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Bryophytes collected in Spain during the Tenth I. P. E. in 1953

By V. ALLORGE, Paris, and P. W. RICHARDS, Bangor (North Wales)

To those fortunate enough to take part, the excellently planned tour which the Spanish Committee arranged for the Tenth I. P. E. under the leadership of Srs. RIVAS-GODAY and GALIANO gave admirable opportunities for studying the plant communities of nearly all the more important phytogeographical regions of Spain with their continually changing interactions of climate, soil, vegetation and human culture. In addition, those of us who were specially interested in some special section or group of the flora were able to make collections, never very exhaustive in any one area, but from a large and representative number of localities. The authors of the present paper devoted themselves largely to the bryophytes and as the following pages show, made a collection of remarkable size and interest, considering the limited time available and the season of the year (June-July) which was not favourable for the drier districts.

The bryophytes of the Iberian Peninsula are no less rich and varied than the spermatophytes and are very much less completely known. In his great posthumous work on the bryogeography of the Peninsula (1947) the late PIERRE ALLORGE estimated the total number of species of mosses and hepatics at 930. Since in a tour of four weeks we have been able to add several species and varieties to the total, it is evident that this figure is not an overestimate and that much still remains to be done. Doubtless the Iberian Peninsula will in the end prove to be bryologically one of the richest, as well as one of the most diversified regions of Europe; eventually it may prove even richer than such comparatively well investigated countries as the British Isles and France.

During our tour one of the most vivid impressions was of the striking, often dramatic, contrasts between the bryophytes of one climatic region and another, and between calcareous and non-calcareous substrata within the same climatic region. The most remarkable of these contrasts is that between what P. ALLORGE (following JEAN BRUHNES) terms «l'Ibérie humide» and «l'Ibérie sèche». In the former, the Atlantic region of north and north-west Spain, which we saw to particular advantage during the sections of our tour from Cervera de Pisuerga to Covadonga and Oviedo, and from Ribadeo to Lugo, is marked by a luxuriance in bryophytes rivalling that of Wales, western Scotland and Ireland. Many of the species met with here such as *Fissidens polyphyllus*, *Saccogyna viticulosa*, *Plagiochila spinulosa*, and *Lejeunea lamacerina* are characteristic elements of the flora in both regions. During the journey from Lugo via Ponferrada and the Sierra de Manzanal to León there is a steep gra-

dient of climate, accompanied by an equally sharp change to the relatively poor bryo-flora of «l'Ibérie sèche». The regions where the Mediterranean bryo-flora is well developed, such as Montserrat in Catalonia and the Sierra Morena in the region of Despeñaperros, occupy to some extent an intermediate place, since the bryophytes, though far less luxuriant than in the permanently moist Atlantic regions, are relatively rich in species.

It is noteworthy that though «l'Ibérie sèche» is not rich in bryophytes, they are not absent even in climatically and edaphically very dry areas. Thus in Los Monegros in Aragon on the dry «pseudo-steppe» where *Juniperus thurifera* occurs, *Pleurochaete squarrosa* and *Tortula ruralis* were found growing under bushes of *Salsola vermiculata*, while on the equally dry slopes of the hills near Fraga (prov. Huesca), *Trichostomum crispulum*, *T. brachydontium* and *Weissia wimmeriana* were collected. Similarly on a small and very dry dehesa near Fuente del Camero in the low rainfall area between León and Salamanca *Camptothecium aureum*, *Barbula unguiculata* and *Pleurochaete squarrosa* were found during a few minutes collecting. In the spring, when the ground is moist, many small ephemeral species, not visible during the summer drought, are doubtless to be found in these dry areas.

In spite of the great contrasts between the various phytogeographical regions of Spain, certain bryophytes, notably *Pleurochaete squarrosa* (on dry, especially calcareous, soils), *Bryum argentum* and, near springs etc., *Eucladium verticillatum*, occur everywhere. Some species such as *Ceratodon purpureus* and *Hypnum cupressiforme* which are omnipresent in northwestern Europe are, however, less universally distributed in the Peninsula.

In the course of our tour we were able to make small collections in several regions of Spain where very little work has been done before and some of these would certainly repay further bryological exploration notably the region of the Cebollera and the Puerto de Piqueras, between Logroño and Soria, where our collections show that a rich bryophyte flora of a markedly Atlantic character exists on the siliceous rocks at the higher altitudes. The Sierra de Manzanal between Ponferrada and León would probably also prove of interest. Other areas, of which more is known but where further exploration would probably be rewarding, are the neighbourhood of Puerto Sueve, between Arriondas and Colungas (Prov. Oviedo) and the western part of Asturias between Oviedo and the border of Galicia.

The following list is a complete catalogue of all bryophytes collected during the I. P. E., with the exception of a few very common species which have been omitted for the sake of brevity. The collectors' names are indicated as follows:— V. A. = ALLORGE; R. = P. W. RICHARDS.

Other collectors names are given in full. All determinations were made by one or both authors, except where otherwise indicated. We have to thank the following for assistance in determinations:— Dr. H. BUCH (Helsinki), Mr. S. W. GREENE (Bangor), Mr. P. GREIG-SMITH (Bangor), Dr. H. PERSSON (Stockholm), Miss E. M. LOBLEY (Hexham).

The nomenclature follows, as far as practicable, the lists of BUCH, EVANS and VERDOORN (1938) for the hepaticae and of RICHARDS and WALLACE (1950) for the musci.

New records for Spain (or the Peninsula) are indicated thus ** and new records for provinces thus *.

A few previously unpublished records of V. and P. ALLORGE have been included where appropriate.

Hepaticae

Anthelia juratzkana (Limpr.) Trev. — Granada: snow valley, near torrent, on path to Laguna de las Yegas, above 2700 m, S. Nevada, 21. VII., V. A. Previously recorded from the S. Nevada by WILLKOMM.

Trichocolea tomentella (Ehrh.) Dum. — Asturias: bank near stream, under deciduous trees, c. 100 m, near Arriondas, 6. VII., R.

Telaranea nematodes (Gottsche) Howe — Asturias*: on soil, bank near stream, under deciduous trees, c. 100 m, near Arriondas, 6. VII., R. This interesting species, which is widely distributed in the tropics, subtropics and Macaronesian islands, was first discovered in Europe by F. VERDOORN in 1935 (BUCH, 1938) and is now known from Ireland, France, Spain and Portugal. In addition to the new locality given above, it is known in the Peninsula from the provinces of Minho (Portugal), Guipuzcoa, Navarra and Santander (V. and P. ALLORGE, 1944). Careful search would doubtless show it to be widespread on non-calcareous rocks in sheltered situations along the north and northwest coasts.

