected material studied: Bullas, El Carrascalejo, 30SXH1313, 500 m, 31-I-1981, *Ros et al.* (MUB 367); Bullas, NE del Aceniche, 30SXH1306, 850 m, 6-II-1982, *Ros & García Rowe* (MUB 365); Lorca, Sierra de la Torrecilla, pr. ermita de los Navarros, 30SXG0068, 735 m, 11-V-2002, *Cano* (MUB 13013);

Moratalla, Sierra de la Muela, 30SWH8835, 1280 m, 11-IV-2003, *Jiménez* (MUB 15424). Soils on schists or calcareous rocks and open soils.

Previous records: Ros & Llimona (1984); Ros & Guerra (1987).

***Didymodon australasiae*** (Hook. & Grev.) R.H. Zander

Selected material studied: Caravaca de la Cruz, Fuente del Marqués, 30SWH9818, 650 m, 11-III-1989, *Sánchez & Marín* (MGC 715); Lorca, Sierra de la Torrecilla, Cabezo del Pino, Rambla del Pino, 30SXG1369, 400 m, 3-III-1984, *Ros* (MUB 1206); Moratalla, Benizar, Rincón de las Cuevas, 30SWH8835, 950 m, 11-IV-2003, *Cano et al.* (MUB 15422); Murcia, Jardín del Malecón, IX-1997, *Rams* (MUB 10434); Puerto Lumbreras, Sierra de Enmedio, cerca de las Pocicas, 30SXG0855, 450 m, 19-XII-1982, *Ros* (MUB 1203). Open soils.

Previous records: Guerra & Ros (1987) sub *Didymodon aaronis* and *D. trivialis*; Rams et al. (2000); Jiménez (2004).

According to Jiménez (2004), *Didymodon aaronis* and *D. trivialis* are heterotypic synonyms of *D. australasiae*.

***Didymodon fallax*** (Hedw.) R.H. Zander

Selected material studied: Alhama de Murcia, Sierra Espuña, Valle de Leiva, 30SXG3293, 1200 m, 13-XI-1983, *Ros* (MUB 3210); Cartagena, Sierra de la Muela, Fuente de la Muela, 30SXG6861, 500 m, *Ros* (MUB 782); Cehegín, Sierra Lavia, 30SXH1104, 950 m, *Ros & García Rowe* (MUB 373); Jumilla, Sierra del Carche, Solana de la Omblanquilla, 30SXH5856, *Ros* (MUB 3342); Mula, Sierra de Ponce (Sierra del Cambrón), Pico La Selva, 30SXH1598, *Ros* (MUB 368); Ricote, Sierra de Ricote, Rambla de Ambroz, 30SXH4025, 300 m, *Ros & Werner* (MUB 9708). Open soils.

Previous records: Ade & Koppe (1942) sub *Barbula fallax*; Ros & Llimona (1984); Ros & Guerra (1987); Sánchez-Moya & Cano (1999).

***Didymodon insulanus*** (De Not.) M.O. Hill

Selected material studied: Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13052); Moratalla, Rincón de los Huertos, 30SWH8233, 1280 m, 2-V-2002, *Cano* (MUB 14066); Mula, Sierra de Ponce (Sierra del Cambrón), Pico La Selva, 30SXH1595, 1100 m, 9-IV-1981, *Ros* (MUB 199). On calcareous rocks and accumulated soil on rocks.



Previous records: Ros & Llimona (1984); Ros & Guerra (1987); Rams et al. (2000).

***Didymodon luridus*** Hornch. ex Spreng.

Selected material studied: Alhama de Murcia, Sierra Espuña, Valle de Leiva, 30SXG3293, 750 m, 20-V-1984, *Ros* (MUB 3287); Cartagena, Cabezo La Panadera, Rambla del Cañar, I-2000, *Martínez* (MUB 10245); Cehegín, Sierra de Burete, 30SXH0910, 900-1000 m, 7-II-1982, *Ros & García Rowe* (MUB 364). On calcareous rocks and open soils.

Previous records: Casas (1973) sub *Didymodon trifarius*; Ros & Llimona (1984) sub *Didymodon trifarius*; Ros & Guerra (1987) sub *Didymodon trifarius*; Rams et al. (2000).

***Didymodon rigidulus*** Hedw.

Selected material studied: Lorca, Sierra de la Torrecilla, Rambla del Hortillo, 30SXG0270, 700 m, 11-V-2002, *Cano* (MUB 13002); Murcia, Cresta del Gallo, 30SXH6701, 30-I-1981, *Ros & Cano* (MUB 7906); Yecla, Arabí, 30SXH4984, 860 m, 17-XI-2002, *Cano* (MUB 14033). Open soils.

Previous records: Rungby (1962) sub *Barbula rigidula*; Ros & Llimona (1984); Ros & Guerra (1987); Guerra et al. (1993); Sánchez-Moya & Cano (1999); Jiménez (2004).

***Didymodon sicculus*** M.J. Cano, Ros, García-Zamora & J. Guerra

Selected material studied: La Unión, Cabezo Rajao, 30SXG8565, 180 m, 22-III-1998, *Sánchez-Moya* (MUB 15088); Las Torres de Cotillas, urbanización Los Romeros, 20-IV-2002, *Ros* (MUB 12967); Murcia, La Albatallía, 15-III-2000, *Dengra* (MUB 10244). On open soils, mainly saline.

Previous records: Sánchez-Moya & Cano (1999); Rams et al. (2000).

***Didymodon tophaceus*** (Brid.) Lisa

Selected material studied: Bullas, El Carrascalejo, 30SXH1313, 500 m, 31-I-1981, *Ros* (MUB 209); Murcia, Jardín del Malecón, III-1999, *Rams* (MUB 10437); Pliego (Mula), Fuente de la Teja, 500 m, 3-I-1982, *Ros & Aboal* (MUB 536); Sierra de la Pila, 30SXH6038, 800 m, 17-VII-1979, *Alcaraz* (MUB 25). Talus with seeping water and banks by streams.

Previous records: Alcaraz et al. (1982); Ros & Llimona (1984); Ros & Guerra (1987); Rams et al. (2000).

***Didymodon vinealis*** (Brid.) R.H. Zander

Selected material studied: Alhama de Murcia, Sierra de Carrascoy, pr. repetidor T.V., 30SXG5290, 1050 m, 21-X-2001, *Cano* (MUB 11949); Bullas, Río Mula, Salto Lucero (Usero), 30SXH1709, 600 m, 11-III-1981, *Ros* (MUB 200); Cehegín, Sierra de Burete, Rambla de Enmedio, 30SXH1013, 600 m, *Ros* (MUB 2904); Lorca, Lomo de Bas, 30SXG3255, 300 m, 10-III-1984, *Ros* (MUB 3277); Moratalla, Sierra de la Muela, 30SWH8835, 1280 m, 11-IV-2003, *Jiménez* (MUB 15425); Mula, Sierra Espuña, Risco del Portillo, 30SXG2194, 12-V-2002, *Jiménez* (MUB 12973). Open soils, accumulated soils on calcareous rocks, once on base of *Quercus rotundifolia* trunk.

Previous records: Allorge & Allorge (1946) sub *Barbula vinealis*; Casas (1973) sub *Barbula vinealis*; Ros & Llimona (1984); Ros & Guerra (1987); Jiménez (2004).

***Distichium capillaceum*** (Hedw.) Bruch & Schimp.

Selected material studied: Jumilla, Sierra del Carche, Pico del Carche, 30SXH6055, 1370 m, 13-I-1983, *Ros* (MUB 3398); Moratalla, Sierra de los Álamos, Arroyo de la Celada, 30SWH9226, 1350 m, 2-V-2002, *Cano* (MUB 14090); Moratalla, Sierra de Villafuerte, Arroyo Blanco, 30SWH7423, 26-IV-2002, *Guerra et al.* (MUB 13809). Fissures of calcareous rocks.

Previous record: Ros & Guerra (1987).

***Ditrichum flexicaule*** (Schwägr.) Hampe

Selected material studied: Moratalla, Sierra de Villafuerte, Arroyo Blanco, 30SWH7423, 1100 m, 26-IV-2002, *Cano et al.* (MUB 14242); Yecla, Sierra de Salinas, pr. Cerro Laurel, 30SXH7263, 1160 m, 27-IV-2003, *Cano* (MUB 15142). Fissures and ledges of calcareous rocks.

Previous records: Ros & Llimona (1984); Ros & Guerra (1987) sub *Ditrichum flexicaule* f. *densum* (Bruch & Schimp.) Mönk. and *Ditrichum flexicaule*; Casas et al. (1992).

The specimens from Murcia fit the main characters of *Ditrichum flexicaule* s. str.

***Encalypta streptocarpa*** Hedw.

Selected material studied: Moratalla, Rincón de los Huertos, 30SWH8233, 1280 m, 2-V-2002, *Cano* (MUB 14069); Moratalla, Sierra de Moratalla, Pico Revolcadores, Barranco del Rey, 30SWH6411, 950 m, 13-I-1983, *Ros* (MUB 2961). Fissures, ledges and sheltered talus of calcareous rocks.

Previous records: Allorge & Allorge (1946) sub *Encalypta contorta*; Ros & Guerra (1987).

***Encalypta vulgaris*** Hedw.

Selected material studied: Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13059); Yecla, Sierra de Salinas, pr. Cerro Laurel, 30SXH7263, 1160 m, 27-IV-2003, *Cano* (MUB 15147). Soil, ledges, fissures and talus on calcareous rocks.

Previous records: Alcaraz et al. (1982); Casas (1973); Ros & Llimona (1984); Ros & Guerra (1987); Sánchez-Moya & Cano (1999).

***Entosthodon attenuatus*** (Dicks.) Bryhn

Selected material studied: Cartagena, carretera Cartagena-Los Urrutias, 30SXG8876, 0 m, 27-III-1997, *Ros & Schumacker* (MUB 7903). On open soils.

Previous records: Ros & Guerra (1987, 1988).

***Entosthodon convexus*** (Spruce) Brugués

Studied material: La Unión, Monte Sancti Spiritu, cuesta de las Lajas, 30SXG8864, 200 m, 25-IV-2004, *Cano & Sánchez-Moya* (MUB 15082). Soil on slate rocks.

New record for Murcia. According to Brugués (2003), it is a common species in the Mediterranean area of Portugal and Spain on acidic and basic substrates.

***Entosthodon durieui*** Mont.

Selected material studied: Cartagena, Sierra de la Muela, subida a la Sierra, 30SXG6862, 200 m, 7-III-1984, *Ros* (MUB 3962); Lorca, Lomo de Bas, 30SXG3255, 300 m, 10-III-1984, *Ros* (MUB 2851). Open soils and talus on schists.

Previous records: Ros & Guerra (1987) sub *Entosthodon pallescens*; Brugués (1998).

***Entosthodon hungaricus*** (Boros) Loeske

Selected material studied: Cartagena, carretera Cartagena-Los Urrutias, 30SXG8876, 0 m, 27-III-1997, *Ros & Schumacker* (MUB 6713); Cartagena, Salinas del Rasall, Calblanque, 30SXG9964, 0 m, 6-III-1998, *Cano & Ros* (MUB 7202). Saline soils.

Previous records: Cano et al. (1999).

***Entosthodon pulchellus*** (H. Philib.) Brugués

Selected material studied: Cartagena, El Llano, cerca de Portmán, en la Sierra de Cartagena, *Esteve Chueca* (MA 3937); Moratalla, Benizar, Rincón de las Cuevas, 30SWH8835, 900 m, 11-IV-2003, *Guerra* (MUB 15603); Murcia, Jardín de Floridablanca, *Rams* (MUB 10417). Fissures and soil accumulated on calcareous rocks.

Previous records: Ros & Guerra (1987) sub *Funaria pulchella*; Casas et al. (1996) sub *Funaria pulchella*; Rams et al. (2000) sub *Funaria pulchella*.

***Epipterygium tozeri*** (Grev.) Lindb.

Studied material: La Unión, Monte Sancti Spiritu, 30SXG8864, 350 m, 10-III-1998, *Sánchez-Moya* (MUB 15079). Soil on slate rocks.

Previous record: Sánchez-Moya & Cano (1999).

***Eucladium verticillatum*** (Brid.) Bruch & Schimp.

Selected material studied: Bullas, Río Mula, Salto Lucero (Usero), 30SXH1709, 600 m, 6-III-1981, *Larios & Ros* (MUB 215); Caravaca de la Cruz, Archivel, Las Oicas, Río Argos, 30SWH8915, 800 m, 18-III-1984, *Ros* (MUB 3187); Moratalla, Sierra de Villafuerte, Arroyo Blanco, 30SWH7423, 1100 m, 26-IV-2002, *Cano et al.* (MUB 15022). Talus with seeping water and soil banks along streams.

Previous records: Alcaraz et al. (1982); Ros & Llimona (1984); Ros & Guerra (1987).

***Eurhynchium hians*** (Hedw.) Sande Lac. var. *hians*

Selected material studied: Calasparra, confluencia Río Benamor con el Segura, 15-IX-1991, *Ríos* (MUB 5974); Murcia, Jardín La Seda, *Rams* (MUB 10426). Stream banks.

Previous records: Ros & Guerra (1987); Rams et al. (2000).

***Eurhynchium hians*** var. *rigidum* (Boulay) J.-P. Frahm

Studied material: Sierra Espuña, prés de l'hotel, 950 m, IV-1935, *Allorge & Allorge* (PC). Calcareous talus.

Previous record: Allorge & Allorge (1946) sub *Oxyrhynchium swartzii* var. *meridionale*.

***Eurhynchium meridionale*** (Bruch & Schimp.)

De Not.

Selected material studied: Cartagena, Sierra de la Muela, pr. Pico La Muela, 540 m, 11-I-2004, *Cano* (MUB 15955); Cehegín, Sierra Lavia, 30SXH1104, 950 m, 6-II-1982, *Ros* (MUB 403); Cieza, Cañón de Almadenes, 30SXH2633, 200 m, *Cano et al.* (MUB 15699); Jumilla, Sierra del Carche, Pico del Carche, 30SXH6055, 900-1300 m, 9-XII-1983, *Ros* (MUB 3224); Moratalla, Sierra de los Álamos, Arroyo de la Celada, 30SWH9226, 1350 m, 2-V-2002, *Cano* (MUB 14088). On ledges or on calcareous rocks.

Previous records: Alcaraz et al. (1982); *Ros & Llimona* (1984); *Ros & Guerra* (1987).

***Eurhynchium pulchellum*** (Hedw.) Jenn.

Selected material studied: Cehegín, La Lavia, 30SXH1104, 6-II-1982, 950 m, *Ros & García Rowe* (MUB 457). On submerged trunk of *Ulmus minor* Mill. and on pine cone.

Previous record: *Ros & Llimona* (1984).

***Eurhynchium speciosum*** (Brid.) Jur.

Selected material studied: Caravaca de la Cruz, Archivel, Fuentes del Marqués, 30SWH9818, 800 m, 19-VI-1982, *Ros* (MUB 858); Cieza, Salto Almadenes (MUB 891). Soil accumulated at the edge of irrigation channels and soil accumulated on rocks with seeping water, once on stump of *Ulmus minor*.

Previous records: *Ros & Llimona* (1984); *Ros & Guerra* (1987).

***Fabronia pusilla*** Raddi

Selected material studied: Mula, Sierra Espuña, Risco del Portillo, 30SXG2194, 800 m, 12-V-2002, *Jiménez* (MUB 12972). Base of trunks of *Pinus* sp. and *Pistacia terebinthus* L.

Previous records: *Ros & Llimona* (1984); *Casas et al.* (1985).

***Fissidens bryoides*** Hedw.

Selected material studied: Abarán, Sierra de la Pila, Barranco de las Cabras, 30SXH5337, 700 m, 22-I-1984, *Ros* (MUB 3426); Cartagena, Los Belones, Cabezo de la Fuente, 30SXG9665, 100 m, 29-XII-1983, *Ros* (MUB 3757); Lorca, Lomo de Bas, 30SXG3255, 300 m, 10-III-1984, *Ros* (MUB 2844). Soil in fissures or on talus of rocks and open soils.

Previous records: *Ros* (1984) sub *Fissidens incurvus*; *Ros & Guerra* (1985) sub *Fissidens viridulus*; *Ros & Guerra* (1987, 1988) sub *Fissidens*

*incurvus*, *Fissidens viridulus* and *F. viridulus* var. *bambergeri*; *Sánchez-Moya & Cano* (1999).

***Fissidens crassipes*** subsp. ***warnstorffii*** (M. Fleisch.) Brugg.-Nann.

Selected material studied: Bullas, Río Mula, Reclín de Abajo, 30SXH2010, 520 m, 6-II-1983, *Ros* (MUB 2922); Bullas, Río Mula, Salto Lucero (Usero), 30SXH1709, 600 m, 8-XI-1981, *Ros* (MUB 408); Caravaca de la Cruz, Archivel, Río Argos, 30SWH9916, 600 m, 8-I-1983, *Ros* (MUB 3397); Cieza, Cañón de Almadenes, 30SXH2633, 200 m, 2-11-2003, *Cano et al.* (MUB 15699). On banks and on rocks of streams and at the edge of irrigation channels.

Previous records: *Allorge & Allorge* (1946) sub *Fissidens warnstorffii*; *Gil & Ruiz* (1985); *Ros & Guerra* (1987) sub *Fissidens crassipes* and sub *F. crassipes* var. *philibertii*.

***Fissidens dubius*** P. Beauv.

Selected material studied: Alhama de Murcia, Sierra Espuña, Río Espuña, 30SXG2791, 1200 m, 12-II-1984, *Ros* (MUB 4196); Cehegín, Sierra Lavia, 30SXH1104, 950 m, 6-II-1982, *Ros & García Rowe* (MUB 701); Jumilla, Sierra del Carche, Pico El Carche, 30SXH6055, 1000 m, 13-I-1983, *Ros* (MUB 3386); Moratalla, Sierra de Villafuerte, Arroyo Blanco, 30SWH7423, 1100 m, 26-IV-2002, *Cano et al.* (MUB 15034). Fissures, ledges and sheltered talus of calcareous rocks.

Previous records: *Alcaraz et al.* (1982) sub *Fissidens cristatus*; *Ros & Llimona* (1984) sub *Fissidens cristatus*; *Ros & Guerra* (1987) sub *Fissidens cristatus*.

***Fissidens grandifrons*** Brid.

Selected material studied: Alhama de Murcia, Sierra Espuña, Río Espuña, 30SXG2791, 1000 m, 31-I-1982, *Ros* (MUB 3533); Caravaca de la Cruz, Fuente del Marqués, 30SWH9718, 800 m, 19-VI-1982, *Ros* (MUB 763); Sierra Espuña, 15-IV-1935, *Allorge & Allorge* (PC). Submerged in clean water.

Previous records: *Potier de la Varde* (1945); *Allorge & Allorge* (1946); *Gil & Ruiz* (1985); *Ros & Guerra* (1987).

***Fontinalis antipyretica*** Hedw.

Selected material studied: Cehegín, Río Argos, *Aboal* (MUB 13771). Submerged in clean water.

Previous records: *Gil & Ruiz* (1985); *Ros & Guerra* (1987).

***Fontinalis duriaei*** Schimp.

Selected material studied: Calasparra, Cañaverosa, 30SXH1335, 10-VII-2002, *Sánchez-Fernández* (MUB 16207); Moratalla, Río Benamor, Puerta de Moratalla, 30SWH9030, 700 m, 24-I-1981, *Selma & López* (MUB 640). Submerged in clean water.

Previous records: Ros & Guerra (1985, 1987) sub *Fontinalis hypnoides* var. *duriaei*.

***Funaria hygrometrica*** Hedw.

Selected material studied: Bullas, El Carrascalejo, 30SXH1313, 600 m, 25-IV-1982, *Ros* (MUB 722); Murcia, La Herrera, huerta de Murcia, 30SXH6304, 50 m, 21-III-1979, *Alcaraz* (MUB 84); Moratalla, Sierra de Villafuerte, pr. Fuente de Cantalar, 30SXH7222, 1400 m, 8-V-2004, *Cano* (MUB 16880). Nitrified soils.

Previous records: Alcaraz et al. (1982); Ros & Llimona (1984); Ros & Guerra (1987); Rams et al. (2000).

***Funariella curviseta*** (Schwägr.) Sérgio

Selected material studied: Cartagena, Los Belones, Cabezo de la Fuente, 30SXG9665, 11-III-2000, *Murcia* (MUB 10248). Ledges and fissures of rocks.

Previous records: Allorge & Allorge (1946) sub *Funaria curviseta*; Ros & Guerra (1987, 1988) sub *Enthostodon curvisetus*.

***Gigaspermum mouretii*** Corb.

Studied material: Cartagena, Cabo Tiñoso, pr. Campillo, 30SXG6359, 100 m, 25-III-1984, *Ros* (MUB 6359); Cartagena, Isla del Ciervo, 30SXG9970, 0 m, 20-II-1983, *Ros* (MUB 730). Open soils and accumulated soil between rocks.

Previous records: Ros (1984); Casas et al. (1985); Ros & Guerra (1987).