Calypogeia fissa (L.) Raddi — León: in moist gully under bushes, c. 1100 m, Puerto de Manzanal, 11. VII., R.

C. trichomanis (L.) Corda — Asturias*: moist shaded talus by road from Oviedo to Luarca, between La Espina and Trevias, 10. VII., V. A.

C. arguta, Mont. and Nees — Asturias: moist siliceous talus by road from Oviedo to Luarca, between La Espina and Trevias, 10. VII., V. A.

Prionolobus turneri (Hook.) Schiffn. — León*: moist gully, under bushes, c. 1100 m, Puerto de Manzanal, 11. VII., R.

Leiocolea muelleri (Nees) Joerg. — Barcelona: on moist north-facing bank, in slight shade, c. 700 m, Montserrat, 24. VI, R. Previously recorded from this locality by CASARES GIL.

***L. obtusa* (Lindb.) Buch — Santander: on conglomerate boulder in Fagetum, among mosses, c. 1365 m, below Puerto de Piedras Luengas,

5. VII., R. New to the Iberian Peninsula and not previously recorded nearer than the British Isles (mountains of Wales and Scotland), central France and the Alps. Not yet detected in the Pyrenees, but probably overlooked because of its resemblance in the field to *Barbilophozia barbata*. Determination confirmed by H. PERSSON.

Lophozia alpestris (Schleich.) Evans — Huesca*: rocks near the ibon Brachimaña, Baños de Panticosa, 30. VI., V. A.

Barbilophozia hatcheri (Evans) Loeske — Huesca*: in tuft of *Pohlia nutans* on granitic rocks about the ibon Brachimaña, Baños de Panticosa, 30. VI., V. A.

B. barbata (Schmid) Loeske — Asturias*: on shaly limestone, c. 1100 m, below Puerto de Pajares, 9. VII., R. Huesca*: under *Buxus* on rocky talus near the lake, c. 1000 m, 28. VI., V. A. Santander*: boulder and tree trunks in Fagetum c. 1365 m, below Puerto de Piedras Luengas, 5. VII., V. A. and R.

Tritomaria quinquedentata (Huds.) Buch — Logroño: among mosses on boulders, *Quercus tozza* zone, c. 1100—1200 m, road from Logroño to Puerto de Piqueras, near Pagares, 2. VII., R.

Sphenolobus minutus (Crantz) Steph. — Asturias*: in small quantity among *Scapania gracilis*, rock crevices c. 700 m near summit of Puerto Sueve, Arriendas, 6. VII., R.

Nardia scalaris (Schrad.) Gray. (*Alicularia scalaris* [Schrad.] Corda) — Asturias: rock crevices, c. 700 m, near summit of Puerto Sueve, Arriendas, 6. VII., R.

Southbya stillicidiorum (Raddi) Lindb. — Asturias: moist calcareous rocks, Covadonga, 6. VII., R. León: hollows in dripping tufa by roadside, Desfildero de los Beyos, 7. VII., V. A. and R.

Plectocolea hyalina (Lyell) Mitt. (*Eucalyx hyalinus* [Lyell] Brid.) — Lugo: moist rocks by road from Vegadeo to Lugo, S. de Meira, c. 500 m, 10. VII., R. This plant is extremely luxuriant, resembling *P. paroica* (Schiffn.) Evans, except that the inflorescence (which is immature) is apparently dioecious. It is perhaps the same as the form from the western Pyrenees which has been described as *Eucalyx muellerianus* (Schiffn.) K. Müll. (see K. MÜLLER, 1906—11, pp. 533—34).

Pedinophyllum pyrenaicum (Spruce) Buch (*P. interruptum* [Nees] Lindb.) — Huesca*: under *Buxus*, rocky talus on edge of lake, c. 1000 m, Parador de Arguis, 28. VI., V. A.

Lophocolea cuspidata (Nees) Limpr. — Logroño: *Quercus tozza* woods, c. 1100—1200 m, road from Logroño to Puerto Piqueras, near Pagares, 2. VII., R.

Saccogyna viticulosa (Mich.) Dum. — Asturias: rocks and talus by road from Oviedo to Lueca, between La Espina and Trevias, 10. VII., V. A. and R.

Plagiochila asplenioides (L.) Dum. — Asturias: shaded rocky talus by road from Oviedo to Luarca, between La Espina and Trevias, 10. VII., V. A. and R. Santander: base of *Fagus* trunk, c. 1365 m, below Puerto de Piedras Luengas, 5. VII., V. A.

P. spinulosa (Dicks.) Dum. — Asturias: moist siliceous rocks, by road from Oviedo to Luarca, between La Espina and Trevias, 10. VII., V. A. and R.

Diplophyllum albicans (L.) Dum. — Logroño*: *Quercus tozza* woods, c. 1100—1200 m, road from Logroño to Puerto de Piqueras, near Pagarés, 2. VII., R. Lugo*: wooded talus, c. 500 m, by road from Vegadeo to Lugo, S. de Meira, 10. VII., V. A.

Scapania gracilis (Lindb.) Kaal. — Asturias: rock crevices c. 700 m, near summit of Puerto Sueve, Arriondas, 6. VII, R. Det. H. PERSSON.

S. aspera Bernet — Asturias: calcareous rocks in Fagetum above Lago de Enol, on way towards Peña Santa de Enol, 6. VII., V. A.

S. undulata (L.) Dum. forma *dentata* — Huesca*: c. per., with *Hygrohypnum smithii*, rivulet on granite below Brachimaña, c. 2000—2200 m, Baños de Panticosa, 30. VI., V. A.

S. nemorosa (L.) Dum. — Asturias*: under trees by stream, c. 100 m, near Arriondas, 6. VII., R. On ground in oakwood between Infiesto and Oviedo, 7. VII., R. Moist siliceous talus by road from Oviedo to Luarca, between La Espina and Trevias, 10. VII., V. A.

***S. scandica* (Arn. and Buch) Macv. — Huesca: sparingly, c. antherid., in tufts of *Bartramia ithyphylla* and *Dicranoweisia crispula* on granite rocks near the ibon Brachimaña, Baños de Panticosa, 30. VII., V. A. Det. (with some doubt) by H. BUCH. This, if correct, is new to the flora of the Peninsula, but owing to the scantiness of the material, the determination must remain somewhat doubtful.

Cephalozia bicuspidata (L.) Dum. — Asturias: crevices of rocks c. 700 m, near summit of Puerto Sueve, Arriondas, 6. VII., R. Seen also in various other localities in the same province.

C. lammersiana (Hüb.) Spruce — Lugo*: c. per., rocks by roadside, c. 500 m under trees by road from Vegadeo to Lugo, S. de Meira, 10. VII., R.

Marsupella sphacelata (Gies.) Dum. — Madrid: edge of rivulet near refuge above La Laguna, Peñalara, c. 2000 m, S. de Guadarrama, 14. VII., V. A. Previously recorded from Peñalara by CASARES GIL.

Radula complanta (L.) Dum. — Asturias: c. per., siliceous rocks by road from Oviedo to Luarca, between La Espina and Trevias, 10. VII., R. Huesca*: c. per. under *Buxus*, rocky talus by lake, c. 1000 m, Parador de Arguis, 28. VI., V. A. Trunk of *Abies*, 1318 m, Ordesa, 30. VI., V. A.

R. lindbergiana Gottsche — Huesca: granite rocks about ibon Bra-chimaña, Baños de Panticosa, 30. VI., V. A.

Porella platyphylla (L.) Lindb. — León: old *Castanea* trunk, Desfiladero de los Beyos, 7. VII., V. A. Santander: Fagetum, c. 1365 m, below Puerto de Piedras Luengas, 5. VII., V. A.

P. cordaeana (Hub.) Evans — Santander*: boulders under *Fagus*, c. 1365 m, below Puerto de Piedras Luengas, 5. VII., R.

Lejeunea cavifolia (Ehrh.) Lindb. — Santander: boulders under *Fagus*, c. 1365 m, below Puerto de Piedras Luengas, V. A. and R. Det. P. GREIG-SMITH.

L. lamacerina Gottsche ex Steph. (*L. planiuscula* [Lindb.] Buch) — Lugo*: old *Castanea* trunk, near Becerreá, 11. VII., R. Det. P. GREIG-SMITH.

**var. *azorica* (Steph.) Greig-Smith (*L. azorica* Steph.) — Asturias: siliceous rocks by road from Oviedo to Luarca, between La Espina and Trevias, 10. VII., V. A. and R. Det. P. GREIG-SMITH.

Microlejeunea ulicina (Tayl.) Evans — Asturias: as isolated shoots, sparingly among other bryophytes, moist siliceous rocks by road from Oviedo to Luarca, between La Espina and Trevias, 10. VII., V. A. León*: creeping over *Frullania tamarisci* on trunk of old *Castanea*. Desfiladero de los Beyos, 7. VII., V. A.

Drepanolejeunea hamatifolia (Hook.) Schiffn. — Asturias*: creeping over shoots of *Fissidens taxifolius* on siliceous rocks, by road from Oviedo to Luarca, between La Espina and Trevias, 10. VII., V. A. Very rare in Spain; previously recorded by P. ALLORGE from Guipuzcoa and Navarre.

Jubula hutchinsiae (Hook.) Dum. — Asturias*; with *Telaranea* on soil under deciduous trees on bank of small stream, c. 100 m, near Arriondas, 6. VII., R. A westward extension of the range of this species, which has been previously recorded in the Peninsula only from the Basque Provinces of Navarre and Guipuzcoa.

Metzgeria furcata (L.) Dum. — Huesca*: trunk of *Abies*, c. 1318 m, Parador de Ordesa, 30. VI., V. A.

M. pubescens (Schrank) Raddi — Santander*: conglomerate boulders in Fagetum, c. 1365 m, below Puerto de Piedras Luengas, 5. VII., V. A. and R.

Marchantia paleacea Bertol. — Granada: edge of small spring, garden of the Generalife, Granada, 20. VII., V. A. Previously recorded from the Alhambra by WILLKOMM.

Dumortiera hirsuta (Sw.) R., Bl. and N. — Asturias: rocks under deciduous trees, by small stream, c. 100 m, near Arriondas, 6. VII., R. León: near small rivulet with *Fissidens grandifrons*. Desfiladero de los Beyos, 7. VII., V. A.

Preissia quadrata (Scop.) Nees — Huesca: rock crevices in *Pinus uncinata* forest by path from Baños de Panticosa to ibon Brachimaña, 30. VII., V. A. León: under wet rocks, c. 1360 m, Puerto de Pajares, 9. VII., V. A.

Targionia hypophylla L. — Jaén: c. spor., crevices of limestone rocks, c. 519 m, beneath the Castillo, Jaén, 18. VII., V. A. C. anther., crevices of schistose rocks, c. 600—700 m, Despeñaperros, S. Morena, 16. VII., V. A.

Corsinia coriandrina (Spreng.) Lindb. — Jaén: c. per., on soil at base of schistose rocks, c. 600—700 m, Despeñaperros, 16. VII., V. A.

Riccia bischoffii Hüb. (*R. ciliifera* Link) — Madrid: moist sunny places, c. 2000—2200 m, near the refuge above the laguna, Peñalara, S. de Guadarrama, 14. VII., V. A.

Soria: sandy ground in pinewood, Piñar Grande de Navaleno, 3. VII., V. A. and R.

Plagiochasma rupestre (Forst.) Steph. — Jaén: c. spor., crevices of limestone rocks c. 519 m, beneath the Castillo, Jaén, 18. VII., V. A. & R.

Muscinae

Sphagnales

Sphagna collected by P. W. R. were all determined by Miss E. M. LOBLEY.

Sphagnum palustre L. — Huesca: edge of small lake, c. 1500 m, Baños de Panticosa, 30. VI., R. León: small bog by roadside, 1360 m, Puerto de Pajares, 9. VII., V. A. Asturias: roadside seepage, c. 600 m, Puerto Sueve, Arriondas, 6. VII., R.

S. compactum DC. — Asturias: damp hollow on heath, north aspect, c. 700 m, Puerto Sueve, Arriondas, 6. VII., R.

S. recurvum P. Beauv. var. *amblyphyllum* (Russ.) Warnst. — León*: small bog by roadside, 1364 m, Puerto de Pajares, 9. VII., V. A.

S. contortum Schultz **var. *platyphyllum* (Sull. ex Lindb.) Åberg (*S. platyphyllum* [Sull.] Warnst.). — Madrid: edge of rivulet, small marsh on slopes above the Puerto de los Cotos, Peñalara, c. 1800—1900 m. First record for Spain, but previously reported from Portugal (S. da Estrela). The following previously unpublished records may be added:—Lugo: peaty heath, Gandara Grande, Fereirra de Valle del Oro, 1926, V. and P. ALLORGE; peaty meadow at Fonsagrada in the same province, 1933, V. and P. ALLORGE.