***Grimmia anodon*** Bruch & Schimp.

Selected material studied: Moratalla, Sierra de Moratalla, Pico Revolcadores, Barranco del Rey, 30SWH6411, 1700 m, 16-IV-1982, *Ros* (MUB 4000). Open soils and soil in fissures of rocks.

Previous record: Ros & Guerra (1987).

***Grimmia crinita*** Brid.

Selected material studied: Caravaca, Barranco Blanco, 30SWH9402, 900, 12-III-1997, *Ros & Schumacker* (MUB 11025); Yecla, Arabí, 30SXH4984,

860 m, 17-XI-2002, *Cano* (MUB 14038); entre Caudete y Yecla, 21-II-1973, *Casas* (BCB 2413). On calcareous and sandstone rocks.

Previous records: Ros & Guerra (1987); Casas et al. (1989).

***Grimmia dissimulata*** E. Maier

Studied material: Abanilla, Sierra de Quibas, 30SXH6441, 950 m, 9-III-2002, *Cano* (MUB 12768); Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13049); Moratalla, Rincón de los Huertos, 30SWH8233, 1280 m, 2-V-2002, *Cano* (MUB 14068); Mula, Sierra de Ponce (Sierra del Cambrón), Pico La Selva, 30SXH1598, 1100 m, 7-XI-1981, *Ros* (MUB 426); Puerto Lumbreras, Cabezo de la Jara, 30SWG9655, 1150 m, 1-II-2004, *Cano* (MUB 16056); Totana, Sierra Espuña, 30SXG2890, 1100 m, 12-II-1984, *Ros* (MUB 1209). On calcareous rocks.

New record for Murcia. This is a neglected widespread European species belonging to the *Grimmia lisae* De Not.-G. *trichophylla* Grev. complex, which was recently described by Maier (2002). According to Maier (2002) and Porley (2004), it is mainly characterized by a leaf base with 4 guide cells (in *G. lisae* the costa shows 6 guide cells or more), basal marginal cells shortly-rectangular, conspicuously nodulose in leaf base, and guide cells in leaf base arranged in one layer (in *G. trichophylla* the basal marginal cells are elongate-rectangular, not conspicuously nodulose in leaf base, and the guide cells in leaf base are arranged in two layers). Also *G. dissimulata* grows on calcareous substrates and *G. trichophylla* and *G. lisae* mainly on acidic rocks and more rarely on basic rocks.

***Grimmia laevigata*** (Brid.) Brid.

Studied material: Lorca, pr. Cortijo del Tío Penón, 30SWG9571, 650 m, 15-IV-2002, *Cano* (MUB 12933); Lorca, Sierra de la Torrecilla, Rambla del Hortillo, 30SXG0372, 600 m, 3-III-1984, *Ros* (MUB 1210). On acidic rocks.

Previous record: Ros & Guerra (1988).

***Grimmia orbicularis*** Bruch ex Wilson

Selected material studied: Abanilla, Sierra de Quibas, 30SXH6441, 950 m, 9-III-2002, *Cano* (MUB 12758); Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13057); Lorca, Sierra del Gigante, 30SWG9077, 990 m, 15-IV-2002, *Cano* (MUB 12937); Moratalla, Sierra de la Muela, 30SWH8934, 1280 m, 11-IV-

2003, *Cano* (MUB 15428); Yecla, Sierra de Salinas, pr. Cerro Laurel, 30SXH7263, 1160 m, 27-IV-2003, *Cano* (MUB 15143). On exposed calcareous or acidic rocks.

Previous records: Allorge & Allorge (1946); Alcaraz et al. (1982); Ros & Llimona (1984); Ros & Guerra (1987).

***Grimmia pulvinata*** (Hedw.) Sm.

Selected material studied: Alhama de Murcia, Sierra de Carrascoy, Rambla de Roy, 30SXG5190, 800 m, 27-II-1998, *Ros et al.* (MUB 15492); Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13046); Lorca, Sierra de la Torrecilla, Rambla del Hortillo, 30SXG0270, 700 m, 11-V-2002, *Cano* (MUB 13007). On exposed calcareous or acidic rocks.

Previous record: Ade & Koppe (1942); Casas (1973) sub *Grimmia pulvinata* var. *africana*; Alcaraz et al. (1982); Ros & Llimona (1984); Ros & Guerra (1987).

***Grimmia aff. tergestina*** Tomm. ex Bruch & Schimp.

Studied material: Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13048); Totana, Sierra Espuña, valle del Río Espuña, 30SXG2890, 1100 m, 12-II-1984, *Ros & Larios* (MUB 1211). On calcareous rocks.

Previous records: Ros & Guerra (1988).

The above mentioned samples were sterile, both being collected from calcareous rocks. They probably correspond to *G. tergestina*, although, according to Muñoz (1999), *G. tergestina* belongs to a complex of taxa that can only be confidently determined from sporophytic material.

***Gymnostomum calcareum*** Nees & Hornsch.

Selected material studied: Cartagena, Cabo Tiñoso, Peñas Blancas, Rambla del Cañar, 30SXG6062, 100 m, 1-IV-1984, *Ros* (MUB 3256); Moratalla, Benizar, Rincón de las Cuevas, 30SWH8835, 900 m, 11-IV-2003, *Guerra & Cano* (MUB 15602); Murcia, barrio de San Juan, *Rams* (MUB 10425). Talus with seeping water and wet rocks.

Previous records: Allorge & Allorge (1946); Ros & Llimona (1984); Ros & Guerra (1987); Rams et al. (2000).

***Gymnostomum lanceolatum*** M.J. Cano, Ros & J. Guerra

Selected material studied: Cartagena, Sierra de la Muela, subida a la Sierra, 30SXG6862, 200 m, 7-III-1983, *Ros* (MUB 3736); Moratalla, Sierra de Villafuerte, Arroyo Blanco, 30SWH7423, 1100 m, 26-IV-2002, *Guerra et al.* (MUB 13807). Talus and soil accumulated on rocks.

New record for Murcia. It was described from material from Almería and Alicante by Cano et al. (1994). Later, it was reported from Turkey and Croatia (Kučera 1998), Balearic Islands (Cano et al. 2001), Morocco (Jiménez et al. 2002), Greece (Blockeel et al. 2002) and Italy (Aleffi et al. 2004). After a revision of the Iberian specimens of the genus *Gymnostomum*, Guerra (2004) reported this species from numerous localities in the Iberian Peninsula, where it had been misidentified or overlooked. Moreover, he reported *G. lanceolatum* from Murcia, but no localities were indicated. Therefore, the above cited specimens from Murcia support the record for this species, which appears in «Flora Briofítica Iberica».

***Gymnostomum viridulum*** Brid.

Selected material studied: Bullas, NE del Aceniche, 30SXH1306, 780 m, 6-II-1982, *Ros & García Rowe* (MUB 429); Río Mula, Rambla Perea, 30SXH3215, 400 m, 25-III-1981, *Ros* (MUB 231). Talus, fissures and soil accumulated on rocks.

Previous records: Casas et al. (1985) sub *Gymnostomum luisieri*; Ros & Llimona (1984) sub *Gymnostomum luisieri*; Ros & Guerra (1987) sub *Gymnostomum luisieri*.

***Habrodon perpusillus*** (De Not.) Lindb.

Studied material: Alhama de Murcia, Sierra de Carrascoy, Rambla de Roy, 30SXG5190, 900 m, 2-IV-1996, *Cano & Ros* (MUB 6036). On trunk of *Quercus rotundifolia*.

Previous record: Ros et al. (1996).

***Hedwigia ciliata*** (Hedw.) P. Beauv.

Studied material: Bullas, Lomas de la Atalaya, 30SXH1310, 720 m, 1-XI-2003, *Cano et al.* (MUB 15697). Base of *Pinus halepensis* Mill.

New record for Murcia. In Southeastern Spain, it has been reported only in Albacete (Heras & Ros 1986).

***Homalothecium aureum*** (Spruce) H. Rob.

Selected material studied: Abarán, Sierra de la Pila, Barranco de Valcárcel, 30SXH5237, 700 m, 22-I-1984, *Ros* (MUB 2032); Cehegín, Sierra Lavia, 30SXH1104, 950 m, 6-II-1982, *Ros* (MUB 431); Lorca, Sierra de la Torrecilla, Rambla del Hortillo, 30SXG0270, 700 m, 11-V-2002, *Cano* (MUB 13008); Mula, Sierra de Quipar, Barranco del Aceniche, 30SXH1212, 840 m, 8-V-1981, *Ros* (MUB 237); Totana, Sierra Espuña, pr. Río Espuña, 30SXG2890, 850 m, 15-XI-1981, *Guirao* (MUB 644). Humiferous soils, mainly in *Quercus rotundifolia* formations.

Previous records: Allorge & Allorge (1946) sub *Camptothecium aureum*; Alcaraz et al. (1982); Casas et al. (1985); Ros & Llimona (1984); Ros & Guerra (1987).

***Homalothecium lutescens*** (Hedw.) H. Rob.

Selected material studied: Bullas, NE del Aceniche, 30SXH1306, 780 m, 6-II-1982, *Ros* & *García Rowe* (MUB 733); Cartagena, Sierra de la Muela, Fuente de la Muela, 30SXG6861, 500 m, 7-III-1984, *Ros* (MUB 3977); Mula, Sierra de Ponce (Sierra del Cambrón), Pico La Selva, 30SXH1598, 1200 m, 9-VI-1982, *Ros* (MUB 5517). Humiferous soils.

Previous records: Ros & Llimona (1984); Ros & Guerra (1987).

***Homalothecium sericeum*** (Hedw.) Schimp.

Selected material studied: Abanilla, Sierra de Quibas, 30SXH6441, 950 m, 9-III-2002, *Cano* (MUB 12764); Abarán, Sierra de la Pila, Cueva de la Excomuni3n, 30SXH5538, 4-III-1999, *Ros* (MUB 15552); Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1375 m, 2-V-2002, *Cano* (MUB 13054); Moratalla, Rinc3n de los Huertos, 30SWH8233, 1280 m, 2-V-2002, *Cano* (MUB 14064); Yecla, Arab3, 30SXH4984, 860 m, 17-XI-2002, *Cano* (MUB 14035). Calcareous rocks and base of trunk of *Quercus rotundifolia*.

Previous records: Allorge & Allorge (1946) sub *Homalothecium sericeum* f. *robustum*; Alcaraz et al. (1982); Ros & Llimona (1984); Ros & Guerra (1987).

***Hygroamblystegium tenax*** (Hedw.) Jenn.

Selected material studied: Moratalla, Sierra de Villafuerte, Arroyo Blanco, 30SWH7423, 1100 m, 26-IV-2002, *Cano et al.* (MUB 15027). Rocks in streams.

Previous records: Ros & Llimona (1984); Ros & Guerra (1987).

***Hymenostylium recurvirostrum*** (Hedw.) Dixon

Selected material studied: Alhama de Murcia, Sierra Espuña, Río Espuña, 30SXG2791, 900-1000 m, 30-I-1982, *Ros* (MUB 3996). Stream banks.

Previous records: Ros & Llimona (1984) sub *Gymnostomum recurvirostrum*; Ros & Guerra (1987) sub *Gymnostomum recurvirostrum*.

***Hypnum cupressiforme*** Hedw. var. *cupressiforme*

Selected material studied: Lorca, Sierra de la Torrecilla, Rambla del Hortillo, 30SXG0270, 700 m, 11-V-2002, *Cano* (MUB 13010). On rocks and soils.

Previous record: Ros & Guerra (1987).

***Hypnum cupressiforme*** var. *filiforme* Brid.

Selected material studied: Lorca, Sierra de Ponce, 30SXH0899, 1000 m, 9-V-1981, *Ros* (MUB 254). On trunk of *Quercus rotundifolia*.

Previous records: Allorge & Allorge (1946); Ros & Llimona (1984); Ros & Guerra (1987).

***Hypnum cupressiforme*** var. *lacunosum* Brid.

Selected material studied: Calasparra, 30SXH1735, 24-XI-1981, *Alcaraz* (MUB 870); Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13047); Fortuna, Sierra de La Pila, Rambla del Comisario, 30SXH5934, 800 m, 2-IV-1984, *Alcaraz* (MUB 16); Jumilla, Sierra del Carche, 30SXH6055, *Alcaraz* & *Llimona* (MUB 137); Lorca, Sierra de Ponce, 30SXH0899, 1000 m, 9-V-1981, *Ros* (MUB 255); Totana, Sierra Espuña, valle del Río Espuña, 30SXG3091, 800 m, *Alcaraz* (MUB 77). On rocks and calcareous soils.

Previous record: Ros & Llimona (1984) sub *Hypnum cupressiforme* var. *tectorum*.

This taxon is considered by some authors (Frahm 1976, Smith 1997) as a separate species [*Hypnum lacunosum* (Brid.) Brid.].

***Leptobarbula berica*** (De Not.) Schimp.

Selected material studied: Moratalla, Benizar, Rinc3n de las Cuevas, 30SWH8835, 900 m, 11-IV-2003, *Guerra* (MUB 15058). Calcareous walls.

Previous records: Ros & Guerra (1987, 1988).

***Leptodictyum humile*** (P. Beauv.) Ochyra

Selected material studied: Murcia, La Flota, 30SXH6507, 30 m, *Ros* & *Aboal* (MUB 648). At the edge of an irrigation channel.

Previous records: Ros & Guerra (1987, 1988) sub *Leptodictyum kochii*.

***Leptodictyum riparium*** (Hedw.) Warnst.

Selected material studied: Caravaca de la Cruz, Archivel, Fuentes del Marqués, 30SWH9818, 650 m, 19-VI-1982, Ros (MUB 3273). Submerged in irrigation channels.

Previous records: Ros & Llimona (1984); Ros & Guerra (1987).

***Leptodon smithii*** (Hedw.) F. Weber & D. Mohr

Selected material studied: Alhama de Murcia, Sierra de Carrascoy, Rambla de Roy, 30SXG5190, 1000 m, 4-XII-1983, Ros (MUB 890); Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1375 m, 2-V-2002, Cano (MUB 13055); Fortuna, Sierra de la Pila, Pico Los Cenajos, 30SXH5737, 1200 m, 24-I-1981, Ros (MUB 846); Jumilla, Sierra del Carche, base del Pico El Carche, 30SXH6055, 1000 m, 1-V-1981, Ros (MUB 158); Moratalla, Sierra de los Álamos, Arroyo de la Celada, 30SWH9226, 1350 m, 2-V-2002, Cano (MUB 14085). Calcareous rocks and epiphytic on trunks of *Juniperus oxycedrus* L. and *Quercus rotundifolia*.

Previous records: Allorge & Allorge (1946); Alcaraz et al. (1982); Ros & Llimona (1984); Ros & Guerra (1987); Casas et al. (1992).

***Leptophascum leptophyllum*** (Müll. Hal.) J. Guerra & M.J. Cano

Studied material: Murcia, Jardín La Seda, Rams & Imbernón (MUB 10427). Nitrified soil.

Previous records: Casas & Brugués (1995) sub *Phascum leptophyllum*; Rams et al. (2000); Guerra (2003).

***Leucodon sciuroides*** (Hedw.) Schwägr. var. *sciuroides*

Selected material studied: Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1375 m, 2-V-2002, Cano (MUB 13056); Jumilla, Sierra del Carche, 30SXH6055, 1300 m, 1-V-1981, Ros (MUB 160); Moratalla, Rincón de los Huertos, 30SWH8233, 1280 m, 2-V-2002, Cano (MUB 14062); Mula, Sierra de Ponce (Sierra del Cambrón), Pico La Selva, 30SXH1598, 19-IV-1982, Ros (MUB 730); Yecla, Sierra de Salinas, pr. Cerro Laurel, 30SXH7263, 1160 m, 27-IV-2003, Cano (MUB 15146). Calcareous rocks and epiphytic on trunk of *Quercus rotundifolia*.

Previous records: Ros & Llimona (1984); Ros & Guerra (1987); Fuertes et al. (1997).

***Leucodon sciuroides*** var. *morensis* (Schwägr.) De Not.

Selected material studied: Abarán, Sierra de La Pila, collado de Los Perdiñales, 30SXH5437, 800 m, 3-IV-1980, Alcaraz (MUB 14); Jumilla, Sierra del Carche, 30SXH6055, 1360 m, 2-V-1980, Alcaraz & Llimona (MUB 140); Yecla, Sierra de Salinas, junto cueva el Lagrimal, 25-IV-1981, Díaz (MUB 844). Calcareous rocks.

Previous records: Alcaraz et al. (1982); Ros & Guerra (1987); Fuertes et al. (1997).

***Microbryum curvicolle*** (Hedw.) R.H. Zander

Selected material studied: Moratalla, Sierra de los Álamos, Cenajo del Agua Cernida, 30SWH8829, 1000 m, 30-IV-1983, Ros (MUB 1299); Moratalla, pr. Sabinar, 30SWH7528, 26-IV-2002, Ros et al. (MUB 13774); Murcia, El Valle, 30SXH6300, 100 m, 30-I-1998, Ros & Cano (MUB 15406). Open soils.

Previous records: Casas (1973) sub *Phascum curvicolle*; Ros & Llimona (1984) sub *Phascum curvicolle*; Ros & Guerra (1987) sub *Phascum curvicolle*; Casas et al. (1989) sub *Phascum curvicolle*; Carrión et al. (1990) sub *Phascum curvicolle*; Guerra et al. (1991) sub *Phascum curvicolle*.

***Microbryum davallianum*** (Sm.) R.H. Zander

Selected material studied: Cartagena, Playa Honda, 30SYG0067, 0 m, 2-II-1992, Ros & Werner (MUB 4493); Moratalla, Sierra de los Álamos, Cenajo del Agua Cernida, 30SWH8829, 900 m, 16-III-1985, Ros (MUB 4245); Moratalla, Sierra de Villafuerte, Arroyo Blanco, 30SWH7423, 1100 m, 26-IV-2002, Cano et al. (MUB 15026). Open soils.

Previous records: Casas (1973) sub *Pottia davalliana*; Ros & Llimona (1984) sub *Pottia starckeana* subsp. *conica*; Ros & Guerra (1985, 1987) sub *Pottia commutata*, *Pottia starckeana* subsp. *conica* and *Pottia starckeana* subsp. *minutula*.

***Microbryum floerkeanum*** (F. Weber & D. Mohr) Schimp.

Selected material studied: San Javier, carretera Cartagena-Alicante, cruce a Los Narejos, 30SXG9084, 0 m, 2-III-1985, Ros (MUB 2980); Lorca, Los Cautivos, 30SXG0474, 500 m, 3-III-1984, Ros (MUB 2978). On open soils, sometimes gypsiferous.

Previous records: Ros & Guerra (1987, 1988) sub *Phascum floerkeanum*.

***Microbryum starkeanum*** (Hedw.) R.H. Zander

Selected material studied: Águilas, Cabo Cope, 130 m, 16-III-2003, *Cano* (MUB 14979); Cartagena, Sierra de la Muela, Pico La Muela, 540 m, 11-I-2004, *Cano* (MUB 15952); Embalse de Santomera, 22-II-1987, *Ros* (MUB 5338); Murcia, El Valle, 30SXH6300, 100 m, 30-I-1998, *Ros & Cano* (MUB 15404). Open soils.

Previous records: Casas (1973) sub *Pottia starkeana*; Ros & Guerra (1987) sub *Pottia mutica*; Rams et al. (2000) sub *Pottia starkeana*.

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

Selected material studied: Alhama de Murcia, Sierra de Carrascoy, repetidor T.V., 30SXG5290, 1050 m, 21-X-2001, *Cano* (MUB 11947); Bullas, Sierra de Burete, 30SXH1009, 780 m, 8-XII-2002, *Cano* (MUB 14140); Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13068, 13070); Moratalla, Rincón de los Huertos, 30SWH8233, 1280 m, 2-V-2002, *Cano* (MUB 14074); Moratalla, Sierra de los Álamos, Arroyo de la Celada, 30SWH9226, 1250 m, 2-V-2002, *Cano* (MUB 14103); Mula, Sierra del Cambrón, Pico La Selva, 30SXG1498, 1387 m, 7-XII-2002, *Cano* (MUB 14134, MUB 14136); Yecla, Sierra de Salinas, pr. Cerro Laurel, 30SXH7263, 1160 m, 27-IV-2003, *Cano* (MUB 15140). Epiphyte on bases, branches or trunks of *Acer granatense* Boiss., *A. monspessulanum* L., *Juglans regia* L., *Juniperus oxycedrus*, *J. phoenicea* L., *Pinus halepensis*, *Populus nigra* L., *Quercus faginea* Lam. and *Q. rotundifolia*.

Previous record: Ros et al. (1996).

***Orthotrichum affine*** Schrad. ex Brid.

Selected material studied: Alhama de Murcia, Sierra de Carrascoy, Rambla de Roy, 30SXG5190, 900 m, 2-IV-1996, *Cano & Ros* (MUB 6591); Alhama de Murcia, Sierra de Carrascoy, pr. repetidor T.V., 30SXG5290, 1050 m, 21-X-2001, *Cano* (MUB 11950); Bullas, Sierra de Burete, 30SXH1009, 780 m, 8-XII-2002, *Cano* (MUB 14142); Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13065); Moratalla, Sierra de los Álamos, Arroyo de la Celada, 30SWH9226, 1250 m, 2-V-2002, *Cano* (MUB 14099); Moratalla, Rincón de los Huertos, 30SWH8233, 1280 m, 2-V-2002, *Cano* (MUB 14075). Epiphyte on trunks of *Acer granatense*, *Juniperus phoenicea*, and *Quercus rotundifolia*.