S. subsecundum Nees — Logroño*: wet heath, c. 1700 m, Puerto de Piqueras, 2. VII., R.

var. *inundatum* (Russ.) C. Jens. em. Åberg — Huesca: moor on edge of small lake, c. 1700 m, Baños de Panticosa, 30. VI., R. Lugo: dripping

rocky talus, c. 500 m, by road from Vegadeo to Lugo, S. de Meira, 10. VII., V. A. Madrid: banks of rivulet, c. 1800—1900 m, above Puerto de los Cotos, Peñalara, 14. VII., V. A. New record for the S. de Guadarrama.

var. *auriculatum* (Schp.) Lindb. em. Åberg — Asturias: roadside seepage, south aspect, c. 600 m, Puerto Sueve, Arriondas, 6. VII., R. Madrid: peaty marsh above La Laguna, near the refuge, c. 2000—2200 m, Peñalara, 14. VII., V. A.

S. girgensohnii Russ. — Lugo*: in large tufts on wooded talus, road from Vegadeo to Lugo, S. de Meira, c. 500 m, 10. VII., V. A. Appears to be rare in the Peninsula and recorded only from the Pyrenees (Mala-detta).

S. acutifolium (Ehrh.) Warnst. — Huesca: moor on edge of lake, c. 1700 m, Baños de Panticosa, 30. VII., R. Previously found in this locality by P. ALLORGE (ined.). Logroño*: wet heath, c. 1700 m, Puerto de Piqueras, 2. VII., R. Lugo: wooded talus on siliceous soil, S. de Meira, c. 500 m, road from Vegadeo to Lugo, 10. VII., V. A. The well known name for this species is retained here pending the solution of nomenclatorial problems that surround it.

S. quinquefarium (Lindb.) Warnst. — Asturias: damp hollow, north aspect, c. 700 m, Puerto Sueve, Arriondas, 6. VII., R. Cangas de Onis and Rio Negro, Luarca, P. ALLORGE (ined.).

S. plumulosum Röhl. — Asturias: green form, seepage by roadside, north aspect c. 700 m, Puerto Sueve, Arriondas, 6. VII., R. — Lugo: road from Vegadeo to Lugo, S. de Meira, c. 500 m, 10. VII., M. WELTEN (det. V. A.).

Bryales

Polytrichum alpinum Hedw. — Granada: under a rock, Laguna de las Yegas, S. Nevada, 21. VII., H. HUMBERT.

P. juniperinum Hedw. — Palencia: on soil in heath of *Cistus laurifolius*, near Alar del Rey, 4. VII., V. A.

var. *alpinum* Bry. Eur. Granada: grassland moistened by a torrent, with *Pohlia carinata*, c. 2750—2800 m, path to Laguna de las Yegas, S. Nevada, 21. VII., V. A.

P. formosum Hedw. — Logroño: *Quercus tozza* woods, c. 1100—1200 m, near Pagares (road to Puerto de Piqueras), 2. VII., R.

P. commune Hedw. — Lugo: siliceous talus in wood, c. 500 m, by road from Vegadeo to Lugo near the S. de Meira, 10. VII., V. A.

var. *humile* Sw. (*P. commune* var. *minus* Weiss) — Lugo: c. sp., with *Sphagnum* sp. in small peat bog, c. 500 m between Meira and Lugo, 10. VII., V. A. Madrid: c. sp., edge of rivulet on slopes above Puerto de los Cotos and in the small bogs on the slopes of Peñalara, S. de Guadarrama, 14. VII., V. A.

Fissidens inconstans Schp. — León: c. sp., on moist soil in shade of *Salix* and *Rhamnus frangula*, c. 1100 m, Puerto de Manzanal, 11. VII., R. Det. A. Norkett.

F. taxifolius Hedw. — Asturias: hollow in moist siliceous rocks, by road from Oviedo to Lluarca, between La Espina and Trevias, 10. VII., V. A. Santander: on soil under *Fagus*, c. 1365 m, below Puerto de Piedras Luengas, 5. VII., R.

F. adianthoides Hedw. — Logroño*: *Quercus tozza* woods, c. 1100—1200 m, road from Logroño to Puerto de Piqueras, near Pagares, 2. VII., R.

Ceratodon chloropus Brid. (*Cheilothela chloropus* [Brid.] Lindb.) — Palencia*: on soil in heath of *Cistus laurifolius*, near Alar del Rey, 4. VII., V. A.

Rhabdoweisia fugax (Hedw.) Bry. Eur. — León: c. sp., on moist soil in shade of *Salix* and *Rhamnus frangula*, c. 1100 m, Puerto de Manzanal, 11. VII., R.

F. polyphyllus Wils. — Asturias: rocks near stream in shady ravine, c. 500 m, near Arriondas, 6. VII., R. Lugo*: edge of stream, c. 500 m, S. de Meira (road from Vegadeo to Lugo), 10. VII., R. In the latter locality the plant grows to over 20 cm long.

F. grandifrons Brid. — Huesca: waterfall by roadside, below Baños de Panticosa, 1. VII., V. A. and R. Previously collected in this locality by V. and P. ALLORGE in 1935. León: waterfall, Desfiladero de los Beyos, 7. VII., V. A. and R.

Ditrichum flexicaule (Schleich.) Hampe — Asturias: grassland beneath calcareous cliff, c. 1400—1500 m, below Peña Santa de Enol, 6. VII., V. A.

Dicranoweisia crispula (Hedw.) Lindb. — Huesca: granite rocks near the ibon Brachimaña, Baños de Panticosa, 30. VI., V. A.

Dicranum strictum Schleich. — Huesca: c. sp., on rotten log in *Fagus-Abies* forest, c. 1318 m, National Park of Ordesa, 29. VI., R. Lugo: old *Castanea* trunk, near Beccereá, 11. VII., R. Previously collected in the latter locality by V. and P. ALLORGE

Campylopus subulatus Milde — Huesca: rocks about the ibon Brachimaña, Baños de Panticosa 30. VI., V. A. Previously found near the Refuge Brazato at 2250 m by V. and P. ALLORGE in 1935.

C. introflexus (Hedw.) Brid. — Asturias: siliceous rocks, c. 700 m, near summit of Puerto Sueve, Arriondas, 6. VII., R.

***Paraleucobryum sauteri* (Schp.) Loeske — Huesca: in crevices of granite rocks near the ibon Brachimaña, Baños de Panticosa, 30. VI., V. A. New to the Peninsula; not previously found on the Spanish side of the Pyrenees.

Tortula ruralis (Hedw.) Crome — Lérida*: Robledad de Panadella, c. 700 m, V. A. Zaragoza*: with *Juniperus thurifera* in «pseudo-steppe», Los Monegros, 26. VI., R.

T. ruraliformis (Besch.) Dix. — Huesca: form with costa very papillose on the back, Saladares de Almudevar, 26. VI., V. A. Palencia*: soil of heath of *Cistus laurifolius*, near Alar del Rey, 4. VII., V. A.

T. laevipila (Brid.) Schwaegr. var. *laevipiliformis* (De Not.) Limpr. — Jaén*: trunk of *Quercus suber*, c. 600—700 m, Despeñaperros, S. Morena, 16. VII., V. A.

T. subulata Hedw. — Jaén*: calcareous rocks near a spring, Jabalcuz, 19. VII., V. A.

var. *integrifolia* Boul. Asturias*: rocks of a calcareous cliff, c. 1400—1500 m beneath Peña Santa de Enol, 6. VII., V. A.

T. fiorii Vent. — Jaén*: c. sp., under bushes of *Ononis tridentata* var. *angustifolia* on gypsiferous soil derived from Triassic rocks, with *Capparis spinosa*, *Artemisia herba-alba*, *Antirrhinum glutinosum* and *Andryala arenaria*, near Campillo de Arenas, 19. VII., V. A. A moss characteristic of gypsiferous soil. This is the fifth locality in Spain from which it has been recorded; indicated by CASARES GIL in the provinces of Madrid, Palencia and Toledo and by Beltrán Bigorra in Castellon.

Aloina ambigua (Bry. Eur.) Limpr. — León*: calcareous rocks near the pass, c. 1300 m. Puerto de Pajares, 9. VII., V. A.

Desmatodon latifolius Hedw. var. *muticus* Brid. — Granada: wet rocks near a torrent, c. 2800—2900 m, path to Laguna de las Yegas, S. Nevada, 21. VII., V. A. Picacho de Veleta, c. 2900—3000 m, 21. VII., K. Faegri. Previously recorded from the S. Nevada by HÖHNEL and MAIRE.

Crossidium squamigerum (Viv.) Jur. — Granada: stony calcareous soil, c. 1000 m, Puerto del Inquisición, 19. VII., V. A.

C. chloronotos (Brid. ex Bruch) Jur. — Granada*: with the last, Puerto del Inquisición, 19. VII., V. A.

Pterygoneurum ovatum (Hedw.) Dix. var. *incanum* (Jur.) — Huesca*: near Parador de Arguis, c. 104 m, V. A. — Jaén*: with *Tortula fiorii*, near Campillo de Arenas, 19. VII., V. A.

Pottia starkeana (Hedw.) C. M. — Jaén*: c. sp., calcareous rock near a spring, Jabalcuz, 19. VII., V. A.

Cinclidotus fontinaloides (Hedw.) PB. — Asturias: c. sp., torrent on calcareous rocks, c. 1400 m, slopes of Peña Santa de Enol, 6. VII., V. A.

Barbula revoluta Brid. — Granada*: with old setae, stony calcareous soil, Quercetum ilicis, c. 1000 m, Puerto del Inquisición, 19. VII., V. A.

B. fallax Hedw. — Huesca: on soil and lumps of earth, alluvia near Biescas, 1. VII., V. A.

B. vinealis Brid. — Huesca*: calcareous soil in *Quercetum ilicis*, Carrascal de Pebrero, 28. VI., V. A.

Trichostomum brachydontium Bruch — Huesca*: on soil and stones, Carrascal de Pebrero, 28. VI., V. A. Hillside with *Pinus halepensis*, near Fraga, 26. VI., V. A.

T. crispulum Bruch — Huesca*: very small form, on denuded calcareous soil, Carrascal de Pebrero, 28. VI., V. A. With *T. brachydontium* near Fraga, 26. VI., V. A.

Weissia wimmeriana (Sendt.) Bry. Eur. — Huesca*: under *Pinus halepensis* and *Rosmarinus*, hillside near Fraga, 26. VI., V. A.

Triquetrella arapilensis Luis. — Córdoba*: dried up grassy patch in Cisto-Genistetum, c. 700 m, slopes of Cerro Murriano, S. de Córdoba, 17. VII., V. A. This locality (where it occurs in very small quantity associated with *Riccia* sp.) extends the range of this very interesting Iberian endemic considerably to the southeast: the previously known localities in Spain are:— Salamanca: Pequeño Arapil and other localities near Salamanca (LUISIER), Madrid: El Pardo (V. and P. ALLORGE, 1928), Toledo: Marrupe (V. and P. ALLORGE, 1928), Badajóz: between Merida and Carrascalejo (V. and P. ALLORGE, 1934), Zamora: Puente de Requejo (V. and P. ALLORGE, 1934). In Portugal it has been found in Alemtejo: Castelo de Vide (V. and P. ALLORGE, 1934), Beira Alta: Mangualde (V. and P. ALLORGE, 1930), Beira Baixa: Villarformosa (V. and P. ALLORGE, 1931), Bragança: Monte de S. Bartolomeu, near Bragança (V. and P. ALLORGE, 1931), Trás-os-Montes: Foz-Tua (Machado), Vidago (Ervideira). In the S. de Córdoba, as in its other localities, *T. arapilensis* grows on acid siliceous soil and it is probably to be regarded as a calcifuge species.

Coscinodon cribrosus (Hedw.) Spruce — Huesca*: small sterile form with very short, almost entire hair-point, granite rocks near the ibon Brachimaña, c. 2000—2200 m, near Baños de Panticosa, 30. VI., V. A.

Grimmia conferta Funck — Asturias*: c. sp., dry calcareous rocks in Fagetum above Lago de Enol, 6. VII., V. A.

G. alpicola Hedw. var. *rivularis* (Brid.) Broth. — Granada: rocks near a torrent c. 2800 m, path to Laguna de las Yegas, S. Nevada, 21. VII., V. A.

G. mollis Bry. Eur. — Granada: sterile, edge of torrent, c. 2800 m, path to Laguna de las Yegas, S. Nevada, 21. VII., V. A.

G. montana Bry. Eur. — Huesca*: c. sp., rock above Baños de Panticosa, c. 2000 m, 30. VI., R.

G. orbicularis Bruch — Granada: on soil in *Quercetum ilicis*, c. 1000 m, Puerto del Inquisición, 19. VII., V. A.

var. *longipila* Schp. — Huesca: on small calcareous boulders and rocks in *Quercetum ilicis*, Carrascal de Pebrero, 28. VI., V. A.