New record for Murcia. An epiphytic species widespread in the Iberian Peninsula.

***Orthotrichum anomalum*** Hedw.

Selected material studied: Abanilla, Sierra de Quibas, 30SXH6441, 950 m, 9-III-2002, *Cano* (MUB 12762); Cehegín, Sierra Lavia, 30SXH1003, 850 m, 5-I-2003, *Cano* (MUB 14216); Lorca, Sierra del Gigante, 30SWG9077, 990 m, 15-IV-2002, *Cano* (MUB 12936); Moratalla, Sierra de los Álamos, Arroyo de la Celada, 30SWH9226, 1250 m, 2-V-2002, *Cano* (MUB 14212). On calcareous rocks and epiphytic on bases of *Pistacia lentiscus* L. and trunk of *Acer granatense*.

Previous record: Ros & Llimona (1984).

***Orthotrichum cupulatum*** Hoffm. ex Brid.

Selected material studied: Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13062); Moratalla, Rincón de los Huertos, 30SWH8233, 1280 m, 2-V-2002, *Cano* (MUB 14058); Moratalla, Benizar, Fuente de Benizar, 30SWH8836, 970 m, 11-IV-2003, *Guerra* (MUB 15426); Moratalla, Sierra de Villafuerte, Arroyo Blanco, 30SWH7423, 1100 m, 26-IV-2002, *Cano et al.* (MUB 15025). Calcareous rocks and epiphytic on trunks of *Juglans regia*, *Juniperus oxycedrus* and bases of *Quercus rotundifolia*.

Previous records: Allorge & Allorge (1946); Alcaraz et al. (1982) sub *Orthotrichum cupulatum* var. *sardagnanum*; Ros & Llimona (1984) sub *Orthotrichum cupulatum* and *Orthotrichum cupulatum* var. *sardagnanum*; Ros & Guerra (1987).

***Orthotrichum diaphanum*** Schrad. ex Brid.

Selected material studied: Abanilla, Sierra de Quibas, 30SXH6441, 950 m, 9-III-2002, *Cano* (MUB 12760); Alhama de Murcia, Sierra de Carrascoy, pr. repetidor T.V., 30SXG5290, 1050 m, 21-X-2001, *Cano* (MUB 11945); Bullas, Sierra de Burete, 30SXH1009, 780 m, 8-XII-2002, *Cano* (MUB 14141); Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13043); Lorca, Sierra de la Torrecilla, Rambla del Hortillo, 30SXG0270, 700 m, 11-V-2002, *Cano* (MUB 13012); Moratalla, Rincón de los Huertos, 30SWH8233, 1280 m, 2-V-2002, *Cano* (MUB 14059); Moratalla, Sierra de los Álamos, cortijo del Manco, 30SXH9128, 1090 m, 2-V-2002, *Cano* (MUB 14105); Yecla, Arabí, 30SXH4984, 860 m, 17-XI-2002, *Cano* (MUB 14032). Epiphytic on bases or trunks of *Arbutus unedo* L., *Acer granatense*, *Juglans regia*, *Juniperus oxycedrus*, *Populus nigra*, *Quercus coccifera* L., *Q. faginea* and *Q. rotundifolia*.

Previous records: Ros & Llimona (1984).



***Orthotrichum lyellii*** Hook. & Taylor

Selected material studied: Alhama de Murcia, Sierra de Carrascoy, pr. repetidor T.V., 30SXG5290, 1050 m, 21-X-2001, *Cano* (MUB 11944); Moratalla, Rincón de los Huertos, 30SWH8233, 1280 m, 2-V-2002, *Cano* (MUB 14077); Puerto Lumbreras, Cabezo de la Jara, 30SWG9655, 1150 m, 1-II-2004, *Cano* (MUB 16058); Yecla, Sierra de Salinas, pr. Cerro Laurel, 30SXH7263, 1160 m, 27-IV-2003, *Cano* (MUB 15139). Epiphytic on trunks of *Acer granatense*, *Populus nigra* and *Quercus rotundifolia*.

Previous record: Ros & Llimona (1984).

***Orthotrichum macrocephalum*** F. Lara, Garilleti & Mazimpaka

Selected material studied: Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13072); Moratalla, Sierra de los Álamos, Cortijo del Manco, 30SXH9128, 1090 m, 2-V-2002, *Cano* (MUB 14106). Epiphytic on trunks of *Juglans regia*, *Quercus faginea* and *Q. rotundifolia*.

Previous record: Ros et al. (1996).

***Orthotrichum pumilum*** Sw.

Selected material studied: Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13071); Moratalla, Sierra de los Álamos, Arroyo de la Celada, 30SWH9226, 1250 m, 2-V-2002, *Cano* (MUB 14093). Epiphyte on trunks or bases of *Quercus faginea* and *Q. rotundifolia*.

New record for Murcia. It was reported for Murcia by Ros et al. (1996). However, after revision of the specimen on which this record is based [Alhama de Murcia, Sierra de Carrascoy, Rambla de Roy, 30SXG5190, 2-IV-1996, *Cano & Ros* (MUB 6040)], the material proved to be *O. schimperi*.

***Orthotrichum rupestre*** Schleich. ex Schwägr.

Selected material studied: Moratalla, Sierra de los Álamos, Arroyo de la Celada, 30SWH9226, 1250 m, 2-V-2002, *Cano* (MUB 14097); Totana, Sierra de Carrascoy, Rambla de Roy, 30SXG5190, 27-II-1998, *Ros et al.* (MUB 15498). Rocks and epiphyte on trunk of *Acer granatense*.

Previous record: Ros & Guerra (1987).

***Orthotrichum scanicum*** Gronwall

Studied material: Alhama de Murcia, Sierra España, pr. E.V.A. 13, 30SXG2592, 1500 m, 9-I-1999, *Cano & Sánchez-Moya* (MUB 9044). Trunk of *Juniperus oxycedrus*.

New record for Murcia. According to Lara et al. (2001), in the Iberian Peninsula this species has been cited in the central Pyrenees, at one locality in NW Spain and several localities in Portugal (Beira Alta and Algarve). This record broadens the range of the species to drier places in Southern Spain.

***Orthotrichum schimperi*** Hammar

Selected material studied: Bullas, Sierra de Burete, 30SXH1009, 780 m, 8-XII-2002, *Cano* (MUB 14143); Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13064); Moratalla, Sierra de los Álamos, Arroyo de la Celada, 30SWH9226, 1250 m, 2-V-2002, *Cano* (MUB 14100); Moratalla, Rincón de los Huertos, 30SWH8233, 1280 m, 2-V-2002, *Cano* (MUB 14056). Epiphytic on trunks of *Acer granatense*, *Juglans regia* and *Quercus rotundifolia*.

New record for Murcia. This species has been regarded as synonym of *O. pumilum* by some authors (Vitt 1973, Corley et al. 1981). However, Cortini-Pedrotti (2001) treated it at species level. Therefore, all the records under *O. pumilum* require critical revision to confirm the present distribution of this species.

***Orthotrichum speciosum*** var. *brevisetum* F. Lara, Garilleti & Mazimpaka

Selected material studied: Alhama de Murcia, Sierra de Carrascoy, Rambla de Roy, 30SXG5190, 2-IV-1996, *Cano & Ros* (MUB 6593); Moratalla, Sierra de los Álamos, Arroyo de la Celada, 30SWH9226, 1250 m, 2-V-2002, *Cano* (MUB 14104). Epiphyte on trunk of *Acer granatense* and *Quercus rotundifolia*.

Previous record: Draper et al. (2003).

***Orthotrichum striatum*** Hedw.

Selected material studied: Bullas, Las Hoyuelas, 30SXH1209, 700 m, 10-X-2002, *Sánchez-Moya* (MUB 15071); Moratalla, Sierra de los Álamos, Arroyo de la Celada, 30SWH9226, 1250 m, 2-V-2002, *Cano* (MUB 14094). Epiphyte on trunks of *Acer granatense*, *Pinus halepensis* and *Quercus rotundifolia*.

New record for Murcia. A widely distributed species in the Iberian Peninsula.

***Orthotrichum tenellum*** Bruch ex Brid.

Selected material studied: Bullas, Las Hoyuelas, 30SXH1209, 700 m, 10-X-2002, *Sánchez-Moya* (MUB 15072); Caravaca de la Cruz, Sierra de la

Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13066); Lorca, Sierra de la Torrecilla, Rambla del Hortillo, 30SXG0270, 700 m, 11-V-2002, *Cano* (MUB 13011); Moratalla, Sierra de los Álamos, Arroyo de la Celada, 30SWH9226, 1250 m, 2-V-2002, *Cano* (MUB 14098); Puerto Lumbreras, Cabezo de la Jara, 30SWG9655, 1150 m, 1-II-2004, *Cano* (MUB 16059). Epiphytic on trunks of *Acer granatense*, *Pinus halepensis*, *Quercus faginea* and *Q. rotundifolia*.

New record for Murcia. A widespread species in the Iberian Peninsula.

***Orthotrichum tortidontium*** F. Lara, Garilleti & Mazimpaka

Selected material studied: Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13067); Mula, Sierra del Cambrón, Pico La Selva, 30SXG1498, 1387 m, 7-XII-2002, *Cano* (MUB 14139). Epiphytic on trunk of *Quercus rotundifolia*.

New record for Murcia. This is a Mediterranean species, reported from Cyprus, Greece, Morocco, Spain and Turkey (Lara et al. 2003). According to these authors, it is an epiphytic moss with a marked preference for Mediterranean-continental environments, and occurring preferentially on conifers. However, the records from Murcia were collected on a trunk of *Quercus rotundifolia*.

***Ortotrichum vittii*** F. Lara, Garilleti & Mazimpaka

Selected material studied: Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13063); Mula, Sierra del Cambrón, Pico La Selva, 30SXG1498, 1387 m, 7-XII-2002, *Cano* (MUB 14130); Moratalla, Rincón de los Huertos, 30SWH8233, 1280 m, 2-V-2002, *Cano* (MUB 14061). Epiphyte on trunks of *Juglans regia* and *Quercus rotundifolia*.

New record for Murcia. According to Lara et al. (1999), this Iberian endemic species is known from Almería, Burgos, Guadalajara, León, Madrid, Segovia and Teruel. Recently, it has been reported from Valencia (Puche 2001).

***Palustriella commutata*** (Hedw.) Ochyra

Selected material studied: Moratalla, Benizar, Fuente de Benizar, 30SWH8836, 970 m, 11-IV-2003, *Cano* (MUB 15429); Moratalla, Sierra de Villafuerte, pr. Fuente de Cantalar, 30SXH7222, 1400 m, 8-V-2004, *Cano* (MUB 16884). Streams banks and talus with seeping water.

Previous records: Ros & Llimona (1984) sub *Cratoneuron commutatum*; Ros & Guerra (1987) sub *Cratoneuron commutatum*.

***Phascum cuspidatum*** Hedw. var. *cuspidatum*

Selected material studied: Jumilla, Sierra del Carche, Barranco del Revolcador, 30SXH6056, 900 m, 9-XII-1983, *Ros* (MUB 3436); Moratalla, Fuente Mellina, 30SWH7924, 1200 m, 8-III-1984, *Ros* (MUB 2976). Open soils.

Previous records: Casas (1973); Ros & Guerra (1987); Guerra et al. (1991); Rams et al. (2000).

***Phascum cuspidatum*** var. *papillosum* (Lindb.) G. Roth

Selected material studied: Alhama de Murcia, Sierra de Carrascoy, 5-III-1989, *Álvarez-Rogel* (MUB 3567). Acidic open soils.

Previous records: Guerra et al. (1991) sub *Phascum cuspidatum* subsp. *papillosum*.

***Phascum cuspidatum*** var. *piliferum* (Hedw.) Hook & Taylor

Selected material studied: Jumilla, Sierra del Carche, Barranco del Revolcador, 30SXH6057, *Ros* (MUB 3436). Open soils.

Previous record: Ros & Guerra (1987).

***Phascum cuspidatum*** var. *retortifolium* J. Guerra & Ros

Selected material studied: Alhama de Murcia, Sierra de Carrascoy, Rambla de Roy, 30SXG5190, 800 m, 24-IV-1986, *Ros* (MUB 3493); Cartagena, Los Belones, Rambla de la Carrasquilla, 30SXG9465, 100 m, 14-II-1987, *Ros* (MUB 3566). Open soils.

Previous record: Guerra et al. (1991).

***Phascum vlassovii*** Laz.

Material studied: Lorca, Sierra de la Torrecilla, Rambla del Hortillo, 30SXG0371, 3-III-1984, *Ros* (MUB 2963). Open soil.

Previous records: Jiménez et al. (1989); Guerra et al. (1991).

***Philonotis fontana*** (Hedw.) Brid.

Selected material studied: Caravaca de la Cruz, Las Oicas, Río Argos, 30SWH8915, 18-III-1984, *Ros* (MUB 6153). Talus with seeping water.

New record for Murcia. A widespread species in the Iberian Peninsula.

***Plagiomnium undulatum*** (Hedw.) T.J. Kop.

Selected material studied: Moratalla, Sierra de los Álamos, Cenajo del Agua Cernida, 30SWH8829, 1000 m, 30-X-1982, *Egea & Ciller* (MUB 841). Peaty soils.

Previous records: Ros et al. (1996); Gómez-Menor et al. (1999).

***Platyhypnidium riparioides*** (Hedw.) Dixon

Selected material studied: Bullas, Río Mula, Salto Lucero (Usero), 30SXH1709, 600 m, 6-III-1981, *Ros* (MUB 257); Moratalla, Sierra de los Álamos, Puerta de Moratalla, Río Benamor, 30SWH9130, 700 m, 18-XII-1983, *Ros* (MUB 3612); Moratalla, Benizar, Rincón de las Cuevas, 30SWH8835, 950 m, 11-IV-2003, *Cano* (MUB 15431). Stream banks and submerged in water.

Previous records: Ros & Llimona (1984) sub *Rhynchostegium riparioides*; Ros & Guerra (1987) sub *Rhynchostegium riparioides*.

***Pleuroidium acuminatum*** Lindb.

Selected material studied: Los Alcázares, 30SXG8878, 0 m, 18-II-1984, *Ros* (MUB 13139). Acidic open soils.

New record for Murcia. A widespread species in the Iberian Peninsula on exposed and acidic soils.

***Pleurochaete squarrosa*** (Brid.) Lindb.

Selected material studied: Abanilla, Sierra de Quibas, 30SXH6441, 950 m, 9-III-2002, *Cano* (MUB 12763); Lorca, Sierra de la Torrecilla, Rambla del Hortillo, 30SXG0270, 700 m, 11-V-2002, *Cano* (MUB 13009). Soils and soil accumulated on calcareous rocks.

Previous records: Ade & Koppe (1942); Rungby (1962); Alcaraz et al. (1982); Ros & Llimona (1984); Ros & Guerra (1987); Sánchez-Moya & Cano (1999).

***Pohlia cruda*** (Hew.) Lindb.

Studied material: Moratalla, Macizo de Revolcadores, pr. Pico El Obispo, 30SWH6514, 1900 m, 7-III-2004, *Cano* (MUB 16659).

New record for Murcia. According to Hill et al. (1994), this species has a worldwide distribution in cool regions and on mountains.

***Pohlia melanodon*** (Brid.) A.J. Shaw

Selected material studied: Bullas, Río Mula, Salto Lucero (Usero), 30SXH1709, 600 m, 11-III-1981,

*Larios & Ros* (MUB 438); Caravaca de la Cruz, huerta de Caravaca de la Cruz, 30SWH9916, 19-VI-1982, *Ros* (MUB 723); Moratalla, Llanos de Tenorio, Río Benamor, 30SWH9730, 7-IV-1982, *Ros* (MUB 3334). Stream banks, edge of irrigation channels, rocks in streams.

Previous records: Ros & Llimona (1984) sub *Mniobryum delicatulum*; Ros & Guerra (1987) sub *Mniobryum delicatulum*.

***Pohlia wahlenbergii*** (F. Weber & D. Mohr) A.L. Andrews

Selected material studied: Calasparra, Cañaverosa, 30SXH1335, 10-III-2002, *Velasco* (MUB 12962). Stream banks.

Previous record: Rams et al. (2000).

***Pottia pallida*** Lindb.

Selected material studied: Cartagena, salinas de la Manga, 30SXG0167, 0 m, 26-II-1987, *Guerra* (MUB 2354); Cartagena, Isla Grosa, 30SXG9970, 30 m, 8-II-1980, *Aboal & Ros* (MUB 777); San Pedro del Pinatar, Salinas del Cotorrillo, 30SXG9698, 0 m, *Gea-Valero* (MUB 3014). Saline soils.

Previous records: Guerra & Ros (1988).

***Pottia lanceolata*** (Hedw.) Müll. Hal.

Selected material studied: Alhama de Murcia, Sierra de Carrascoy, Barranco de la Tía Ginesa, 30SXG5089, 900 m, 27-II-1998, *Ros* (MUB 15545); Cartagena, Sierra de la Muela, Pico La Muela, 30SXG6861, 550 m, 11-I-2004, *Cano* (MUB 15953); Lorca, Sierra del Gigante, 30SWG9077, 990 m, 15-IV-2002, *Cano* (MUB 12943); Moratalla, pr. Sabinar, 30SWH7528, 26-IV-2002, *Ros et al.* (MUB 12970). Open soils.

Previous records: Ros & Guerra (1987).

***Pottiopsis caespitosa*** (Bruch) Blockeel & A.J.E. Sm.

Selected material studied: Cartagena, Atamaría, Rambla de la Carrasquilla, 6-III-1998, *Cano & Ros* (MUB 11878). Accumulated soil between rocks.

Previous record: Casas (1973) sub *Trichostomum caespitosum*; Ros & Guerra (1987) sub *Pottia caespitosa*.

***Protobryum bryoides*** (Dicks.) J. Guerra & M.J. Cano

Selected material studied: Alhama de Murcia, Sierra Espuña, 30SXG3293, 14-V-1983, *Ros* (MUB

10331); Moratalla, Sierra de Villafuerte, pr. Fuente de Cantalar, 30SXH7222, 1400 m, 8-V-2004, *Cano* (MUB 16882). Open soils.

Previous records: Ros & Guerra (1985, 1987) sub *Pottia bryoides*.

***Pseudocrossidium hornchuchianum*** (Schultz)

R.H. Zander

Selected material studied: Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13051); Jumilla, Sierra del Carche, Solana de la Omblanquilla, 30SXH5856, 1000 m, 5-II-1988, *Ros & Guerra* (MUB 3034); Lorca, Sierra de la Almenara, castillo de Lorca, 30SXG1471, 400 m, 3-III-1984, *Ros* (MUB 3952) Soil accumulated on rocks, ledges and fissures with soil, open soils.

Previous records: Casas (1973) sub *Barbula hornschuchiana*; Ros & Llimona (1984); Ros & Guerra (1987); Guerra et al. (1993); Sánchez-Moya & Cano (1999).

***Pseudocrossidium obtusulum*** (Lindb.) H.A.

Crum & L.E. Anderson

Studied material: Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13051); Moratalla, Sierra de Villafuerte, Fuente de Cantalar, 30SWH7423, 1500 m, 17-V-2003, *Cano* (MUB 15282); Zarcilla de Ramos, Rambla de los Chillidos, 30SWH7423, 28-II-2003, *Guerra* (MUB 17640). Accumulated soil on calcareous rocks and exposed soil.

New record for the Iberian Peninsula. This taxon can be distinguished from the other two species of this genera which grow in the Iberian Peninsula (*Pseudocrossidium hornschuchianum* and *Ps. revolutum*) by its leaves ovate to ovate-lanceolate, apex obtuse or occasionally acute and costa excurrent in a short mucro. Also, it shows a less twisted habit when dry than the other two species. It has been reported from North America, Sweden and Germany (Tan et al. 1981).

***Pseudocrossidium revolutum*** (Brid.) R.H. Zander

Selected material studied: Moratalla, Sierra de Moratalla, 30SWH6412, 16-IV-1982, *Ros* (MUB 3366); Moratalla, Sierra de Villafuerte, Arroyo Blanco, 30SWH7423, 1100 m, 26-IV-2002, *Cano et al.* (MUB 15021). Accumulated soil on rocks.

Previous records: Rungby (1964) sub *Barbula revoluta*; Casas (1973); Ros & Llimona (1984); Ros & Guerra (1987).

***Pseudoscleropodium purum*** (Hedw.) M. Fleisch.

Selected material studied: Alhama de Murcia, Sierra Espuña, Río Espuña, 30SXG2891, 800-1000 m, 25-XI-1984, *Ros* (MUB 3453). Humiferous soils.

Previous records: Alcaraz et al. (1982); Ros & Guerra (1987).

***Pterogonium gracile*** (Hedw.) Sm.

Selected material studied: Alhama de Murcia, Sierra de Carrascoy, pr. repetidor T.V., 30SXG5290, 1050 m, 21-X-2001, *Cano* (MUB 11948); Mula, Sierra del Cambrón, Pico La Selva, 30SXG1498, 1387 m, 7-XII-2002, *Cano* (MUB 14132). Calcareous rocks and epiphytic on trunk of *Quercus rotundifolia*.