G. hartmanii Schp. — Huesca: with *Cardamine resedifolia*, on granitic rocks in forest of *Pinus uncinata*, by path above Baños de Panticosa, 30. VI., V. A.

G. decipiens (Schultz) Lindb. — Jaén: schistose rocks, c. 600—700 m, Despeñaperros, S. Morena, 16. VII., V. A.

G. patens (Hedw.) Bry. Eur. — Huesca: siliceous rocks above Baños de Panticosa, by path to Brachimaña, 30. VI., V. A. Previously collected near Baños de Panticosa by P. ALLORGE in 1935.

Rhacomitrium aquaticum (Brid.) (*R. protensum* A. Br. ex Hüben.) — Asturias*: rocks in ravine, c. 500 m, near Arriendas, 6. VII., R.

R. canescens (Hedw.) Brid. — León: bare rocks, c. 1100 m, Puerto de Manzanal, 11. VII., V. A.

R. lanuginosum (Hedw.) Brid. — Asturias*: rocks near summit of Puerto Sueve, c. 700 m, Arriendas, 6. VII., R. Previously found in several localities in the same province by P. ALLORGE (ined.).

Funaria microstoma Bry. Eur. — Palencia*: c. sp., on soil with *Ceratodon chloropus* on heath of *Cistus laurifolius*, near Alar del Rey, 4. VII., V. A.

F. convexa Spruce — León: calcareous rocks, c. 1300 m, near Puerto de Pajares, 9. VII., V. A. Previously collected in this locality by P. ALLORGE in 1928.

F. attenuata (Dicks.) Lindb. (*F. templetonii* Sm.) — Asturias*: c. sp., loamy bank by stream, road from Oviedo to Lueca, between La Espina and Trevias, 10. VII., R.

Pohlia nutans (Hedw.) Lindb. — Huesca: fissures of granitic rocks about Brachimaña, Baños de Panticosa, 30. VI., V. A.

P. carinata (Brid.) Möll. — Granada: moist grassland with *Polytrichum juniperinum* var. *alpinum* and near patches of *Anthelia juratzkana*, above 2700 m, path to Laguna de las Yegas, S. Nevada, 21. VII., V. A.

P. albicans (Wahl.) Lindb. var. *glacialis* (Schleich.) Lindb. — Granada: Laguna de las Yegas, S. Nevada, 21. VII., R. NORDHAGEN; edge of torrent below Laguna de las Yegas, S. Nevada, 21. VII., V. A.

Bryum muehlenbeckii Bry. Eur. — Granada: wet rocks on edge of rivulet, c. 2800 m, path to Laguna de las Yegas, S. Nevada, 21. VII., V. A.

B. alpinum with var. *viride* Husn. — Jaén: near spring, 600—700 m, Despeñaperros, S. Morena, 16. VII., V. A.

B. capillare Hedw. var. *torquescens* (Bry. Eur.) Husn. — Huesca*: on soil «pseudo-steppe» of *Artemisia herba-alba*, Saladares de Almudevar, 28. VI., A. LAWALLREE. Lérida: Robledad de Panadella, c. 700 m, V. A.

Mnium spinosum (Voit) Schwaegr. — Huesca: c. sp., on soil and on boulders in *Abies* forest, c. 1318 m, Ordesa, 29. VI., V. A. and R.

M. stellare Hedw. — Santander: under *Fagus*, c. 1365 m, below Puerto de Piedras Luengas, 5. VII., R.

M. punctatum Hedw. — Logroño: wet bank by stream, c. 1700 m, Puerto de Piqueras, 2. VII., R.

Aulacomnium palustre (Hedw.) Schwaegr. — Logroño*: small bogs, c. 1600—1700 m, Puerto de Piqueras, 2. VII., R. Lugo: siliceous talus on slope, by road from Vegadeo to Lugo, S. de Meira, 10. VII., M. WELTEN. Madrid: banks of a rivulet, c. 1900—2000 m, slopes above Puerto de los Cotos, and in the small bogs on the slopes of Peñalara, S. de Guadarrama, 14. VII., V. A.

A. androgynum (Hedw.) Schwaegr. — Logroño: c. sp., on humus on bank under *Calluna*, etc., c. 1600—1700 m, Puerto de Piqueras, 2. VII., R.

Plagiopus oederi (Brid.) Limpr. — Asturias: moist rocks above the *Fagetum*, path to Peña Santa de Enol, 6. VII., V. A. — Huesca: c. sp., moist calcareous rocks, near Parador de Arguis, 28. VI., R.

Bartramia halleriana Hedw. — Santander: rocks in the *Fagetum*, c. 1365 m, Puerto de Piedras Luengas, 5. VII., V. A.

B. stricta Brid. — Jaén: schistose rocks, c. 600—700 m, Despeñaperos, S. Morena, 16. VII., V. A.

Philonotis rigida Brid. — Asturias: sterile, on moist rocks, c. 300 m, by road from Oviedo to Luarca, between la Espina and Trevias, 10. VII., R. Previously found by LEVIER between Salas and Cangas de Tineo.

P. fontana (Hedw.) Brid. — Huesca: c. sp., by spring, c. 1900 m above Baños de Panticosa, 30. VI., R. Lugo: moist talus by road from Vegadeo to Lugo, S. de Meira, 10. VII., V. A.

P. seriata (Mitt.) Lindb. — Granada: in moist depressions, by rivulets, the beds of which it sometimes fills completely, in many places near Laguna de las Yegas, S. Nevada, 21. VII., V. A., H. HUMBERT and R. NORDHAGEN. Madrid: edge of rivulet c. 2000—2200 m, above La Laguna and near the refuge, Peñalara, S. de Guadarrama, 14. VII., V. A.

P. marchica (Willd.) Brid. — Granada*: by spring, with *Eucladium verticillatum*, garden of the Generalife, Granada, 20. VII., V. A.

Ptychomitrium polyphyllum (Sw.) Fűrnr. — Asturias: c. sp., siliceous rocks by road from Oviedo to Luarca, between La Espina and Trevias, 10. VII., V. A. and R.

Amphidium mougeotii (Bry. Eur.) Schp. — Asturias*: wet siliceous rocks by road from Oviedo to Luarca, between La Espina and Trevias, 10. VII., V. A. Granada: c. fl. fem., rocks near Laguna de Las Yegas, S. Nevada, 21. VII., H. HUMBERT. Santander*: moist shaded rock by stream. c. 1365 m, below Puerto de Piedras Luengas, 5. VII., R.

Zygodon viridissimus (Dicks.) R. Br. var. *viridissimus* (*Z. viridissimus* [Dicks] R. Br. var. *vulgaris* Malta) — Huesca*: trunk of *Sorbus*

aucuparia, c. 1600 m, Baños de Panticosa, 30. VI. Jaén*: on trunk of *Quercus suber*, with *Tortula laevipila* var. *laevipiliformis*, c. 700 m, Despeñaperros, S. Morena, 16. VII., V. A. Lugo: on *Quercus robur*, near Becerreá, 11. VII., R.

Orthotrichum rupestre Schleich. — Avila: exposed granite rocks, near Alamedella, 13. VII., V. A. Logroño: siliceous rocks in *Quercus tozza* zone, c. 1100—1200 m, near Pagares, road from Logroño to Puerto de Piqueras, 2. VII., R.

O. anomalum Hedw. var. *saxatile* (Wood) Milde — Asturias: exposed calcareous rocks, c. 1400—1500 m, slopes of Peña Santa de Enol, 6. VII., V. A. León*: calcareous rocks, c. 1300 m, below Puerto de Pajares, 9. VII., V. A.

O. affine Brid. — Santander: *Fagus* trunks, c. 1365 m, below Puerto de Piedras Luengas, 5. VII., R.

O. striatum Hedw. (*O. leiocarpum* Bry. Eur.) — Huesca: trunk of *Sorbus aucuparia*, c. 1600 m, Baños de Panticosa, 30. VI., V. A.

O. lyellii Hook and Tayl. — León: trunk of an old *Castanea*, Desfiladero de los Beyos, 7. VII., V. A.

var. *fastigiatum* (Bruch) Hüben. — Huesca: trunk of *Sorbus aucuparia*, c. 1600 m, Baños de Panticosa, 30. VI., V. A.

O. diaphanum Brid. — Huesca*: trunk of *Quercus ilex*, Carrascal de Pebredo, 28. VI., V. A. and R.

Fontinalis antipyretica Hedw. — Madrid: torrent, c. 2000—2200 m, above La Laguna; near the refuge, Peñalara, S. de Guadarrama, 14. VII., V. A.

Antitrichia curtispindula (Hedw.) Brid. — Logroño: siliceous rock under *Fagus* trees, c. 1600—1700 m, Puerto de Piqueras, 2. VII., R.

A. californica Sull. — Jaén*: schistose rocks, c. 600—700 m, Despeñaperros, S. Morena, 16. VII., V. A. and R.

Pterogonium gracile (Hedw.) Sm. — Jaén*: exposed siliceous rocks, c. 600—700 m, Despeñaperros, S. Morena, 16. VII., V. A.

Leptodon smithii (Hedw.) Mohr — León: shaded rocks by road, Desfiladero de los Beyos, 7. VII., V. A. Previously found in this locality by V. and P. ALLORGE (1933).

Hookeria lucens (Hedw.) Sm. — Asturias: bank under deciduous trees by small stream, c. 100 m, near Arriondas, 6. VII., R.

Fabronia pusilla Raddi — Jaén*: trunk of *Quercus suber*, c. 600—700 m, Despeñaperros, 16. VII., V. A.

Leskea nervosa (Schwaegr.) Myrin — Santander: *Fagus* trunk, c. 1365 m, Puerto de Piedras Luengas, 5. VII., V. A.

Lescuraea mutabilis (Brid.) Lindb. var. *saxicola* (Bry. Eur.) Hagen — Huesca: rocks in the *Rhododendron* scrub about Brachimaña, Baños de Panticosa, 30. VI., V. A.

Pseudoleskea catenulata (Web. and Mohr) Bry. Eur. — Asturias: crevices of calcareous rocks, c. 1400—1500 m, slopes of Peña Santa de Enol, 6. VII., V. A.

P. incurvata (Hedw.) Dix. (*P. atrovirens* Bry. Eur.) — Asturias: rocks of a calcareous cliff, c. 1400—1500 m, under Peña Santa de Enol, 6. VII., V. A. Santander: tree root in Fagetum, c. 1365 m, below Puerto de Piedras Luengas, 5. VII., R.

Heterocladium squarrosulum (Voit) Lindb. — Huesca: rocks beneath *Rhododendron*, Brachimaña, Baños de Panticosa, 30. VI., V. A. Recorded from the ibon Brazato, c. 1900 m, by V. and P. ALLORGE.

Thuidium tamariscinum (Hedw.) Bry. Eur. — Lugo: wooded talus by road from Vegadeo to Lugo, S. de Meira, 10. VII., V. A.

T. delicatulum (Hedw.) Mitt. — Huesca*: under *Buxus*, with *Barbillophozia barbata*, c. 1000 m, slopes by lake, Parador de Arguis, 28. VI., V. A.

T. philibertii Limpr. — Logroño*: woods of *Quercus tozza*, 42 km from Logroño, on road to Soria, 2. VII., R.

Cratoneuron filicinum (Hedw.) Roth — León: moist rocks, c. 1300 m, below Puerto de Pajares, 9. VII., V. A.

Drepanocladus fluitans (Hedw.) Warnst. — Granada: bed of torrent, c. 2800 m, path to Laguna de las Yegas, S. Nevada, 21. VII., V. A.

D. exannulatus (Bry. Eur.) Warnst. f. *orthophyllum* (Milde as var.). — Granada: edge of small pool, c. 2700 m, Picacho de Veleta, 21. VII., R.

D. aduncus (Hedw.) Warnst. — Madrid: rivulet flowing over level ground, c. 2000—2200 m, above La Laguna, near the refuge, Peñalara, S. de Guadarrama, 14. VII., V. A.

D. uncinatus (Hedw.) Warnst. — Santander*: c. sp. conglomerate boulder in *Fagus* woods, c. 1365 m, below Puerto de Piedras Luengas, 5. VII., R.

Hygrohypnum smithii (Sw.) Broth. — Huesca: c. sp., rocks in a rivulet, below Brachimaña, Baños de Panticosa, 30. VI. Previously collected at 2000—2200 m, above Baños de Panticosa, by V. and P. ALLORGE in 1935.

H. dilatatum (Wils. [Loeske]) Granada: edge of rivulet, c. 2700—2800 m, path to Laguna de las Yegas, 21. VII., V. A.

Acrocladium stramineum (Brid.) Richards and Wallace (*Calliergon stramineum* [Brid.] Kindb.) Madrid: peaty meadow, c. 1800 m, slopes above Puerto de los Cotos, Peñalara, S. de Guadarrama, 14. VII., V. A.