Previous records: Allorge & Allorge (1946) sub *Pterogonium ornithopodioides*; Ros & Llimona (1984); Ros & Guerra (1987).

***Pterygoneurum lamellatum*** (Lindb.) Jur.

Selected material studied: Bullas, Río Mula, Salto Lucero (Usero), 30SXH1709, 600 m, 8-IV-1984, *Ros* (MUB 2914); Las Torres de Cotillas, urbanización Los Romeros, 11-II-2000, *Werner* (MUB 11484). Open soils.

Previous records: Ros & Guerra (1987, 1988); Carrión et al. (1995); Guerra et al. (1995).

***Pterygoneurum ovatum*** (Hedw.) Dixon

Selected material studied: Caravaca de la Cruz, 10-III-1985, *Ros* (MUB 3621); Mazarrón, carretera de Mazarrón a Águilas, 30SXG4561, 100 m, 19-II-1984, *Ros* (MUB 1291); Moratalla, Macizo de Revolcadores, pr. Pico El Obispo, 30SWH6413, 2000 m, 7-III-2004, *Cano* (MUB 16660); Las Torres de Cotillas, Los Pulpites, 25-II-2001, *Ros* (MUB 11359). Open soils.

Previous records: Ros & Llimona (1984); Ros & Guerra (1987, 1988); Casas et al. (1989); Guerra et al. (1995); Rams et al. (2000).

***Pterygoneurum sampaiianum*** (Guim.) Guim.

Studied material: Lorca, pr. al Rincón (MUB 6139). Open soils.

Previous records: Ros & Guerra (1987, 1988); Carrión et al. (1995); Guerra et al. (1995).

***Pterygoneurum subsessile*** (Brid.) Jur.

Studied material: Moratalla, Sierra de Villafuerte, 30SWH7422, 1654 m, 7-III-2004, *Cano* (MUB 16663). Open soil.

New record for Murcia. In Southern Spain, this species is known from Albacete, Almería (Guerra et al. 1995) and Alicante (Cano et al. 1996).

***Rhynchostegiella litorea*** (De Not.) Limpr.

Selected material studied: Mula, Sierra de Ponce (Sierra del Cambrón), Pico La Selva, 30SXH1598, 1200 m, 9-V-1981, *Ros* (MUB 279); Jumilla, Sierra del Carche, Barranco del Revolcador, 30SXH6056, 900 m, 9-XII-1983, *Ros* (MUB 3437). Soil accumulated on rocks or at their base.

Previous records: Ros & Llimona (1984) sub *Rhynchostegiella tenella* var. *litorea*; Ros & Guerra (1987) sub *Rhynchostegiella tenella* var. *litorea*.

***Rhynchostegiella tenella*** (Dicks.) Limpr.

Studied material: Moratalla, Sierra de los Álamos, Cenajo del Agua Cernida, 30SWH8829, 1000 m, 30-IV-1983, *Ros* (MUB 2878). Rock fissure.

New record for Murcia. A widespread species in the Iberian Peninsula.

***Rhynchostegium megapolitanum*** (Blandow ex F. Weber & D. Mohr) Bruch & Schimp.

Selected material studied: Abarán, Sierra de la Pila, Cueva de la Excomuni3n, 30SXH5538, 4-III-1999, *Ros* (MUB 15551); Bullas, NE del Aceniche, 30SXH1306, 780 m, 6-II-1982, *Ros* (MUB 467); Calasparra, Cañaverosa, 293 m, 26-X-2002, *Cano* (MUB 14028); Cartagena, Atamaría, Rambla la Carrasquilla, 30SXH9364, 150 m, 13-II-1982, *Ros* (MUB 856); Lorca, Sierra del Gigante, 30SWG9077, 990 m, 15-IV-2002, *Cano* (MUB 12942); Yecla, Arabí, 30SXH4984, 860 m, 17-XI-2002, *Cano* (MUB 14036). Humiferous soils and talus on schists.

Previous records: Allorge & Allorge (1946); Alcaraz et al. (1982); Ros & Llimona (1984); Ros & Guerra (1987).

***Rosulabryum canariense*** (Brid.) Ochyra

Selected material studied: Jumilla, Sierra del Carche, Barranco del Revolcador, 30SXH6056, 900 m, 8-XII-1983, *Ros* (MUB 1681); Moratalla, Sierra de los Álamos, Cenajo del Agua Cernida, 30SWH9130, 900 m, 19-III-1984, *Ros* (MUB 3304); Mula, Sierra del Cambr3n, Pico La Selva, 30SXG1498, 1387 m, 7-XII-2002, *Cano* (MUB 14138). Humiferous soils.

Previous records: Ros & Llimona (1984) sub *Bryum canariense*; Ros & Guerra (1987) sub *Bryum canariense*.

***Rosulabryum capillare*** (Hedw.) J.R. Spence

Selected material studied: Jumilla, Sierra del Carche, Pico del Carche, 30SXH6055, 1370 m, 13-I-1983, *Ros* (MUB 3513); Jumilla, Sierra del Carche, Barranco del Revolcador, 30SXH6057, 900 m, 9-XII-1983, *Ros* (MUB 3220). Humiferous soils and soil in rock fissures.

Previous records: Sim3 (1976) sub *Bryum capillare*; Alcaraz et al. (1982) sub *Bryum capillare*; Ros & Guerra (1987) sub *Bryum capillare* and *B. capillare* f. *longipilum*; S3nchez-Moya & Cano (1999).

***Rosulabryum donianum*** (Grev.) Ochyra

Selected material studied: Cartagena, Sierra de la Muela, subida a la Sierra, 30SXG6862, 200 m, 7-III-1984, *Ros* (MUB 3960); Lorca, Sierra de la Torrecilla, Los Majales, 30SXG0372, 600 m, 3-III-1984, *Ros* (MUB 3943); Moratalla, Sierra de los Álamos, Cenajo del Agua Cernida, 30SWH9130, 1000 m, 30-IV-1983, *Ros* (MUB 3445). Soils and accumulated soil on rocks.

Previous records: Allorge & Allorge (1946) sub *Bryum donianum*; Ros & Guerra (1987) sub *Bryum donianum*.

***Rosulabryum laevifilum*** (Syed) Ochyra

Selected material studied: Cartagena, Sierra de la Muela, 30SXG6862, 250 m, 7-III-1984, *Ros* (MUB 3974). On soils.

Previous records: Ros & Guerra (1987, 1988) sub *Bryum flaccidum*; S3nchez-Moya & Cano (1999) sub *Bryum capillare* var. *flaccidum*.

***Rosulabryum torquescens*** (Bruch ex De Not.) J.R. Spence

Selected material studied: Cartagena, Sierra de la Muela, Fuente de la Muela, 30SXG6861, 500 m, 7-III-1984, *Ros* (MUB 3973); Mula, Barranco del Aceniche, 30SXH1202, 840 m, 1-XII-1978, *Ros* (MUB 359); Puerto Lumbreras, pr. Puerto Lumbreras, 30SXG0461, 550 m, 1-II-2004, *Cano* (MUB 16054). All kind of soils, mainly humiferous.

Previous records: Casas (1973) sub *Bryum capillare* subsp. *torquescens*; Alcaraz et al. (1982) sub *Bryum torquescens*; Guerra & Puche (1984) sub *Bryum torquescens*; Ros & Llimona (1984) sub *Bryum torquescens*; Ros & Guerra (1987) sub *Bryum torquescens*; Rams et al. (2000) sub *Bryum torquescens*.

***Schistidium crassipilum*** H.H. Blom

Selected material studied: Fortuna, Sierra de la Pila, 30SXH5837, 22-III-2002, *Fernández-Martínez et al.* (MUB 12979); Jumilla, Sierra del Carche, Umbría del Mosquito, 30SXH6056, 1000 m, 1-V-1981, *Ros* (MUB 825). Calcareous rocks and accumulated soil on rocks.

New record for Murcia. According to Casas (2000), it is the most frequent species of *Schistidium* in Spain. It has not been reported from Southern Spain, although Casas et al. (2001) cited it from the autonomous region of Valencia.

***Schistidium singarense*** (Schiffn.) Laz.

Selected material studied: Abanilla, Sierra de Quibas, 30SXH6441950 m, 9-III-2002, *Cano* (MUB 12765); Alhama de Murcia, Sierra de Carrascoy, Rambla de la Tía Ginesa, 30SXG5089, 900 m, 26-II-1984, *Ros* (MUB 3933); Cehegín, Sierra de Burete, 30SXH0710, 900-1000 m, 10-V-1981, *Ros* (MUB 281); Lorca, Sierra de la Torrecilla, Rambla del Hortillo, 30SXG0270, 700 m, 11-V-2002, *Cano* (MUB 13006); Moratalla, Sierra Cambrón, 30S, 20-II-2000, *Gil López* (MUB 12963); Mula, Sierra de Ponce (Sierra del Cambrón), Barranco del Aceniche, 30SXH1201, 850 m, 8-IV-1984, *Ros* (MUB 3482); Totana, Sierra Espuña, pr. Río Espuña, 30SXG2890, 1100 m, 12-II-1984, *Ros* (MUB 3423). Fissures with soil and calcareous rocks or schistes.

New record for Murcia. According to Casas (2000), it is the most frequent species of the genus in Mediterranean areas. In Southeastern Spain it was already reported by García-Zamora et al. (1998) from Almería.

***Scleropodium touretii*** (Brid.) L.F. Koch

Selected material studied: Alhama de Murcia, Sierra de Carrascoy, Rambla de Roy, 30SXG5190, 700-900 m, 4-XII-1983, *Ros* (MUB 3218); Alhama de Murcia, Sierra de Carrascoy, Rambla de la Tía Ginesa, 30SXG5089, 900 m, 26-II-1984, *Ros* (MUB 3283); Cartagena, Atamaría, Monte de las Cenizas, 15-XI-1988, *Guerra* (MUB 13772); Totana, Sierra Espuña, pr. Río Espuña, 30SXG2890, 1100 m, 12-II-1984, *Ros* (MUB 3283). Talus on calcareous or metamorphic rocks.

Previous records: Allorge & Allorge (1946) sub *Scleropodium illicebrum*; Ros & Llimona (1984); Ros & Guerra (1987).

***Scorpiurium circinatum*** (Brid.) M. Fleisch. & Loeske

Selected material studied: Abanilla, Sierra de Quibas, 30SXH6441, 950 m, 9-III-2002, *Aboal* (MUB

12766); Abarán, Sierra de la Pila, Cueva de la Excomuni3n, 30SXH5538, 4-III-1999, *Ros* (MUB 15553); Cartagena, Cabezo de la Fuente, 30SXG9665, 100 m, 6-V-1983, *Ros* (MUB 3135); Jumilla, Sierra del Carche, Solana de la Omblanquilla, 30SXH5856, 1000 m, 3-III-1985, *Ros* (MUB 1296); Moratalla, Sierra de los Álamos, Cenajo del Agua Cernida, 30SWH8829, 1000 m, 30-IV-1983, *Ros* (MUB 2877). Talus and fissures with accumulated soil and on rocks.

Previous records: Allorge & Allorge (1946); Rungby (1964); Ros & Llimona (1984); Ros & Guerra (1987); Casas et al. (1989).

***Seligeria acutifolia*** Lindb.

Selected material studied: Mula, Barranco del Aceniche, 30SXH1201, 850 m, 8-IV-1984, *Ros* (MUB 3482); Moratalla, Rinc3n de los Huertos, 30SWH8234, 1265 m, 2-V-2002, *Cano* (MUB 14052). Calcareous rocks.

Previous record: Ros & Guerra (1987).

***Syntrichia calcicola*** J.J. Amann

Selected material studied: Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13073); Cehegín, Sierra Lavia, Umbría de Don Francisco, 30SXH1002, 1000 m, 5-II-1983, *Ros* (MUB 3235); Jumilla, Sierra del Carche, Pico del Carche, 30SXH6056, 1000 m, 1-V-1981, *Ros* (MUB 769); Puerto Lumbreras, Sierra de Enmedio, Cabezo La Jara, 30SXG9756, 800 m, 19-XII-1982, *Ros* (MUB 3150). Basic soils and on base of trunk of *Quercus rotundifolia*.

Previous records: Ros & Llimona (1984) sub *Tortula calcicolens*; Ros & Guerra (1987) sub *Tortula calcicolens*; Gallego et al. (2002a).

***Syntrichia caninervis*** Mitt var. *caninervis*

Selected material studied: Caravaca de la Cruz, Royos de Abajo, 30SWG8593, 900 m, 8-I-1983, *Ros* (MUB 1199); Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13045). Talus and accumulated soil at the base of rocks.

Previous records: Casas et al. (1985) sub *Tortula caninervis*; Ros & Guerra (1985, 1987) sub *Tortula caninervis*; Gallego (2002); Gallego et al. (2002b).

***Syntrichia caninervis*** var. *gypsophila* (J.J. Amman ex G. Roth) Ochya

Selected material studied: Caravaca de la Cruz, Archivel, Puntal de la Vieja, 30SWH81, 10-III-1985, *Ros* (MUB 3552); Moratalla, Sierra de Moratalla,

Puntal de la Vieja, 30SWH7923, 1300 m, 18-III-1984, *Ros* (MUB 3199); Moratalla, Sierra de Moratalla, Pico Revolcadores, Barranco del Rey, 30SWH6411, 1450 m, 16-IV-1982, *Ros* (MUB 3358). Open soils, sometimes gypsiferous.

Previous record: Gallego et al. (2002b).

***Syntrichia laevipila*** Brid.

Selected material studied: Alhama de Murcia, Sierra de Carrascoy, repetidor T.V., 30SXG5290, 1050 m, 21-X-2001, *Cano* (MUB 11943); Bullas, Las Hoyuelas, 30SXH1209, 700 m, 10-X-2002, *Sánchez-Moya* (MUB 15069). Epiphyte on trunks of *Quercus rotundifolia* and base of *Pinus halepensis*.

Previous record: Ros et al. (1996) sub *Tortula laevipila* and *T. pagorum*; Gallego et al. (2004).

***Syntrichia montana*** Nees

Selected material studied: Abanilla, Sierra de Quibas, 30SXH6441, 950 m, 9-III-2002, *Cano* (MUB 12759); Alhama de Murcia, Sierra de Carrascoy, Rambla de Roy, 30SXG5189, 800 m, 1-II-1980, *Alcaraz* (MUB 102); Cehegín, Sierra de Burete, 30SXH0509, 900-1000 m, 10-V-1981, *Ros & Llimona* (MUB 864); Lorca, Sierra del Gigante, 30SWG9077, 990 m, 15-IV-2002, *Cano* (MUB 12934); Moratalla, Sierra de la Muela, 30SWH8934, 1280 m, 11-IV-2003, *Cano* (MUB 15426); Mula, Sierra de Ponce (Sierra del Cambrón), Pico La Selva, 30SXH1598, 1200 m, 7-XI-1981, *Ros* (MUB 487); Murcia, Sierra del Puerto, Cabezo del Puerto, 30SXG6296, 26-I-1979, *Alcaraz* (MUB 6). On calcareous rocks.

Previous records: Allorge & Allorge (1946) sub *Tortula montana*; Alcaraz et al. (1982) sub *Tortula intermedia*; Ros & Llimona (1984) sub *Tortula intermedia*; Ros & Guerra (1987) sub *Tortula intermedia*.

***Syntrichia papillosissima*** (Copp.) Loeske

Selected material studied: Moratalla, Sierra de Moratalla, Barranco de las Conchas, 30SWH6411, 16-IV-1982, *Ros* (MUB 3357). Basic soils.

Previous records: Gallego (2002); Gallego et al. (2002a).

***Syntrichia princeps*** (De Not.) Mitt.

Selected material studied: Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13061); Cehegín, Sierra Lavia, 30SXH1002, 950 m, 31-I-1981, *Ros* (MUB 502); Lorca, Sierra de la Torrecilla, Rambla del Hortillo,

30SXG0270, 700 m, 11-V-2002, *Cano* (MUB 13004); Jumilla, Sierra del Carche, Umbría del Mosquito, 30SXH 6056, 1100 m, 8-XII-1982, *Ros* (MUB 3549); Mula, Sierra de Ponce (Sierra del Cambrón), Pico La Selva, 30SXH1598, 1200 m, 7-XI-1981, *Ros* (MUB 485). Talus on schists, accumulated soils on calcareous rocks and epiphyte on trunk of *Quercus rotundifolia*.

Previous records: Ros & Llimona (1984) sub *Tortula princeps*; Ros & Guerra (1987) sub *Tortula princeps*.

***Syntrichia ruralis*** (Hedw.) F. Weber & D. Mohr var. *ruralis*

Selected material studied: Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13050); Mula, Sierra del Cambrón, Pico La Selva, 30SXG1498, 1387 m, 7-XII-2002, *Cano* (MUB 14128); Moratalla, Rincón de los Huertos, 30SWH8233, 1280 m, 2-V-2002, *Cano* (MUB 14065). Calcareous rocks and epiphyte on trunk of *Quercus rotundifolia*.

Previous records: Allorge & Allorge (1946) sub *Tortula ruralis*; Alcaraz et al. (1982) sub *Tortula ruralis*; Ros & Llimona (1984) sub *Tortula ruralis*; Ros & Guerra (1987) sub *Tortula ruralis*; Gallego (2002).

***Syntrichia ruralis*** var. *ruraliformis* (Besch.) Delogne

Selected material studied: Abarán, Sierra de la Pila, Umbría de los Pardiñales, 30SXH5336, 800 m, 17-IX-1980, *Ros* (MUB 3534); Moratalla, Macizo de Revolcadores, pr. Pico El Obispo, 30SWH6514, 1900 m, 7-III-2004, *Cano* (MUB 16670); Mula, Sierra de Ponce (Sierra del Cambrón), Pico La Selva, 30SXH1598, 1200 m, 7-XI-1981, *Ros* (MUB 505). Humiferous soils and calcareous rocks.

Previous records: Allorge & Allorge (1946) sub *Tortula ruraliformis*; Ros & Guerra (1987) sub *Tortula ruraliformis*.

***Syntrichia subpapillosissima*** (Bizot & R.B. Pierrot ex W.A. Kramer) M.T. Gallego & J. Guerra

Selected material studied: Alhama de Murcia, Sierra Espuña, Valle de Leiva, 30SXG3293, 750 m, 20-V-1984, *Ros* (MUB 3458); Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13075). Basic soils and base of trunk of *Quercus rotundifolia*.

Previous records: Ros & Guerra (1987) sub *Tortula ruraliformis* var. *subpapillosissima*; Gallego (2002); Gallego et al. (2002a).

***Syntrichia virescens*** (De Not.) Ochyra

Selected material studied: Alhama de Murcia, Sierra de Carrascoy, repetidor T.V., 30SXG5290, 1050 m, 21-X-2001, *Cano* (MUB 11942); Bullas, Sierra de Burete, 30SXH1009, 780 m, 8-XII-2002, *Cano* (MUB 14144); Moratalla, carretera El Sabinar-Rincón de los Huertos, 30SWH8433, 1350 m, 3-III-2002, *Cano et al.* (MUB 12756). Epiphyte on trunk of *Quercus rotundifolia* and soil accumulated under *Quercus rotundifolia*.

New record for Murcia. A widely distributed species in the Iberian Peninsula. In Southeastern Spain it has been reported from Albacete and Alicante (Gallego 2002).

***Timmiella barbuloides*** (Brid.) Mönk.

Selected material studied: Cartagena, Peñas Blancas, Rambla del Cañar, 30SXG6062, 100 m, 1-IV-1984, *Ros* (MUB 2895); Cartagena, Sierra de la Muela, 30SXG6862, 200 m, 7-III-1984, *Ros* (MUB 3955). On soils.

Previous record: *Ros & Guerra* (1987).

***Tortella inclinata*** var. ***densa*** (Lorentz & Molendo) Limpr.

Studied material: Caravaca de la Cruz, Archivel, Puntal La Vieja, 30SWH81, 10-III-1985, *Ros* (MUB 3523). On soils.

Previous record: *Ros & Guerra* (1987) sub *Tortella densa*.

***Tortella flavovirens*** (Bruch) Broth. var. ***flavovirens***

Selected material studied: San Javier, Isla Grosa, 30SXG0278, 8-IV-1978, *Ros* (MUB 1221); San Javier, Isla Mayor, 30SXG9674, 22-VI-1983, *Ros* (MUB 2869); San Pedro del Pinatar, Salinas de Cotorrillo, 30SXG9689, 17-XII-1982, *Ros* (MUB 3215). Open and mainly sandy soils.

Previous records: *Rungby* (1964); *Guerra & Puche* (1984); *Ros & Llimona* (1984); *Ros & Guerra* (1987); *Sánchez-Moya & Cano* (1999).

***Tortella flavovirens*** var. ***papillosissima*** Sérgio & Casas

Selected material studied: Cartagena, Valle de Peñas Blancas, 30SXG6062, 28-XI-1982, *Ros* (MUB 815); Lorca, pr. a los Majales, 30SXG0372, 600 m, 3-III-1984, *Ros* (MUB 3942). On base of acidic or calcareous rocks and on calcareous rocks.

Previous record: *Puche* (2004).

***Tortella humilis*** (Hedw.) Jenn.

Selected material studied: Alhama de Murcia, Sierra Espuña, Valle de Leiva, 30SXG3293, 750 m, 20-V-1984, *Ros* (MUB 3221); Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13060); Jumilla, Sierra del Carche, Barranco del Revolcador, 30SXH6056, 900 m, 9-XII-1983, *Ros* (MUB 3454); Moratalla, cortijo el Cerezo, 30SWH9733, 860 m, 7-IV-1982, *Ros* (MUB 3361); Mula, Sierra de Ponce (Sierra del Cambrón), Pico La Selva, 30SXH1598, 1000 m, 9-V-1981, *Ros* (MUB 720); Yecla, Sierra de Salinas, pr. Cerro Laurel, 30SXH7263, 1160 m, 27-IV-2003, *Cano* (MUB 15144). Humiferous soils and epiphyte on base of *Juniperus oxycedrus*.

Previous records: *Alcaraz et al.* (1982); *Ros & Llimona* (1984); *Ros & Guerra* (1987).

***Tortella nitida*** (Lindb.) Broth.

Selected material studied: Abanilla, Sierra de Quibas, 30SXH6441, 950 m, 9-III-2002, *Cano* (MUB 12767); Cartagena, pr. Cobaticas, 30SXH9664, 200 m, 2-III-2003, *Cano* (MUB 14515); Cartagena, Sierra de la Muela, subida a la Sierra, 30SXG6862, 200 m, 7-III-1984, *Ros* (MUB 3957); Fortuna, Sierra de la Pila, Pico de la Pila, 30SXH5836, 1000 m, 13-III-1981, *Ros* (MUB 3528). In fissures or on exposed calcareous rocks.

Previous records: *Ade & Koppe* (1942); *Allorge & Allorge* (1946); *Ros & Guerra* (1987).

***Tortella tortuosa*** (Hedw.) Limpr.

Selected material studied: Moratalla, Sierra de los Álamos, Arroyo de la Celada, 30SWH9226, 1350 m, 2-V-2002, *Cano* (MUB 14087); Moratalla, Sierra de Villafuerte, Arroyo Blanco, 30SWH7423, 1100 m, 26-IV-2002, *Cano et al.* (MUB 15033); Moratalla, Rincón de los Huertos, 30SWH8233, 1280 m, 2-V-2002, *Cano* (MUB 14063). Calcareous rocks.

Previous records: *Allorge & Allorge* (1946); *Rungby* (1964); *Alcaraz et al.* (1982); *Ros & Llimona* (1984) sub *Tortella tortuosa* var. *tortuosa* and *T. tortuosa* var. *brevifolia*; *Ros & Guerra* (1987) sub *Tortella tortuosa* var. *tortuosa* and *T. tortuosa* var. *brevifolia*.

***Tortula atrovirens*** (Sm.) Lindb.

Selected material studied: Cartagena, Sierra de la Muela, Pico La Muela, 540 m, 11-I-2004, *Cano* (MUB 15954); Lorca, Sierra de la Torrecilla, Rambla del Hortillo, 30SXG0270, 700 m, 11-V-2002, *Cano* (MUB 13003); Moratalla, Sierra del Cerezo, cortijo



del Cerezo, 30SWH9734, 1050 m, 7-IV-1982, *Ros* (MUB 3325); Puerto Lumbreras, Sierra de Enmedio, Cabezo La Jara, 30SXG9756, 800 m, 18-XII-1982, *Ros* (MUB 3151). Talus on acidic or basic rocks and open soils.

Previous records: Ros & Guerra (1985, 1987); Sánchez-Moya & Cano (1999).

***Tortula brevissima*** Schiffn.

Selected material studied: Caravaca, carretera Caravaca-Lorca, Barranco Blanco, 30S WH9402, 900 m, 10-III-1985, *Ros*, (MUB 3521); Jumilla, Sierra del Carche, Cabezo de la Rosa, 30SXH5555, 600 m, 21-XII-1982, *Ros* (MUB 3216). Bare soils, mainly gypsiferous.

Previous records: Ros & Guerra (1985, 1987); Rams et al. (2000).

***Tortula canescens*** Mont.

Studied material: Los Alcázares, 30SXG8878, 0 m, 18-II-1984, *Ros* (MUB 3410). On acidic soil.

New record from Murcia. It was reported from Murcia by Cano (2004), but no locality was indicated. Therefore, the above specimen supports the record for this species. This species is widely distributed in Spain on soils and talus on acidic soils.

***Tortula inermis*** (Brid.) Mont.

Selected material studied: Bullas, El Aceniche, 30SXH1409, 820 m, 1-XII-1978, *Egea* (MUB 496); Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13044); Cehégín, Sierra Lavia, Umbría de Don Francisco, 30SXH1002, 1000 m, 5-II-1983, *Ros* (MUB 3236); Lorca, Sierra del Gigante, 30SWG9077, 990 m, 15-IV-2002, *Cano* (MUB 12941); Mula, Sierra del Cambrón, Pico La Selva, 30SXG1498, 1387 m, 7-XII-2002, *Cano* (MUB 14129). Talus on calcareous rocks, soil under rocks and epiphyte on base of *Quercus rotundifolia*.

Previous records: Allorge & Allorge (1946); Ros & Llimona (1984); Ros & Guerra (1987).

***Tortula israelis*** Bizot & F. Bilewsky

Selected material studied: Cartagena, Sierra de la Muela, Fuente de la Muela, 30SXG6861, 450 m, 11-I-2004, *Cano* (MUB 15950); Murcia, Jardín El Salitre, *Rams* (MUB 10421); Murcia, La Albatália, 15-III-2000, *García Fructuoso* (MUB 10247). On calcareous rocks, fissures and walls.

Previous records: Ros et al. (1989) sub *Tortula muralis* var. *baetica*; Guerra et al. (1992) sub *Tortula*

*baetica*; Sánchez-Moya & Cano (1999); Rams et al. (2000).

***Tortula marginata*** (Bruch & Schimp.) Spruce

Studied material: Cartagena, Sierra de la Muela, Fuente de la Muela, 450 m, 11-I-2004, *Cano* (MUB 15949). Murcia, Los Molinos del Río, 30SXH6405, *Calatayud* (MUB 10419). Wet talus and wall.

Previous record: Rams et al. (2000).

***Tortula mucronifolia*** Schwägr.

Studied material: Moratalla, Macizo de Revolca-dores, pr. Pico El Obispo, 30SWH6514, 1900 m, 7-III-2004, *Cano* (MUB 17402). Soil on calcareous rock.

New record for Murcia. According to Cano (2004), this species has only been cited in the Iberian Peninsula from Andorra, Barcelona, Gerona, Huesca, Navarra and Lérida. This record broadens the range of the species to high mountains in Southern Spain.

***Tortula muralis*** Hedw.

Selected material studied: Alhama de Murcia, Sierra de Carrascoy, Rambla de Roy, 30SXG5139, 800 m, *Alcaraz* (MUB 115); Bullas, Río Mula, Salto Lucero (Usero), 30SXH1709, 600 m, *Egea* (MUB 297); Caravaca de la Cruz, castillo de Caravaca de la Cruz, *Ros* (MUB 4741); Cartagena, calle Alfonso X El Sabio, 30SXG7764, *Ros* (MUB 4742); Jumilla, Sierra del Carche, base del Pico de El Carche, 30SXH6055, *Alcaraz & Llimona* (MUB 154); Lorca, carretera Lorca-Campico López, 30SXG2762, 600 m, 11-III-1982, *Ros* (MUB 2863); Moratalla, Sierra del Cerezo, cortijo El Cerezo, 30SWH9733, *Ros* (MUB 3360); Murcia, Fuensanta, 14-IV-1935, (PC). Walls and rocks, occasionally on base of rocks

Previous records: Allorge & Allorge (1946) sub *Tortula muralis* f. *incana*; Alcaraz et al. (1982) sub *Tortula muralis* var. *muralis* and *T. muralis* var. *obcordata*; Ros & Llimona (1984); Ros & Guerra (1987) sub *Tortula muralis* var. *muralis*, *T. muralis* var. *incana* and *T. muralis* var. *obcordata*; Guerra et al. (1992) sub *Tortula muralis* var. *muralis* and *Tortula muralis* var. *obcordata*; Rams et al. (2000) sub *Tortula muralis* var. *muralis* and *Tortula muralis* var. *obcordata*.

***Tortula revolvens*** (Schimp.) G. Roth

Selected material studied: Caravaca de la Cruz, carretera Caravaca de la Cruz-Lorca, Barranco Blanco, 30SWH9402, *Ros* (MUB 3520); Murcia, El Valle, 30SXG6399, 200 m, *Ros* (MUB 3480); Pantano

del Cenajo, 30SXH0743, 200 m, *Ros* (MUB 3375); Puerto Lumbreras, Sierra de Enmedio, Cabezo La Jara, 30SXG9756, 800 m, *Ros* (MUB 3614). Gypsiferous soils.

Previous records: Ros & Guerra (1985, 1987) sub *Tortula revolvens* var. *obtusata*; Guerra et al. (1993) sub *Tortula revolvens* var. *obtusata*.

***Tortula subulata* Hedw., s.l.**

Selected material studied: Jumilla, Sierra del Carche, Umbría del Mosquito, 30SXH 6056, 1100 m, 8-XII-1985, *Ros* (MUB 3438); Moratalla, Macizo de Revolcadores, pr. Pico El Obispo, 30SWH6514, 1900 m, 7-III-2004, *Cano* (MUB 16658); Moratalla, Puerta Moratalla, 30SWH, 700 m, 19-III-1984, *Ros* (MUB 3280). Talus on calcareous rocks and soils.

Ros & Guerra (1987) reported *Tortula subulata* var. *subulata* and *T. subulata* var. *subinermis* (Bruch & Schimp.) Wilson from different localities in Murcia. Revision of these specimens shows that the laminal marginal cells and the shape of the leaf are closer to *T. inermis* while the recurvature of the leaf margin and the habit of the plant when dry is closer to *T. subulata*. Until new studies have been carried out, we refer these specimens to *T. subulata* s.l.

***Tortula vahliana* (Schultz) Mont.**

Selected material studied: Bullas, Río Mula, Salto Lucero (Usero), 30SXH1709, 600 m, 8-IV-1984, *Ros* (MUB 2907); Cartagena, cruce Cartagena-Los Urrutias, 30SXG9172, 0 m, 7-III-1984, *Ros* (MUB 4203); Cartagena, salinas de La Manga, 26-XI-1988, *Guerra* (MUB 2216); Cehegín, Valentín, Molino de Sahajosa, 30SXH1127, 2-XI-2003, 320 m, *Cano et al.* (MUB15698); Murcia, La Albatallía, 15-III-2002, *Dengra Pardo* (MUB 10246); Las Torres de Cotillas, urbanización Los Romeros, 15-XII-2001, *Werner* (MUB 12964). Open, mainly saline soils.

Previous records: Ros & Llimona (1984); Ros & Guerra (1987); Rams et al. (2000).

***Trichostomum brachydontium* Bruch**

Selected material studied: Cartagena, Sierra de Cartagena, El Llano, cerca de Portman, *Esteve Chueca* (MA 4069); Cartagena, Peña del Águila, *Guerra* (MUB 2397); Murcia, El Valle, 30SXH6300, 100 m, 30-I-1998, *Ros & Cano* (MUB 15438); Murcia, Fuensanta, *Runbgy* (C). Open soils and accumulated soil under rocks.

Previous records: Esteve & Cortés Latorre (1954) and Cortés Latorre (1955) sub *Trichostomum viridulum* var. *unguiculatum*; Rungby (1962) sub *T.*

*mutabile* and *T. mutabile* var. *densum*; Runbgy (1964) sub *T. mutabile*; Casas (1973) sub *T. brachydontium* subsp. *mutabile*; Alcaraz et al. (1982) sub *Trichostomum brachydontium* subsp. *mutabile*; Ros & Llimona (1984); Ros & Guerra (1987) sub *T. brachydontium* and *T. brachydontium* subsp. *cuspidatum*, *T. brachydontium* subsp. *densum*, *T. brachydontium* subsp. *mutabile*, *T. brachydontium* subsp. *unguiculatum*; Guerra et al. (1993) sub *T. brachydontium* and *T. brachydontium* subsp. *unguiculatum*; Sánchez-Moya & Cano (1999); Guerra (2002).

***Trichostomum crispulum* Bruch**

Selected material studied: Mula, Sierra del Cambrón, Barranco del Cenajo, 20-XI-2002, *Ros* (MUB 14239); Murcia, El Valle, 30SXH6300, 100 m, 30-I-1998, *Ros & Cano* (MUB 15437); Puerto Lumbreras, pr. Puerto Lumbreras, 30SXG0461, 550 m, 1-II-2004, *Cano* (MUB 16053); Ricote, Sierra de Ricote, *Ros & Werner* (MUB 9709). Open soils and accumulated soil under rocks.

Previous records: Casas (1973); Ros & Llimona (1984); Ros & Guerra (1987); Guerra et al. (1993); Guerra (2002).

***Trichostomum triumphans* De Not.**

Selected material studied: Lorca, Sierra del Gigante, 30SWG9077, 990 m, 15-IV-2002, *Cano* (MUB 12944); Lorca, Lomo de Bas, 30SXG3255, 300 m, 10-III-1984, *Ros* (MUB 2835). Open soils and talus on calcareous rocks.

Previous records: Casas (1973) sub *Trichostomum triumphans* var. *pallidisetum*; Ros & Llimona (1984) sub *Trichostomum triumphans* var. *pallidisetum*; Ros & Guerra (1987) sub *Weissia triumphans* var. *pallidisetum*.

This species is very close to *Pottiopsis caespitosa*, from which it is very difficult to distinguish without seeing the sporophytes. A comparative study of both taxa is needed in order to clarify the identity of these species.

***Weissia brachycarpa* (Nees & Hornsch.) Jur.**

Selected material studied: Caravaca de la Cruz, Sierra de la Zarza, 30SWG6798, 1285 m, 2-V-2002, *Cano* (MUB 13058); Lorca, Sierra de la Torrecilla, Rambla del Hortillo, 30SXG0270, 700 m, 11-V-2002, *Cano* (MUB 13001); Moratalla, Rincón de los Huertos, 30SWH8234, 1265 m, 2-V-2002, *Cano* (MUB 14054). Talus and fissures on calcareous rocks or soil accumulated on schists.

New record for Murcia. It was reported from Murcia by Guerra (2002), but no locality was indicated. Therefore, the above specimens support the record for this species. According to Guerra (2002), this species has been reported in southeastern Spain from Alicante, Albacete and Almería.

***Weissia condensata*** (Voit) Lindb. var. ***condensata***

Selected material studied: Águilas, Cabo Cope, 130 m, 16-III-2003, *Cano* (MUB 14980); Bullas, Sierra de Burete, pr. El Aceniche, 30SXH1404, 6-IV-2002, *Ros* (MUB 12969); Moratalla, Macizo de Revolcadores, pr. Pico El Obispo, 30SWH6514, 1900 m, 7-III-2004, *Cano* (MUB 1667); Yecla, Arabí, 30SXH4984, 860 m, 17-XI-2002, *Cano* (MUB 14029). Talus and fissures on calcareous rocks and soils in *Pinus* formations.

Previous records: Allorge & Allorge (1946) sub *Hymenostomum tortile*; Esteve & Cortés Latorre (1954).

***Weissia condensata*** var. ***armata*** (Thér. & Trab.) M.J. Cano, Ros & J. Guerra

Selected material studied: Mazarrón, Sierra de las Moreras, 30S, 7-III-2003, *Guerra* (MUB 15601). Fissures with soil on calcareous rocks.

New record for Murcia. This taxon has been reported from Tadhikistan and the Iberian Peninsula (Moya et al. 1995), Algeria and Morocco (Cano et al. 2002). In Spain, according to Guerra (2002), it is known from Alicante, Albacete, Logroño and Mallorca and in Portugal from Algarve.

***Weissia controversa*** Hedw. var. ***controversa***

Selected material studied: Moratalla, Sierra de los Álamos, Arroyo de la Celada, 30SWH9226, 1250 m, 2-V-2002, *Cano* (MUB 14091); Mula, Sierra de Ponce (Sierra del Cambrón), Pico La Selva, 30SXH1598, 1300 m, 7-XI-1981, *Ros* (MUB 509). Talus and a tree stump.

Previous records: Ros & Llimona (1984); Ros & Guerra (1987).

***Weissia controversa*** var. ***crispata*** (Nees & Hornsch.) Nyholm

Selected material studied: Moratalla, Sierra de Villafuerte, Arroyo Blanco, 30SWH7423, 1100 m, 26-IV-2002, *Cano et al.* (MUB 13805). Talus on calcareous rocks.

Previous records: Ros & Llimona (1984); Ros & Guerra (1987).

***Zygodon rupestris*** Schimp. ex Lorentz

Selected material studied: Yecla, Sierra de Salinas, pr. Cerro Laurel, 30SXH7263, 1160 m, 27-IV-2003, *Cano* (MUB 15138). Epiphyte on trunk of *Quercus rotundifolia*.

Previous record: Ros & Guerra (1985) sub *Zygodon baumgartneri*.

*Liverworts*

***Athalamia spathysii*** (Lindenb.) S. Hatt.

Selected material studied: Murcia, El Valle, 30SXG6399, 200 m, 30-I-1998, *Ros & Cano* (MUB 15470); Ojós, Sierra del Cajal, 30SXH4421, 9-III-1986, *Ríos* (MUB 5345); Moratalla, cercanías a Benizar, 26-V-1990, *Guerra* (MUB 3645). Fissures and ledges on calcareous rocks.

Previous record: Ros & Guerra (1985).

***Athalamia hyalina*** (Sommerf.) S. Hatt.

Studied material: Moratalla, Macizo de Revolcadores, pr. Pico El Obispo, 30SWH6514, 1900 m, 7-III-2004, *Cano* (MUB 16666). In calcareous rock crevices.

New record for Murcia. This species has been reported in Southern Spain from Albacete (Jiménez & Ros 1984) and Alicante (Cano & García-Zamora 1995).

***Calypogeia fissa*** (L.) Raddi

Studied material: La Unión, Monte Sancti Spíritus, 30SXG8864, 350 m, 10-III-1998, *Sánchez-Moya* (MUB 15080). Soil on slate rocks.

Previous record: Sánchez-Moya & Cano (1999).

***Cephaloziella baumgartneri*** Schiffn.

Selected material studied: Calasparra, carretera de Socovos a 1 km del cruce, 30SXG0335, 500 m, 5-II-1982, *Llimona* (MUB 755); Cartagena, Sierra de la Muela, subida a la Sierra, 30SXG6862, 200 m, 7-III-1983, *Ros* (MUB 3748); Moratalla, Puerta de Moratalla, Río Benamor, 30SWH9130, 700 m, 18-XII-1983, *Ros* (MUB 3768); Totana, pr. Río Espuña, 30SXG2890, 1100 m, 12-II-1984, *Ros* (MUB 3760). Talus on calcareous rocks.

Previous records: Jovet-Ast & Bischler (1976); Ros & Llimona (1984); Ros & Guerra (1987); Sánchez-Moya & Cano (1999).

***Fossombronia angulosa*** (Dicks.) Raddi

Selected material studied: La Unión, Monte Sancti Spiritu, 30SXG8864, 350 m, 10-III-1998, *Sánchez-Moya* (MUB 15081). Soil on slate rocks.

Previous record: Sánchez-Moya & Cano (1999).

***Fossombronia caespitiformis*** De Not. ex Rabenh.

Selected material studied: Cartagena, Sierra de la Muela, subida a la Sierra, 30SXG6862, 200 m, 7-III-1983, *Ros* (MUB 3741); Mazarrón, Fuente de Meca, 30SXG4361, 250 m, 10-III-1984, *Ros* (MUB 3472); Murcia, carretera Murcia-San Javier, km 6, 30SXG7091, 180 m, 10-III-1984, *Ros* (MUB 3250); Murcia, Sierra del Puerto, Puerto de la Cadena, 30SXH6197, 200 m, 23-II-1983, *Ros* (MUB 3743). Open soils.

Previous records: Jovet-Ast & Bischler (1976); Alcaraz et al. (1982); Ros & Guerra (1987); Sánchez-Moya & Cano (1999).

***Fossombronia pusilla*** (L.) Nees

Studied material: Cartagena, Isla del Ciervo, 30SXG9970, 20-II-1983, *Ros* (MUB 3766). Bare soils.

Previous record: Ros & Guerra (1987).

***Frullania dilatata*** (L.) Dumort.

Selected material studied: Alhama de Murcia, Sierra de Carrascoy, Rambla de Roy, 30SXG5189, 1000 m, 4-XII-1983, *Ros* (MUB 884); Cartagena, El Carmolí, 30SXG9073, 100 m, *Aboal et al.* (MUB 884); Fortuna, Sierra de la Pila, 30SXH5738, 800 m, 1-VI-1979, *Alcaraz* (MUB 24); Totana, Sierra de Carrascoy, Rambla de Roy, 30SXG5190, 27-II-1998, *Ros et al.* (MUB 15515). On calcareous or acidic rocks and epiphyte on trunk of *Quercus rotundifolia*.

Previous record: Alcaraz et al. (1982).

***Jungermannia atrovirens*** Dumort.

Studied material: Moratalla, Rincón de los Huertos, 30SWH8234, 1265 m, 2-V-2002, *Cano* (MUB 14055). Protoil on calcareous rocks.

New record for Murcia. A widespread species through most of Europe but confined to mountains in the Mediterranean region (Hill et al. 1991). In the southeastern Spain it has only been reported from Albacete (Jiménez & Ros 1984).

***Leiocolea turbinata*** (Raddi) H. Buch

Selected material studied: Alhama de Murcia, Sierra Espuña, Río Espuña, 30SXG2791, 900-1000

m, 30-I-1982, *Ros* (MUB 3567); Bullas, El Carrascalejo, 30SXH1313, 600 m, 21-I-1980, *Ros* (MUB 3318); Cehegín, Venta del Pino, 30SXH1006, 800 m, 5-II-1983, *Ros* (MUB 3229); Moratalla, cortijo de los Gorros, 30SWH9129, 800 m, 19-III-1984, *Ros* (MUB 3174). Edge of irrigation channels, banks of streams, wet talus.

Previous records: Allorge & Allorge (1946); Ros & Llimona (1984) sub *Lophozia turbinata*; Ros & Guerra (1987) sub *Lophozia turbinata*.

***Lunularia cruciata*** (L.) Lindb.

Selected material studied: Caravaca, Archivel, Río Argos, 30SWH9916, 600 m, 8-I-1983, *Ros* (MUB 3247); Cartagena, Sierra de la Muela, subida a la Sierra, 30SXG6862, 200 m, 7-III-1983, *Ros* (MUB 3750); Moratalla, Sierra de los Álamos, Cenajo del Agua Cernida, 30SWH8829, 1000 m, 16-III-1985, *Ros* (MUB 3506); Murcia, Sierra del Puerto, Puerto de la Cadena, 30SWH6197, 200 m, 2-III-1985, *Ros* (MUB 3466). Wet talus and soils near streams, and at edge of irrigation channels.

Previous records: Ros & Llimona (1984); Ros & Guerra (1987).

***Mannia androgyna*** (L.) A. Evans

Selected material studied: Cartagena, Isla del Ciervo, 30SXG9970, 0 m, 2-III-1980, *Ros* (MUB 535); Cieza, Cañón de Almadenes, 20-II-1997, *Sánchez-Moya* (MUB 6481); Murcia, Sierra de Columbares, 8-III-1980, *Llimona* (MUB 131). Fissures with soil accumulated on calcareous rocks.

Previous records: Allorge & Allorge (1946) sub *Grimaldia dichotoma*; Jovet-Ast & Bischler (1976) sub *Grimaldia dichotoma*; Alcaraz et al. (1982) sub *Grimaldia dichotoma*; Ros & Guerra (1987).

***Marchantia paleacea*** Bertol.

Selected material studied: Calasparra, 30SXH14, 400 m, *Ros* (MUB 4213); Caravaca, 30SWH9918, 600 m, 2-V-1982, *Aboal* (MUB 521). Edge of irrigation channels.

Previous records: Ros & Llimona (1984); Ros & Guerra (1987).

***Metzgeria furcata*** (L.) Dumort.

Studied material: Alhama de Murcia, Sierra de Carrascoy, Rambla de Roy, 30SXG5190, 900 m, 2-IV-1996, *Cano & Ros* (MUB 6037). Epiphyte on trunk of *Quercus rotundifolia*.

Previous record: Ros et al. (1996).

***Oxymitra incrassata*** (Broth.) Sérgio & Sim-Sim

Selected material studied: Cartagena, El Carmolí, 30SXG9073, 100 m, 2-III-1985, *Ros* (MUB 3563); Cartagena, Isla del Ciervo, 30SXG9970, 0 m, 29-XII-1984, *Ros* (MUB 1716); Murcia, Sierra de Columbares, 30SXG79, 400 m, 10-III-1980, *Llimona* & *Egea* (MUB 148). On open soils or soil between volcanic rocks.

Previous records: Alcaraz et al. (1982) sub *Tesselina pyramidata*; Ros & Guerra (1987) sub *Oxymitra paleacea*.

***Pellia endiviifolia*** (Dicks.) Dumort.

Selected material studied: Bullas, Río Mula, Salto Lucero (Usero), 30SXH1709, 600 m, 6-III-1981, *Ros* (MUB 322); Caravaca, Archivel, Las Oicas, Río Argos, 30SWH8915, 800 m, 18-III-1984, *Ros* (MUB 3179); Cehegín, Venta del Pino, 30SXH1006, 800 m, 8-XI-1981, *Ros* (MUB 523). Talus with seeping water, banks of streams and edge of irrigation channels.

Previous records: Allorge & Allorge (1946) sub *Pellia fabbroniana*; Ros & Llimona (1984) sub *P. endiviifolia* and *P. endiviifolia* f. *furcigera*; Ros & Guerra (1987).

***Plagiochasma rupestre*** (J.R. Forst. & G. Forst.) Steph.

Selected material studied: Alhama de Murcia, base de Pico Moriana, 30SXH3490, 450 m, 27-III-1998, *Cano* & *Ros* (MUB 15267); Cartagena, Puertos de Santa Barbara, 30SXH6568, 200 m, 2-III-1985, *García Pedreño* & *Gallego* (MUB 4013); Murcia, Torreaguera, Sierra de Mirete, 30SXH7105, 200 m, 1-IV-1982, *Martínez Fuertes* (MUB 679); Murcia, El Valle, 30SXG6399, 200 m, 30-I-1998, *Ros* & *Cano* (MUB 15467). Ledges and fissures with soil on calcareous rocks.

Previous records: Colmeiro (1889) sub *Plagiochasma aitonía*; Casares-Gil (1915); Allorge & Allorge (1946); Jovet-Ast & Bischler (1976); Ros & Guerra (1987).

***Porella platyphylla*** (L.) Pfeiff.

Selected material studied: Alhama de Murcia, Sierra de Carrascoy, Rambla de Roy, 27-II-1998, *Ros et al.* (MUB 15508); Moratalla, Sierra de los Álamos, Arroyo de la Celada, 30SWH9226, 1350 m, 2-V-2002, *Cano* (MUB 14089); Mula, Sierra del Cambrón, Pico La Selva, 30SXG1498, 1387 m, 7-XII-2002, *Cano* (MUB 14133). Epiphyte on base of *Juniperus oxycedrus* and fissures and ledges on calcareous rocks.

Previous records: Alcaraz et al. (1982) sub *Madotheca platyphylla*; Ros & Llimona (1984); Ros & Guerra (1987).

***Reboulia hemisphaerica*** (L.) Raddi

Selected material studied: Alhama de Murcia, Sierra Espuña, Valle del Leiva, 30SXG3293, 750 m, 13-XI-1983, *Ros* (MUB 3208); Caravaca, Archivel, Loma Ancha, 30SWH8616, 920 m, 18-III-1984, *Ros* (MUB 3181); Cartagena, Sierra de la Muela, subida a la Sierra, 30SXG6862, 200 m, 7-III-1984, *Ros* (MUB 3978); Moratalla, Sierra de Villafuerte, Fuente de Cantalar, 1500 m, 17-V-2003, *Cano* (MUB 15281). Ledges and fissures with soil on rocks.

Previous records: Jovet & Bischler (1976); Ros & Llimona (1984); Ros & Guerra (1987).

***Riccia atromarginata*** Levier

Selected material studied: Alhama de Murcia, Sierra de Carrascoy, Barranco de la Murta, 30SXG4891, 500 m, 1-XI-1982, *Alcaraz* (MUB 750); Bullas, El Carrascalejo, 30SXH1313, 600 m, 25-IV-1982, *Ros* (MUB 697); Cartagena, pr. Cobaticas, 30SXH9664, 200 m, 2-III-2003, *Cano* (MUB 14516); Cartagena, carretera Portman-Los Belones, Rambla de la Carrasquilla, 30SXG9465, 100 m, 31-I-1981, *Ros* (MUB 3511); Murcia, El Valle, 30SXG6399, 200 m, 24-III-1984, *Ros* (MUB 4190). Open soils.

Previous records: Jovet-Ast & Bischler (1976); Ros & Llimona (1984); Ros & Guerra (1987).

***Riccia crozalsii*** Levier

Selected material studied: Las Torres de Cotillas, junto urbanización Los Romeros, Los Pulpites, 9-V-1993, *Ros* & *Werner* (MUB 4753). Open soils.

Previous records: Ros & Guerra (1987, 1988).

***Riccia crustata*** Trab.

Selected material studied: Cartagena, Boca Rambla, 30SXG8874, 0 m, 18-II-1984, *Ros* (MUB 1731); Cehegín, carretera Cehegín-Calasparra, 30SXH0419, 580 m, 7-I-1983, *Ros* (MUB 3383); Jumilla, Sierra del Carche, Cerro de la Sal, 30SXH4360, 600 m, 3-III-1985, *Ros* (MUB 2893); Moratalla, carretera Calasparra-Salmerón, pr. Pantano del Cenajo, 30SXH14, 400 m, 7-I-1983, *Ros* (MUB 1197). Saline and gypsiferous soils.

Previous record: Ros & Guerra (1987).

***Riccia gougetiana*** Durieu & Mont.

Selected material studied: Cartagena, El Carmolí, 30SXG9073, 100 m, 2-III-1985, *Ros* (MUB 3476); Cartagena, Isla del Ciervo, 30SXG9970, 0 m, 29-XII-1983, *Ros* (MUB 1236); Sierra Columbares, Fuente Columbares, 30SXG79, 400 m, 10-III-1980, *Ros* (MUB 144). Soils mainly on volcanic rocks.

Previous records: Alcaraz et al. (1982) sub *Riccia gougetiana* var. *erinacea*; Ros & Guerra (1987) sub *Riccia gougetiana* var. *armatissima*.

***Riccia lamellosa*** Raddi

Selected material studied: Bullas, Salto del Lucero (Usero), 30SXH1709, 600 m, 25-IV-1982, *Ros* (MUB 527); Cartagena, carretera Portman-Los Belones, Rambla de la Carrasquilla, 30SXG9465, 50 m, 30-I-1980, *Ros* (MUB 146); Mazarrón, Fuente de Meca, 30SXG4361, 250 m, 10-III-1984, *Ros* (MUB 1735); Murcia, El Valle, 30SXH6300, 100 m, 30-I-1998, *Ros* & Cano (MUB 15396); San Javier, Isla Grosa, 30SXG0278, 40 m, 8-II-1980, *Ros* & Aboal (MUB); Yecla, Arabí, 30SXH4984, 860 m, 17-XI-2002, *Cano* (MUB 14031). Open soils.

Previous records: Jovet & Bischler (1976); Alcaraz et al. (1982); Ros & Llimona (1984); Ros & Guerra (1987).

***Riccia michelii*** Raddi

Selected material studied: Cartagena, Calblanque, Salinas del Rasall, 30SXG9964, 0 m, *Ros* (MUB 2933); Murcia, carretera Murcia-San Javier, km 7 después del desvío, 30SXG7091, 190 m, 2-III-1985, *Ros* (MUB 1737); Sierra Espuña, Pico Mariana, 30SXG3491, 400 m, 24-II-1988, *Robledo* (MUB 13773). Open soils.

Previous records: Ros & Guerra (1987, 1988).

***Riccia nigrella*** DC.

Selected material studied: Caravaca, Archivel, Loma Ancha, 30SWH8616, 920 m, 10-III-1985, *Ros* (MUB 3502); Cartagena, Isla del Ciervo, 30SXG9970, 0 m, 13-II-1982, *Ros* (MUB 163); Cartagena, El Carmolí, 30SXG9073, 100 m, 2-III-1985, *Ros* (MUB 3477). Soil on volcanic rocks.

Previous records: Ros & Guerra (1987).

***Riccia sorocarpa*** Bisch.

Selected material studied: Bullas, El Carrascalejo, 30SXH1313, 600 m, 25-IV-1982, *Ros* & Aboal (MUB 528); Cartagena, Calblanque, Salinas del Rasall, 30SXG9964, 0 m, 20-II-1983, *Ros* (MUB 3744);

Cartagena, Isla del Ciervo, 30SXG9970, 0 m, 13-II-1982, *Ros* (MUB 164); San Javier, Isla Grossa, 30SXG0278, 40 m, 6-V-1983, *Ros* (MUB 2883); Las Torres de Cotillas, junto urbanización Los Romeros, Los Pulpites, 9-V-1993, *Ros* & Werner (MUB 4754). Open soils.

Previous records: Alcaraz et al. (1982); Ros (1984); Ros & Llimona (1984); Ros & Guerra (1987).

***Riccia trabutiana*** Steph.

Selected material studied: Cartagena, Isla del Ciervo, 30SXG9970, 0 m, 28-I-1985, *Ros* (MUB 1232); Cartagena, Cabo Tiñoso, próx. al Campillo, 30SXG6359, 100 m, 25-III-1984, *Ros* (MUB 1233). Open soils.

Previous records: Jovet-Ast & Bischler (1976); Ros & Guerra (1987).

***Riella cossoniana*** Trab.

Selected material studied: Blanca, El Rellano, 30SXH53, 250 m, Alcaraz & Ríos (MUB 3626). In temporary pond.

Previous record: Ros et al. (1996).

***Southbya nigrella*** (De Not.) Henriq.

Selected material studied: Caravaca, Archivel, Loma Ancha, 30SWH8616, 920 m, 10-III-1985, *Ros* (MUB 3526); Cartagena, Rambla del Cañar, Peñas Blancas, 30SXG6062, 100 m, 1-IV-1984, *Ros* (MUB 2899); Murcia, El Valle, 30SXH6300, 100 m, 30-I-1998, *Ros* & Cano (MUB 15414); Murcia, Sierra de Columbares, subida a la Sierra, 30SXG7299, 400 m, 15-III-1980, Alcaraz (MUB 147). Talus and fissures of rocks.

Previous records: Jovet-Ast & Bischler (1976); Alcaraz et al. (1982); Ros & Guerra (1987).

***Southbya tophacea*** (Spruce) Spruce

Selected material studied: Murcia, El Valle, 30SXH6300, 100 m, 30-I-1998, *Ros* & Cano (MUB 15474). Murcia, Sierra Altaona, 30SXG7600, 395 m, 28-III-2004, *Cano* (MUB 16686). Soil between rocks, and talus.

Previous records: Alcaraz et al. (1982); Ros & Guerra (1987).

***Targionia hypophylla*** L.

Selected material studied: Cartagena, El Carmolí, 30SXG9073, 100 m, 2-III-1985, *Ros* (MUB 2831); Murcia, Sierra del Puerto, Puerto de la Cadena,

30SWH6197, 200 m, 2-III-1985, *Ros* (MUB 2830); Lorca, Sierra de la Torrecilla, Los Majales, 30SXG0372, 600 m, 3-III-1984, *Ros* (MUB 2826); Moratalla, Sierra de los Álamos, Puerta de Moratalla, Río Benamor, 30SWH9130, 700 m, 19-III-1984, *Ros* (MUB 2828). Ledge and fissures with soil on calcareous rocks.

Previous records: Ade & Koppe (1942); Jovet-Ast & Bischler (1976); Alcaraz et al. (1982); Ros & Llimona (1984); Ros & Guerra (1987).

### Excluded or doubtful reports

#### Mosses

##### *Brachythecium velutinum* var. *laevisetum* Luisier

Allorge & Allorge (1946) cited this taxon from two localities in Murcia. One collection has been examined (Totana, Sierra Espuña, El Morrón, fissures rochers calcaires, 1500 m, *Allorge & Allorge*, PC) and proved to be *Brachythecium velutinum* var. *salicinum*. The other collection was not located in PC herbarium.

##### *Bryum caespitium* var. *comense* (Schimp.) Husn.

This species was reported by Rungby (1962) from La Fuensanta. After revision of the specimen kept at C [Fuensanta, *Rungby 2743*], it can only be referred to *Bryum radiculosum*.

##### *Bryum gemmiparum* De Not.

According to Ros & Guerra (1987), the specimen reported by Alcaraz et al. (1982) proved to be *Mniobryum delicatulum* (= *Pohlia melanodon*).

##### *Bryum rubens* Mitt.

This species was reported by Ros & Guerra (1987) from different localities in Murcia. We were only able to revise one of these specimens [Totana, Sierra Espuña, Valle del Leiva, 30SXG2890, 1100 m, 12-II-1984, *Ros* (MUB 3455)], which must be referred to *Bryum radiculosum*.

##### *Bryum ruderale* Crundw. & Nyholm

This species was reported by Ros & Guerra (1987) from different localities of Murcia. We were able to revise three specimens kept in the MUB herbarium under this name. Two of them [Lorca, Lomo de Bas, 30SXG3255, 300 m, 10-III-1984, *Ros* (MUB 3275); Moratalla, Cenajo de Agua Cernida, 30SWH8829,

1000 m, *Ros* (MUB 3433)] must be referred to *Bryum radiculosum*. The other specimen located [Isla Grosa, 30SXG0278, 6-V-1983, *Ros* (MUB 2886)] proved to be *Bryum* gr. *capillare*.

##### *Campylium calcareum* Crudw. & Nyholm

According to Ros & Guerra (1987), the specimen reported by Alcaraz et al. (1982) proved to be *Eurhynchium meridionale*.

##### *Campylium chrysophyllum* (Brid.) Lange

This species was reported by Alcaraz et al. (1982) and Ros & Guerra (1987). After revision of the only (badly preserved) specimen kept at MUB [Alhama de Murcia, Sierra Espuña, Valle del Leiva, 30SXG3293, 750 m, 20-V-1984, *Ros* (MUB 3455)], it must be referred to *Brachythecium* sp.

##### *Cirriphyllum crassinervium* (Taylor) Loeske & M. Fleisch.

Ros & Guerra (1987) reported this taxon from Sierra Espuña. After study of this specimen [Alhama de Murcia, Sierra de Carrascoy, Rambla de Roy, 30SXG5190, 700-900 m, 4-XII-1983, *Ros* (MUB 3218)], it proved to be *Scleropodium tourettii*.

##### *Cratoneuron filicinum* var. *fallax* (Brid.) G. Roth

Gil & Ruiz (1985) reported this species from «Fuentes del Marqués». We were not able to study the specimen which supports this record because it was not deposited at GDA.

##### *Dichodontium pellucidum* var. *flavescens* (Dicks. ex With.) Moore

According to Ros & Guerra (1987), the specimen reported by Ros & Llimona (1984) was a misidentification.

##### *Dicranella varia* (Hedw.) Schimp.

This was cited sub *Anisothecium varium* (Hedw.) Mitt. by Ros & Llimona (1984) and Ros & Guerra (1987). After revision of the specimens on which these records are based [Bullas, El Carrascalejo, 30SXH1313, 600 m, 24-XI-1981, *Ros* (MUB 335); Moratalla, Sierra de los Álamos, Arroyo de la Rogativa, 30SWH6825, 1100 m, 21-V-1983, *Ros* (MUB 2911)], they must be referred to *Dicranella howei*.

***Dicranella varia* var. *callistoma*** (Dicks. ex With.) Schimp.

Casas (1973) reported this taxon sub *Anisothecium varium* var. *callistomum* (Dicks. ex With.) Cas.-Gil. After revision of the only specimen from Murcia of this taxon kept in BCB [Entre Calasparra y Caravaca de la Cruz, 21-II-1973, Casas (BCB 12152)], it proved to be *Dicranella howei*, which was already indicated on the revision label in BCB.

***Didymodon ferrugineus*** (Schimp. ex Besch.) M.O. Hill

Ros & Llimona (1984) and Ros & Guerra (1987) sub *Didymodon rigidicaulis* (Müll. Hal.) K. Saito reported this species from diverse localities in the province. After revision of the material under this name in the MUB herbarium, they proved to be different species of *Didymodon*, but not *D. ferrugineus*.

***Entostodon fascicularis*** (Hedw.) Müll. Hal.

According to Casas et al. (1996), the specimen reported by Ros & Guerra (1987) as *Entostodon fascicularis* provided to be *E. durieui*.

***Entostodon muhlenbergii*** (Turner) Fife

Ros & Guerra (1987) reported this species sub *Funaria muhlenbergii* from Lorca, Cabezo de Calnegre. No specimen supporting this record has been located in MUB herbarium. Esteve & Cortés Latorre (1954) also cited this taxon sub *Funaria dentata* var. *mediterranea* (Lindb.) J.J. Amann. After revision of the only (poorly preserved) plant kept at MA in support of this record [Cartagena, El Llano, cerca de Portmán, en la Sierra de Cartagena, *Esteve Chueca* (MA 3937)], it must be referred to *Funaria pulchella*.

***Eurhynchium praelongum*** (Hedw.) Schimp.

This species was reported by Allorge & Allorge (1946) sub *Oxyrhynchium praelongum* (Hedw.) Warnst. from Sierra Espuña. No material has been found supporting this record at PC.

***Eurhynchium schleicheri*** (R. Hedw.) Milde

This species was reported by Ros & Guerra (1987) from Sierra de la Pila. No material has been found supporting this record.

***Eurhynchium striatum*** (Schreb. ex Hedw.) Schimp.

According to Ros & Guerra (1987), the specimen reported by Ros & Llimona (1984) from Salto del Lucero [Usero] (Bullas) proved to be *Eurhynchium hians*.

***Fissidens exilis*** Hedw.

This species was reported by Ros & Guerra (1987, 1988). After revision of the only (badly preserved) specimen kept at MUB [Abarán, Sierra de la Pila, Barranco de las Cabras, 30SXH5337, 22-I-1984, Ros (MUB 3432)], it must be referred to *Fissidens gr. bryoides*.

***Grimmia trichophylla*** Grev.

This species was reported by Ros & Llimona (1984) from Pico La Selva, Sierra de Ponce (Sierra del Cambrón). After revision of this specimen, according to Maier (2002) [Sierra de Ponce, la Selva, 30SXH1598, 1100-1200 m, 7-XI-1981, Ros (MUB 426)], it proved to be *Grimmia dissimulata*.

***Gyroweisia reflexa*** (Brid.) Schimp.

Ade & Koppe (1942) reported this species from «Fuensanta nachst Murcia». We could not find the specimen which supports this record. It was not deposited at the Koppe herbarium at STU. It may well have been deposited in the herbarium of Ade, and was destroyed in the World War II in Würzburg (Martin Nebel, in litt.). We had no success either in M, where some collections from the herbarium of Ade are deposited.

***Hypnum cupressiforme* var. *mammillatum*** Brid.

This was cited by Alcaraz et al. (1982) and compiled by Ros & Guerra (1987). After revision of the specimen kept at MUB under this name [Totana, Sierra Espuña, Valle del Río Espuña, 30SXG3091, 800 m, Alcaraz (MUB 77)], it must be referred to *Hypnum cupressiforme* var. *lacunosum*.

***Hypnum cupressiforme* var. *subjulaceum*** Molendo

This was cited by Alcaraz et al. (1982) and Ros & Guerra (1987). After revision of the specimens on which this record is based [Fortuna, Sierra de La Pila, Peña Bermeja, 30SXH5840, 750 m, 19-VII-1978, Alcaraz (MUB 4); Fortuna, Sierra de La Pila, Rambla del Comisario, 30SXH5934, 800 m, 2-IV-1984, Alcaraz (MUB 16); Jumilla, Sierra del Carche, 30SXH6055, Alcaraz & Llimona (MUB 137)], they proved to be *Hypnum cupressiforme* var. *lacunosum*.



***Orthotrichum pallens*** Bruch ex Brid.

This was reported for Murcia by Alcaraz et al. (1982). However, after revision of the specimen (badly preserved) on which this record is based [Sierra de Carrascoy, Rambla de Roy, 30SXG5189, 1-II-1980, Alcaraz (MUB 107)], the material proved to be *Orthotrichum affine*, mixed with *O. diaphanum*.

***Plagiomnium medium*** (Bruch & Schimp.) T.J. Kop.

According to Ros et al. (1996) and Gómez-Menor et al. (1999), the specimen reported by Ros & Guerra (1985) as *Plagiomnium medium* [Moratalla, Sierra de los Alamos, Cenajo del Agua Cernida, 30SWH8829, 1000 m, 30-X-1982, Egea & Ciller (MUB 841)] is *P. undulatum*.

***Pottia intermedia*** (Turner) Fürnr.

This was cited by Ros & Guerra (1985, 1987) from several localities in the province. We were only able to study one sample on which this record is based [San Javier, Isla Grossa, 30SXG9970, 30 m, 8-II-1980, Aboal & Ros (MUB 777)]. After revision of this material, it proved to be *Pottia pallida*.

***Pottia truncata*** var. *littoralis* (Mitt.) Warnst.

Reported by Ros & Guerra (1987) from Cartagena, Cruce Cartagena-Los Urrutias. No specimen supporting this record has been located.

***Schistidium apocarpum*** (Hedw.) Bruch & Schimp.

This species was reported by Ros & Llimona (1984) and Ros & Guerra (1987). After revision of the specimens kept at MUB under this name, they must be referred to *Schistidium crassipilum* or *S. singarense*.

***Schistidium apocarpum*** subsp. *atrofusum* (Schimp.) Loeske

This species was reported by Ros & Guerra (1987) from one locality [Totana, Sierra Espuña, pr. Río Espuña, 30SXG2890, 1100 m, 12-II-1984, Ros (MUB 3423)]. After revision of this material, it proved to be *Schistidium singarense*.

***Schistidium confertum*** (Funck) Bruch & Schimp.

This species was reported by Ros & Llimona (1984) sub *Schistidium apocarpum* var. *confertum* (Funck) H. Möller and Ros & Guerra (1987) sub *Schistidium apocarpum* subsp. *confertum* (Funck)

Loeske. After revision of the specimens which support this record, they proved to be *Schistidium singarense*.

***Tortella inclinata*** (R. Hedw.) Limpr.

Ros & Llimona (1984) and Ros & Guerra (1987) reported this species from different localities from Murcia. Revision of the material under this name kept at MUB showed it to be *Tortella flavovirens*, *T. humilis* and *Trichostomum* sp.

***Tortella inflexa*** (Bruch) Broth.

This was reported by Casas et al. (1989) from Cartagena [Sierra de la Muela, 1983, Ros (MUB 1240)]. No material has been found at MUB herbarium to support this record.

***Tortula muralis*** var. *aestiva* Brid. ex Hedw.

Ros & Guerra (1985, 1987) reported this taxon from different localities in Murcia. No material has been found to support this record.

## Liverworts

***Calypogeia azurea*** Stotler & Crotz

According to Ros & Guerra (1987), the specimen reported by Alcaraz et al. (1982) sub *Calypogeia trichomanis* auct. is *Porella platyphylla*.

***Cephalozia bicuspadata*** (L.) Dumort.

This species was reported by Alcaraz et al. (1982) but, according to Ros & Guerra (1987), the specimen is *Cephaloziella baumgartneri*.

***Cephaloziella stellulifera*** (Taylor ex Spruce) Schiffn.

This was reported from La Unión by Sánchez-Moya & Cano (1999). After revision of the sterile material of this species deposited at MUB [Sierra de Carrascoy, Rambla de Roy, 27-II-1998, Ros et al. (MUB 15508); La Unión, Monte Sancti Spiritu, 30SXG8864, 350 m, 10-III-1998, Sánchez-Moya (MUB 15083)] by M. Infante (Museo de Ciencias Naturales de Álava) she thinks that it is not *C. stellulifera*, although because both specimens are sterile, it is not possible to be sure of their identity.

***Fossombronia caespitiformis*** var. *subcristata* Schiffn.

Ros & Guerra (1987) reported this taxon from Cabo Tiñoso, pr. Campillo. No material has been found to support this record.

***Porella obtusata*** (Taylor) Trevis.

Ros & Guerra (1987) reported this taxon from Moratalla. After revision of the specimens which support this record [Moratalla, Sierra de los Álamos, Cenajo de Agua Cernida, 30SWH8829, 30-IV-1981, Ros (MUB 2875); ibidem 30-X-1982, Egea & Ciller (MUB 760)], they must be referred to *Porella platyphylla*.

**List of synonyms****Mosses**

*Aloina aloides* var. *ambigua* = ***Aloina ambigua*** (Bruch & Schimp.) Limpr.

*Aschisma carniolicum* var. *speciosum* Limpr. = ***Aschisma carniolicum*** (F. Weber & D. Mohr) Lindb.

*Barbula convoluta* var. *commutata* (Jur.) Husn. = ***Barbula convoluta*** var. *sardoa* Bruch & Schimp.

*Barbula ehrenbergii* (Lorentz) M. Fleisch. = ***Barbula bolleana*** (Müll. Hal.) Broth.

*Barbula fallax* Hedw. = ***Didymodon fallax*** (Hedw.) R.H. Zander

*Barbula hornschuchiana* Schultz = ***Pseudocrossidium hornchuchianum*** (Schultz) R.H. Zander

*Barbula revoluta* Brid. = ***Pseudocrossidium revolutum*** (Brid.) R.H. Zander

*Barbula rigidula* (Hedw.) Mitt. = ***Didymodon rigidulus*** Hedw.

*Barbula vinealis* Brid. = ***Didymodon vinealis*** (Brid.) R.H. Zander

*Brachythecium velutinum* subsp. *salicinum* (Schimp.) J.J. Amann = ***Brachythecium velutinum*** var. *salicinum* (Bruch & Schimp.) Mönk.

*Bryum bicolor* Dicks. = ***Bryum dichotomum*** Hedw.

*Bryum canariense* Brid. = ***Rosulabryum canariense*** (Brid.) Ochyra

*Bryum capillare* Hedw. = ***Rosulabryum capillare*** (Hedw.) J.R. Spence

*Bryum capillare* var. *flaccidum* auct. = ***Rosulabryum laevifilum*** (Syed) Ochyra

*Bryum capillare* f. *longipilum* Podp. = ***Rosulabryum capillare*** (Hedw.) J.R. Spence.

*Bryum capillare* subsp. *torquescens* (Bruch ex De Not.) Kindb. = ***Rosulabryum torquescens*** (Bruch ex De Not.) J.R. Spence

*Bryum donianum* Grev. = ***Rosulabryum donianum*** (Grev.) Ochyra

*Bryum dunense* A.J.E. Smith & H. Whitehouse = ***Bryum dichotomum*** Hedw.

*Bryum flaccidum* auct. = ***Rosulabryum laevifilum*** (Syed) Ochyra

*Bryum murorum* (Schimp.) Berk. = ***Bryum radiculosum*** Brid.

*Bryum torquescens* Bruch ex De Not. = ***Rosulabryum torquescens*** (Bruch ex De Not.) J.R. Spence

*Bryum versicolor* (A. Braun) Bruch & Schimp. = ***Bryum dichotomum*** Hedw.

*Camptothecium aureum* (Spruce) Schimp. = ***Homalothecium aureum*** (Spruce) H. Rob.

*Cratoneuron commutatum* (Hedw.) G. Roth. = ***Palustriella commutata*** (Hedw.) Ochyra

*Crossidium chloronotos* auct. = ***Crossidium crassinerve*** (De Not.) Jur.

*Crossidium laxefilamentosum* W. Frey & Kürschner = ***Crossidium crassinerve*** (De Not.) Jur.

*Didymodon aaronis* (Lorentz) J. Guerra = ***Didymodon australasiae*** (Hook. & Grev.) R.H. Zander

*Didymodon trifarius* auct. = ***Didymodon luridus*** Hornch. ex Spreng.

*Didymodon trivialis* (Müll. Hal.) J. Guerra = ***Didymodon australasiae*** (Hook. & Grev.) R.H. Zander

*Ditrichum flexicaule* f. *densum* (Bruch & Schimp.) Mönk. = ***Ditrichum flexicaule*** (Schwägr.) Hampe

*Encalypta contorta* Hoppe ex Lindb. = ***Encalypta streptocarpa*** Hedw.

*Entosthodon curvisetus* (Schwägr.) Müll. Hal. = ***Funariella curviseta*** (Schwägr.) Sérgio

*Entosthodon pallescens* Jur. = ***Entosthodon durieui*** Mont.

*Fissidens crassipes* var. *philibertii* Besch. = ***Fissidens crassipes*** subsp. *warnstorffii* (M. Fleisch.) Brugg.-Nann.

*Fissidens cristatus* Wilson & Mitt. = ***Fissidens dubius*** P. Beauv.

*Fissidens incurvus* Starke ex Röhl. = ***Fissidens bryoides*** Hedw.

*Fissidens viridulus* (Sw.) Wahlenb. = ***Fissidens bryoides*** Hedw.

*Fissidens viridulus* var. *bambergeri* (Schimp.) Waldh. = ***Fissidens bryoides*** Hedw.

*Fissidens warnstorffii* M. Fleisch. = ***Fissidens crassipes*** subsp. *warnstorffii* (M. Fleisch.) Brugg.-Nann.

- Fontinalis hypnoides* var. *duriaei* (Schimp.) Husn. = ***Fontinalis duriaei*** Schimp.
- Funaria curviseta* (Schwägr.) Milde = ***Funariella curviseta*** (Schwägr.) Sérgio
- Funaria pulchella* H. Philib. = ***Entosthodon pulchellus*** (H. Philib.) Brugués
- Grimmia pitardii* Corb. = ***Campylostelium pitardii*** (Corb.) E. Maier
- Grimmia pulvinata* var. *africana* (Hedw.) Wilson = ***Grimmia pulvinata*** (Hedw.) Sm.
- Gymnostomum luisieri* (Sérgio) Sérgio ex Crundw. = ***Gymnostomum viridulum*** Brid.
- Gymnostomum recurvirostrum* Hedw. = ***Hymenostylium recurvirostrum*** (Hedw.) Dixon
- Homalothecium sericeum* f. *robustum* (Warnst.) Podp. = ***Homalothecium sericeum*** (Hedw.) Schimp.
- Hymenostomum tortile* (Schwägr.) Bruch & Schimp = ***Weissia condensa*** (Voit) Lindb. var. ***condensa***
- Hypnum cupressiforme* var. *tectorum* Brid. = ***Hypnum cupressiforme*** var. ***lacunosum*** Brid.
- Leptodictyum kochii* (Schimp.) Warnst. = ***Leptodictyum humile*** (P. Beauv.) Ochyra
- Mniobryum delicatulum* (Hedw.) Dixon = ***Pohlia melanodon*** (Brid.) A.J. Shaw
- Orthotrichum cupulatum* var. *sardagnanum* (Venturi) Venturi = ***Orthotrichum cupulatum*** Brid.
- Oxyrhynchium swartzii* var. *meridionale* (Boulay) Pavletic = ***Eurhynchium hians*** var. ***rigidum*** (Boulay) J.-P. Frahm
- Phascum curvicolle* Hedw. = ***Microbryum curvicolle*** (Hedw.) R.H. Zander
- Phascum cuspidatum* subsp. *papillosum* (Lindb.) J. Guerra & Ros = ***Phascum cuspidatum*** var. ***papillosum*** (Lindb.) G. Roth
- Phascum floerkeanum* F. Weber & D. Mohr = ***Microbryum floerkeanum*** (F. Weber & D. Mohr) Schimp.
- Phascum leptophyllum* Müll. Hal. = ***Leptophascum leptophyllum*** (Müll.Hal.) J. Guerra & M.J. Cano
- Pottia bryoides* (Dicks.) Mitt. = ***Protobryum bryoides*** (Dicks.) J. Guerra & M.J. Cano
- Pottia caespitosa* (Bruch) Müll. Hal. = ***Pottiopsis caespitosa*** (Bruch) Blockeel & A.J.E. Sm.
- Pottia commutata* Limpr. = ***Microbryum davallianum*** (Sm.) R.H. Zander
- Pottia davalliana* (Sm.) C.E.O. Jensen = ***Microbryum davallianum*** (Sm.) R.H. Zander
- Pottia mutica* Venturi = ***Microbryum starkeanum*** (Hedw.) R.H. Zander
- Pottia starkeana* (Hedw.) Müll. Hal. = ***Microbryum starkeanum*** (Hedw.) R.H. Zander
- Pottia starkeana* subsp. *conica* (Schleich. ex Schwägr.) D.F. Chamb. = ***Microbryum davallianum*** (Sm.) R.H. Zander
- Pottia starkeana* subsp. *minutula* (Schwägr.) D.F. Chamb. = ***Microbryum davallianum*** (Sm.) R.H. Zander
- Pterogonium ornithopodioides* (F. Weber & D. Mohr) Lindb. = ***Pterogonium gracile*** (Hedw.) Sm.
- Rhynchostegiella tenella* var. *litorea* (De Not.) P.W. Richards & E.C. Wallace = ***Rhynchostegiella litorea*** (De Not.) Limpr.
- Rhynchostegiium riparioides* (Hedw.) Cardot = ***Platyhypnidium riparioides*** (Hedw.) Dixon
- Scleropodium illecebrum* Schimp. = ***Scleropodium touretii*** (Brid.) L.F. Koch
- Tortella densa* (Lorentz & Molendo) Crundw. & Nyholm. = ***Tortella inclinata*** var. ***densa*** (Lorentz & Molendo) Limpr.
- Tortella tortuosa* var. *brevifolia* Breidl. = ***Tortella tortuosa*** (Hedw.) Limpr.
- Tortula baetica* (Casas & R. Oliva) J. Guerra & Ros = ***Tortula israelis*** Bizot & F. Bilewsky
- Tortula calcicolens* W.A. Kramer = ***Syntrichia calcicola*** J.J. Amann
- Tortula caninervis* (Mitt.) Broth. = ***Syntrichia caninervis*** Mitt
- Tortula intermedia* (Brid.) De Not. = ***Syntrichia montana*** Nees
- Tortula laevipila* (Brid.) Schwägr. = ***Syntrichia laevipila*** Brid.
- Tortula montana* (Nees) Lindb. = ***Syntrichia montana*** Nees
- Tortula muralis* f. *incana* (Bruch & Schimp.) Sapjegin = ***Tortula muralis*** Hedw.
- Tortula muralis* var. *baetica* Casas & R. Oliva = ***Tortula israelis*** Bizot & F. Bilewsky
- Tortula muralis* var. *incana* (Bruch & Schimp.) Wilson = ***Tortula muralis*** Hedw.
- Tortula muralis* var. *obcordata* (Schimp.) Limpr. = ***Tortula muralis*** Hedw.
- Tortula pagorum* (Milde) De Not. = ***Syntrichia laevipila*** Brid.
- Tortula princeps* De Not. = ***Syntrichia princeps*** (De Not.) Mitt.
- Tortula revolvens* var. *obtusata* Reimers = ***Tortula revolvens*** (Schimp.) G. Roth

*Tortula ruraliformis* (Besch.) Grout = ***Syntrichia ruralis*** var. ***ruraliformis*** (Besch.) Delogne

*Tortula ruraliformis* var. *subpapillosissima* Bizot & R.B. Pierrot ex W.A. Kramer = ***Syntrichia subpapillosissima*** (Bizot & R.B. Pierrot ex W.A. Kramer) M.T. Gallego & J. Guerra

*Tortula ruralis* (Hedw.) P. Gaertn., B. Mey & Scherb. = ***Syntrichia ruralis*** (Hedw.) F. Weber & D. Mohr

*Trichostomum brachydontium* subsp. *cuspidatum* (Braithw.) Giacom. = ***Trichostomum brachydontium*** Bruch

*Trichostomum brachydontium* subsp. *densum* (Bruch & Schimp.) Giacom. = ***Trichostomum brachydontium*** Bruch

*Trichostomum brachydontium* subsp. *mutabile* (Bruch) Giacom. = ***Trichostomum brachydontium*** Bruch

*Trichostomum brachydontium* subsp. *unguiculatum* (H. Philib.) Corb. & Jahand. = ***Trichostomum brachydontium*** Bruch.

*Trichostomum caespitosum* (Bruch) Jur. = ***Pottiopsis caespitosa*** (Bruch) Blockeel & A.J.E. Sm.

*Trichostomum mutabile* Bruch = ***Trichostomum brachydontium*** Bruch

*Trichostomum mutabile* var. *densum* Bruch & Schimp. = ***Trichostomum brachydontium*** Bruch

*Trichostomum triumphans* var. *pallidisetum* (Müll.Hal.) Husn. = ***Trichostomum triumphans*** De Not.

*Trichostomum viridulum* var. *unguiculatum* (H. Philib.) Esteve & C. Cortés = ***Trichostomum brachydontium*** Bruch.

*Weissia longifolia* Mitt. = ***Astomum crispum*** (Hedw.) Hampe.

*Weissia triumphans* var. *pallidisetum* (H. Müll.) Düll = ***Trichostomum triumphans*** De Not.

*Zygodon baumgartneri* Malta = ***Zygodon rupestris*** Schimp. ex Lorentz

#### Liverworts

*Grimaldia dichotoma* Raddi = ***Mannia androgyna*** (L.) A. Evans

*Lophozia turbinata* (Raddi) Steph. = ***Leiocolea turbinata*** (Raddi) H. Buch

*Madotheca platyphylla* (L.) Dumort. = ***Porella platyphylla*** (L.) Pfeiff.

*Oxymitra paleacea* Bisch. = ***Oxymitra incrassata*** (Broth.) Sérgio & Sim-Sim

*Pellia endiviifolia* f. *furcigera* (Hook.) Schiffn. = ***Pellia endiviifolia*** (Dicks.) Dumort.

*Pellia fabbroniana* Raddi = ***Pellia endiviifolia*** (Dicks.) Dumort.

*Plagiochasma aitonina* Lindenb. & Nees = ***Plagiochasma rupestre*** (J.R. Forst & G. Forst) Steph.

*Riccia gougetiana* var. *erinacea* Schiffn. = ***Riccia gougetiana*** Durieu & Mont.

*Riccia gougetiana* var. *armatissima* Levier ex Müll. Frib. = ***Riccia gougetiana*** Durieu & Mont.

*Tesselina pyramidata* (Willd.) Dumort. = ***Oxymitra incrassata*** (Broth.) Sérgio & Sim-Sim

#### Acknowledgements

We would like to thank all those who have helped us by identifying or confirming specimens: D. Griffin (*Philonotis fontana*), M. Infante (*Cephaloziella, Porella*), E. Maier (*Grimmia dissimulata*), F. Puche (*Tortella inclinata* var. *densa*), I. Draper, R. Garilleti and F. Lara (some *Orthotrichum* species). Also, we are grateful to M. C. Sánchez-Moya for her assistance in the field, the curators of C, GDA, M, MA, M, and Martin Nebel at STU for their help with the location and loans of specimens and the staff of the Bryology Laboratory at the Universidad Autónoma de Barcelona and C. Rausch, A. Couté, D. Lamy and the rest of the staff at the Bryology Laboratory from PC for their hospitality and assistance during the visits of the first author to BCB and PC herbaria. The visit to PC herbarium was funded by the Colparsyst Program. Financial support was provided by the Fundación Séneca of Murcia [PI-15/00762/FS/01-Project 4631].

#### References

- Ade A & Koppe F. 1942. Beitrag zur Kenntnis der Moosflora der atlantischen Inseln und der pyrenäischen Halbinsel. *Hedwigia* 81: 1-36.
- Alcaraz F, Ros RM, Egea JM & Llimona X. 1982. Contribución al conocimiento de la flora briofítica del Sureste de España. *Collectanea Botanica* 13: 129-142.
- Aleffi M, Sabovljevic M & Tacchi R. 2004. *Gymnostomum lanceolatum* M.J. Cano, Ros & J. Guerra (Pottiaceae, Musci), new to Italy. *Cryptogamie, Bryologie* 25: 175-177.
- Allorge V & Allorge P. 1946. Notes sur la flore bryologique de la Péninsule Ibérique. X.- Muscinées du Sud et de l'Est de l'Espagne. *Revue Bryologique Lichénologique* 15: 172-200.
- Blockeel TL, Ros RM, Sabovljevic M, Cano MJ, Gallego MT & Muñoz J. 2002. New and interesting bryophy-

- te records for Greece. *Cryptogamie, Bryologie* 23: 149-155.
- Brugués M. 1998. The Identity of *Entosthodon durieui* and *E. pallescens*. *The Bryologist* 101: 133-136.
- Brugués M. 2003. Key to the Funariales of the Iberian Peninsula and Balearic Islands. *Cryptogamie, Bryologie* 24: 59-70.
- Cano MJ, Guerra J & Ros RM. 1993. A revision of the moss genus *Crossidium* (Pottiaceae) with the description of the new genus *Microcrossidium*. *Plant Systematics and Evolution* 188: 213-23.
- Cano MJ, Ros RM & Guerra J. 1994. *Gymnostomum lanceolatum* sp. nov. (Pottiaceae, Musci) von der Iberischen Halbinsel. *Nova Hedwigia* 59: 143-146.
- Cano MJ & García-Zamora P. 1995. Adiciones a la flora briofítica del sudeste de España. *Cryptogamie, Bryologie et Lichénologie* 16: 145-149.
- Cano MJ, Ros RM & Guerra J. 1996. Flora briofítica de la provincia de Alicante. *Cryptogamie, Bryologie et Lichénologie* 17: 251-277.
- Cano MJ, Ros RM & Guerra J. 1999. The identity of *Entosthodon hungaricus* (Boros) Loeske and *E. maroccanus* (Meyl.) Hébr. & Lo Giudice (= *Physcomitrium maroccanum* Meyl.). *Journal of Bryology* 21: 67-70.
- Cano MJ, Ros RM & Guerra J. 2000. Identity of North African endemic bryophytes 1. *Journal of Bryology* 22: 269-272.
- Cano MJ, Gallego MT, Garilleti R, Juaristi R, Lara F, Martínez-Abaigar J, Mazimpaka V, Roselló JA, Sánchez-Moya MC & Urdiroz A. 2001. Aportaciones al conocimiento de la flora briológica española. Notula XIII: Hepáticas y musgos de Mallorca (Islas Baleares). *Boletín de la Sociedad Española de Briología* 18/19: 103-110.
- Cano MJ, Ros RM, Gallego MT, Jiménez JA & Guerra J. 2002. Contribution to the bryophyte flora of Morocco: the Anti-Atlas catalogue. *Cryptogamie, Bryologie* 23: 249-262.
- Cano MJ. 2004. Pottiaceae: *Hennediella*, *Tortula*. In *Flora Briofítica Ibérica* (Guerra J & Cros RM, coord./eds.). Murcia: Sociedad Española de Briología.
- Carrión JS, Guerra J & Ros RM. 1990. Spore morphology of the European species of *Phascum* Hedw. (Pottiaceae, Musci). *Nova Hedwigia* 51: 411-433.
- Carrión JS, Cano MJ & Guerra J. 1995. Spore morphology in the moss genus *Pterygoneurum* Jur. (Pottiaceae). *Nova Hedwigia* 61: 481-496.
- Casares-Gil A. 1915. Enumeración y distribución geográfica de las muscíneas de la Península Ibérica. *Trabajos del Museo Nacional de Ciencias Naturales, serie botánica* 8: 1-179.
- Casas C. 1973. Datos para la flora briológica española. Algunos musgos y hepáticas del sureste de España. *Revista da Faculdade de Ciências de Lisboa* 17: 603-616.
- Casas C, Brugués M, Cros RM & Sérgio C. 1985. Cartografía de briòfits. Península Ibèrica i les Illes Balears, Canàries, Açores i Madeira. Fascicle I: 1-50. Barcelona: Institut d'Estudis Catalans.
- Casas C. 1986. *Briotheca Hispanica*. *Acta Botanica Malacitana* 11: 83-112.
- Casas C, Brugués M, Cros RM & Sérgio C. 1989. Cartografía de briòfits. Península Ibèrica i les Illes Balears, Canàries, Açores i Madeira. Fascicle II: 51-100. Barcelona: Institut d'Estudis Catalans.
- Casas C, Brugués M, Cros RM & Sérgio C. 1992. Cartografía de briòfits. Península Ibèrica i les Illes Balears, Canàries, Açores i Madeira. Fascicle III: 101-150. Barcelona: Institut d'Estudis Catalans.
- Casas C, Cros RM & Brugués M. 1993. *Crossidium laevipilum* Thèr. & Trab. A la comarca de la Terra Alta (Tarragona). *Orsis* 8: 143-146.
- Casas C & Brugués M. 1995. Nota briològica. Dues aportacions de J. Vives a la briologia catalana. *Orsis* 10: 123-125.
- Casas C, Brugués M, Cros RM & Sérgio C. 1996. Cartografía de briòfits. Península Ibèrica i les Illes Balears, Canàries, Açores i Madeira. Fascicle IV: 151-200. Barcelona: Institut d'Estudis Catalans.
- Casas C. 2000. El género *Schistidium* Bruch & Schimp. en España. *Boletín de la Sociedad Española de Briología* 16: 1-9.
- Casas C, Brugués M & Cros RM. 2001. Flora dels Briòfits dels Països Catalans. Barcelona: Institut d'Estudis Catalans.
- Colmeiro M. 1889. Enumeración y revisión de las plantas de la Península Hispano-Lusitana e Islas Baleares. Vol. 5. Madrid, pp. 473-571.
- Corley MFV, Crundwell AC, Düll R, Hill MO & Smith AJE. 1981. Mosses of Europe and the Azores; an annotated list of species, with synonyms from the recent literature. *Journal of Bryology* 11: 609-689.
- Cortés Latorre C. 1955. Aportaciones a la briología española. (Dos musgos nuevos para la flora española). *Anales Instituto Botánico A.J. Cavanilles* 13: 1-13.
- Cortini-Pedrotti C. 2001. Flora dei muschi d'Italia. Sphagnopsida, Andreopsida, Bryopsida (I Parte). Roma: Antonio Delfino editore.
- Crosby MR, Magill RE, Allen B & He S. 1999. A checklist of the mosses. St. Louis: Missouri Botanical Garden.
- Draper I, Lara F, Albertos B, Garilleti R & Mazimpaka V. 2003. The epiphytic bryoflora of the Jbel Bouhalla (Rif, Morocco) including a new variety of moss, *Orthotrichum speciosum* var. *brevisetum*. *Journal of Bryology* 25: 271-280.
- Esteve F & Cortés Latorre C. 1954. El estrato liquénico-muscinal en la durilignosa de la Sierra de Cartagena. *Anales Instituto Botánico A.J. Cavanilles* 13: 121-128.

- Frahm JP. 1976. *Hypnum lacunosum* (Brid.) Hoffm. var. *tectorum* (Brid.) nov. comb. *Herzogia* 4: 161-166.
- Frahm JP & Ahmed J. 2004. *Barbula sardoa* (Schimp.) J.-P. Frahm, a new name for *Barbula convoluta* Hedw. var. *commutata* (Jur.) Husn. *Journal of Bryology* 26: 29-35.
- Fuertes E. 1983. El género *Crossidium* Jur. en la Península Ibérica, Islas Baleares, Canarias y Madeira. *Anales del Jardín Botánico de Madrid* 40: 29-35.
- Fuertes E, Velázquez R, Marcos N & Rubio A. 1997. Revisión y corología de *Leucodon sciuroides* y var. *morensis* (Bryophyta) en la Península Ibérica. *Studia Botanica* 16: 5-22.
- Gallego MT & Cano MJ. 2000. Pottiaceae: Género modelo *Aloina* (Pottiaceae). In *Flora Briofítica Ibérica* (Guerra J & Cros RM, coords./eds.). Murcia: Sociedad Española de Briología.
- Gallego MT. 2002. Pottiaceae: *Syntrichia*. In *Flora Briofítica Ibérica* (Guerra J & Cros RM, coords./eds.). Murcia: Sociedad Española de Briología.
- Gallego MT, Cano MJ, Ros RM & Guerra J. 2002a. An overview of *Syntrichia ruralis* complex (Pottiaceae, Musci) in the Mediterranean region and neighbouring areas. *Botanical Journal of the Linnean Society* 138: 209-224.
- Gallego MT, Cano MJ, Ros RM & Guerra J. 2002b. New taxonomic data on a Circum-Tethyan group of *Syntrichia* (Pottiaceae, Bryophyta): the *S. caninervis* complex. *Systematic Botany* 27: 643-653.
- Gallego MT, Cano MJ & Guerra J. 2004. A taxonomic study of *Syntrichia laevipila* (Pottiaceae, Musci) complex. *Journal of the Botanical Linnean Society* 145: 219-230.
- García-Zamora P, Ros RM & Guerra J. 1998. Bryophyte flora of the Sierra de Filabres, Cabrera, Alhamilla and Cabo de Gata (Almería, SE Spain). *Journal of Bryology* 20: 461-493.
- Gil JA & Ruiz P. 1985. The aquatic basophilous bryophytic communities of south east Spain. *Herzogia* 7: 211-228.
- Gómez-Menor JM, Fuertes E & Acón M. 1999. *Plagiomnium* T. Kop. (Plagiomniaceae, Musci) en la Península Ibérica e Iles Balears. *Lazaroa* 20: 11-28.
- Grolle R & Long DG. 2000. An annotated check-list of the Hepaticae and Anthocerotae of Europe. *Journal of Bryology* 22: 103-140.
- Guerra J & Puche F. 1984. *Bryum dunense* Smith & Whitehouse en la Península Ibérica y Baleares. Observaciones taxonómicas, corológicas y fitosociológicas. *Acta Botanica Malacitana* 9: 85-92.
- Guerra J & Ros RM. 1987. Revisión de la sección *Asteriscium* del género *Didymodon* (Pottiaceae, Musci) (= *Trichostomopsis*) en la Península Ibérica. *Cryptogamie, Bryologie et Lichénologie* 8: 47-68.
- Guerra J & Ros RM. 1988. Caracterización taxonómica, corología y ecología de *Pottia pallida* Lindb. relaciones con otras especies. *Cryptogamie, Bryologie et Lichénologie* 9: 343-352.
- Guerra J, Ros RM, De las Heras J, García-Zamora P & Jiménez N. 1989. Estudio de la flora briofítica de la Sierra de Alcaraz (Albacete) como base para una evaluación fitobiológica del territorio. Instituto de Estudios Albacetenses. Serie I-Ensayos Históricos y Científicos 39: 1-117.
- Guerra J, Jiménez MN, Ros RM & Carrión JS. 1991. El género *Phascum* (Pottiaceae) en la Península Ibérica. *Cryptogamie, Bryologie et Lichénologie* 12: 379-423.
- Guerra J, Ros RM & Carrión JS. 1992. The taxonomic status of *Tortula muralis* var. *baetica* (Musci, Pottiaceae): a comparative study. *Journal of Bryology* 17: 275-283.
- Guerra J, Ros RM, Martínez-Sánchez JJ, de las Heras J, Herranz JM & Cano MJ. 1993. Flora y vegetación briofítica de las zonas yesíferas de la provincia de Albacete. *Al-Basit* 32: 39-62.
- Guerra J, Cano MJ & Ros RM. 1995. El Género *Pterygoneurum* Jur. (Pottiaceae, Musci) en la Península Ibérica. *Cryptogamie, Bryologie et Lichénologie* 16: 165-175.
- Guerra J & Cros RM (coords./eds.). 2000-2004. *Flora Briofítica Ibérica*. Murcia: Sociedad Española de Briología.
- Guerra J. 2002. Pottiaceae: *Weissia*, *Astomum*, *Trichostomum*. In *Flora Briofítica Ibérica* (Guerra J & Cros RM, coords./eds.). Murcia: Sociedad Española de Briología.
- Guerra J. 2003. Pottiaceae: *Phascum*, *Acaulon*, *Aschisma*, *Protobryum*, *Leptophascum*. In *Flora Briofítica Ibérica* (Guerra J & Cros RM, coords./eds.). Murcia: Sociedad Española de Briología.
- Guerra J. 2004. Pottiaceae: *Gymnostomum*, *Hymenostylium*, *Gyroweisia*, *Leptobarbula*. In *Flora Briofítica Ibérica* (Guerra J & Cros RM, coords./eds.). Murcia: Sociedad Española de Briología.
- Heras J de las & Ros RM. 1986. Aportación a la flora briofítica de Albacete (S.E. España). *La Sierra del Relumbrar. Anales de Biología* 9: 61-66.
- Hill MO, Preston CD, Smith AJE. 1991. Atlas of the bryophytes of Britain and Ireland. Volume 1. Liverworts (Hepaticae and Anthoceroae). Colchester: Harley Books.
- Hill MO, Preston CD, Smith AJE. 1994. Atlas of the bryophytes of Britain and Ireland. Volume 3. Mosses (Diplolepideae). Colchester: Harley Books.
- Jiménez JA. 2004. Pottiaceae: *Didymodon*. In *Flora Briofítica Ibérica* (Guerra J & Cros RM, coords./eds.). Murcia: Sociedad Española de Briología.
- Jiménez JA, Ros RM, Cano MJ & Guerra J. 2002. Contribution to the flora of Morocco: terricolous and saxi-

- colous bryophytes of Jbel Bouhalla. *Journal of Bryology* 24: 243-250.
- Jiménez MN & Ros RM. 1984. Aportación al conocimiento de la brioflora de la provincia de Albacete. Fuente de las Raigadas, Sierra del Calar del Mundo. *Anales de Biología* 2: 301-306.
- Jiménez MN, Ros RM & Guerra J. 1989. *Phascum vlasovii* Laz. (Pottiaceae, Musci) en Europa. *Anales del Jardín Botánico de Madrid* 47: 234-235.
- Jovet-Ast S & Bischler H. 1976. Hépatiques de la Péninsule Ibérique: énumération, notes écologiques. *Revue Bryologique et Lichénologique* 42: 931-987.
- Kučera J. 1998. *Gymnostomum lanceolatum* Cano, Ros & Guerra (Pottiaceae, Musci) also in Turkey and Croatia. *Journal of Bryology* 20: 515-516.
- Lara F, Mazimpaka V, Garillete R & García-Zamora P. 1999. *Orthotrichum vittii*, a new epiphytic moss from Spain. *The Bryologist* 102: 53-60.
- Lara F, Garillete R, Mazimpaka V, Sérgio C & García C. 2001. Some new remarkable *Orthotrichum* records from Portugal. *Cryptogamie, Bryologie* 22: 279-285.
- Lara F, Blockeel TL, Garillete R & Mazimpaka V. 2003. Some interesting *Orthotrichum* species from mainland Greece and Evvia. *Journal of Bryology* 25: 129-134.
- Maier E. 2002. *Grimmia dissimulata* E. Maier sp. nova, and the taxonomic position of *Grimmia trichophylla* var. *meridionalis* Müll. Hal. (Musci, Grimmiaceae). *Candollea* 56: 281-300.
- Moya JJ, Ros RM, Guerra J & Cano MJ. 1995. *Weissia papillosissima* Laz. (Pottiaceae, Musci), a species new to the European Bryophyte Flora. *Journal of Bryology* 18: 493-498.
- Muñoz J. 1999. A revision of *Grimmia* (Musci, Grimmiaceae) in the Americas. 1: Latin America. *Annals of the Missouri Botanical Garden* 86: 118-191.
- Pócs T, Sabovljevič M, Puche F, Segarra JG, Gimeno C & Kürschner H. 2004. *Crossidium laxefilamentosum* Frey & Kürschner (Bryopsida: Pottiaceae), new to Europe and North Africa. *Journal of Bryology* 26: 113-124.
- Porley D P. 2004. *Grimmia dissimulata* E. Maier in Britain. *Field Bryology, The Bulletin of the British Bryological Society* 82: 13-17.
- Potier de la Varde R. 1945. Liste des espèces du genre *Fissidens* récoltées dans la Péninsule ibérique par M. et Mme. P. Allorge. *Revue Bryologique et Lichénologique* 15: 30-39.
- Puche F. 2001. Flora briofítica de la Comarca de los Serranos (Valencia). *Boletín de la Sociedad Española de Briología* 18/19: 127-136.
- Puche F. 2004. Pottiaceae: Tortella. In *Flora Briofítica Ibérica* (Guerra J & Cros RM, coords./eds.). Murcia: Sociedad Española de Briología.
- Rams S, Ros RM, Cano MJ & Guerra J. 2000. Brioflora urbana de la ciudad de Murcia (SE Península Ibérica). *Boletín de la Sociedad Española de Briología*. 7: 9-18.
- Ros RM. 1984. Una nueva localidad de *Gigaspermum mouretii* Corb. (Musci) en la Península Ibérica. *Acta Botanica Malacitana* 9: 93-96.
- Ros RM & Llimona X. 1984. Estudio briológico del Sistema de Sierras de Ponce y Quípar (Oeste de Murcia, Sureste de España). *Collectanea Botanica* 15: 431-457.
- Ros RM & Guerra J. 1985. Aportación al conocimiento de la brioflora del Sureste de España. *Anales del Jardín Botánico de Madrid* 41: 257-266.
- Ros RM. 1986. Estudio sobre la flora y vegetación briofítica terrícola de la provincia de Murcia. Tesis Doctoral. Murcia: Universidad de Murcia.
- Ros RM & Guerra J. 1986. *Crossidium aberrans* Holz. & Bartr. (Musci) novedad para la flora europea. *Cryptogamie, Bryologie et Lichénologie* 7: 71-75.
- Ros RM & Guerra J. 1987. Catálogo de briófitos terrícolas de la Región de Murcia (SE de España). *Candollea* 42: 577-599.
- Ros RM & Guerra J. 1988. Algunas especies de briófitos nuevas del Sureste de España. *Acta Botanica Malacitana* 13: 299-306.
- Ros RM, Guerra J, de las Heras-Ibáñez J, García Zamora P & Jiménez MN. 1989. Nueva aportación a la brioflora del SE español. *Saussurea* 19: 49-55.
- Ros RM, Cano MJ & Guerra J. 1996. Modificaciones a la flora briofítica del SE Español. *Boletín de la Sociedad Española de Briología* 8: 4-6.
- Rungby S. 1962. A Contribution to the Bryophytic Flora of Spain and Morocco, especially the area between Gandía and Alcoy. *Botaniska Notiser* 115: 61-64.
- Rungby S. 1964. A Contribution to the Bryophytic Flora of Spain, especially the environs of Hellín. *Botaniska Notiser* 117: 167-171.
- Sánchez-Gómez P & Guerra J (eds.). 2003. *Nueva Flora de Murcia*. Plantas Vasculares. Murcia: DM.
- Sánchez-Moya MC & Cano MJ. 1999. Adiciones a la flora briofítica del sudeste español. *La Sierra Minera de la Unión* (Murcia). *Boletín de la Sociedad Española de Briología* 14: 9-12.
- Simó RM. 1976. Catálogo de briófitos recolectados por Durieu de Maisonneuve en la Península Ibérica. *Acta Phytotaxonomica Barcinonensia* 21: 53-69.
- Smith AJE. 1997. The *Hypnum cupressiforme* complex in the British Isles. *Journal of Bryology* 19: 751-774.
- Tan BC, Zander RH & Taylor T. 1981. *Pseudocrossidium hornschurchianum* and *P. revolutum* var. *obtusulum* in the New World. *Lindbergia* 7: 39-42.
- Vitt DH. 1973. A revision of the genus *Orthotrichum* in North America, north of Mexico. *Bryophytorum Bibliotheca* 1.