A. cuspidatum (Hedw.) Lindb. (*Calliergonella cuspidata* [Hedw.] Loeske) — Lugo: small peat bog, c. 500 m, near Meira, 10. VII., V. A.

Isothecium myosuroides Brid. — Asturias: rocks under *Fagus*, c. 500 m, near Arriondas. 6. VII., R. Lugo: siliceous rocks, S. de Meira, 10. VII., V. A.

I. myurum (Brid.) — Santander*: rocks in Fagetum, c. 1365 m, below Puerto de Piedras Luengas, 5. VII., V. A.

Camptothecium aureum Lagasca — Granada: on soil in Quercetum ilicis, c. 1000 m, Puerto del Inquisición, 19. VII., V. A. Zamora: on ground in dehesa near Fuente del Camero, 12. VII., V. A. and R. Jaén*: siliceous rocks, Despeñaperros, S. Morena 16. VII., V. A.

Brachythecium rivulare (Bruch) Bry. Eur. f. *molle* — Granada: edge of rivulet, c. 2700—2800 m, path to Laguna de las Yegas, 21. VII., V. A.

B. reflexum (Starke) Bry. Eur. — Huesca: with *Dicranoweisia crispula*, siliceous rocks in the *Rhododendron* scrub about Brachimaña, Baños de Panticosa, 30. VII., V. A.

Scleropodium illecebrum (Hedw.) Bry. Eur. — Jaén*: chistose rocks, Despeñaperros, S. Morena, 16. VII., V. A.

Eurhynchium striatum (Hedw.) Schp. emend. Störmer — Asturias: c. sp., on humus in ravine, under *Fagus*, c. 500 m, near Arriondas, 6. VII., R. Navarra: Quercetum ilicis, c. 700 m, S. de Tobar, 1. VII., R.

E. praelongum (Hedw.) Hobk. — Huesca*: under *Quercus ilex*, Carrascal de Pebrero, 28. VI., V. A.

E. alopecurum (Brid.) Richards and Wallace (*Hypnum lusitanicum* Schp., *E. rusciforme* (Neck.) Milde var. *alopecuroides* Brid.) — Lugo: small stream under trees, c. 500 m, by road from Vegadeo to Lugo, S. de Meira, 10. VII., R. For the synonymy of this species and the reasons for regarding it as distinct, see E. C. WALLACE (1949). The specimen from the S. de Meira resembles specimens from Portugal and the most luxuriant forms of the species from the British Isles. *E. alopecurum*, which is perhaps best regarded as a subspecies of *E. riparioides* (Hedw.) Jennings (*E. rusciforme* [Neck.] Milde) is a characteristic moss of fast streams on siliceous rocks in the extreme Atlantic regions of the Iberian Peninsula and the British Isles; it has been reported from western France (Finistère), and would be expected to occur in western Norway.

Pterygynandrum filiforme Hedw. — Santander: *Fagus* trunk, c. 1365 m, Puerto de Piedras Luengas, 5. VII., V. A.

var. *decipiens* (Web. and Mohr) Limpr. — Huesca*: rock among scattered *Pinus uncinata*, c. 2000 m, above Baños de Panticosa, 30. VI., R.

Orthothecium rufescens (Brid.) Bry. Eur. — Asturias*: foot of wet calcareous rocks c. 1400—1500 m, slopes of Peña Santa de Enol, 6. VII., V. A.

Pseudoscleropodium purum (Hedw. Fleisch. — Huesca: with *Camptothecium lutescens* on alluvial gravel with *Hippophae*, *Berberis vulgaris*, etc., near Biescas, 1. VII., V. A.

Pleurozium schreberii (Brid.) Mitt. — Logroño*: heath of *Calluna*, *Erica aragonensis*, etc., c. 1700 m, Puerto de Piqueras, 2. VII., R.

Isopterygium seligeri (Brid.) Dix. (*Plagiothecium silesiacum* [Selig.] Bry. Eur.), *Isopterygium repens* (Poll. [Lindb.]) — Huesca: c. sp., rotten log in *Fagus-Abies* forest, c. 1320 m, Ordesa, 29. VI, R. First found in this locality by JEANBERNAT and RENAULD (1885). The only other locality known in the Peninsula appears to be Burguete in Navarra (P. ALLORGE, 1928).

I. elegans (Hook.) Lindb. — Lugo: Quercetum roboris, c. 500 m, by road from Vegadeo to Lugo, S. de Meira, 10. VII., R.

Plagiothecium piliferum (Sw.) Bry. Eur. — Santander: moist shaded conglomerate boulders near stream, in Fagetum, c. 1365 m, below Puerto de Piedras Luengas, 5. VII., R. This rare species has been recorded from the Picos de Europa (also in Prov. Santander) by LEVIER and from the Pyrenees in Prov. Lérida by JEANBERNAT. It has also been found by V. and P. ALLORGE in the following previously unpublished localities:— Huesca: c. sp., Baños de Panticosa, 1935, León: c. sp., forest of Pardomino, near Boñar, 1934.

All the material of the three following species (belonging to the *denticulatum* group) has been determined by Mr. S. W. GREENE (Bangor), using the nomenclature of JEDLICKA (1948).

P. denticulatum (Hedw.) Bry. Eur.** var. *obtusifolium* (Turn.) Hook. and Tayl. (*P. denticulatum* var. *donii* [Sw.] Lindb.) — Huesca: c. sp., crevices of granitic rocks, c. 2000—2200 m, about Brachimaña, Baños de Panticosa, 30. VI., V. A. Santander: rocks under *Fagus*, c. 1365 m, below Puerto de Piedras Luengas, 5. VII., R. This variety or subspecies, which has an arctic-alpine distribution, does not appear to have been recorded before from the Peninsula.

P. platyphyllum Mönkemeyer — León: base of tree trunk in a ravine, c. 1364 m, on road to Puerto de Pajares from Oviedo, 9. VII, V. A.

Another gathering probably of the same species (but material somewhat inadequate for certain determination) was the following:— Santander: boulder in Fagetum, c. 1365 m, Puerto de Piedras Luengas, 5. VII., R.

P. neglectum Mönkemeyer (*P. silvaticum* [Brid.] Bry. Eur. p. p.) — Asturias: c. sp., on humus under *Fagus*, in ravine, c. 500 m, near Arriondas, 6. VII., R. Quercetum roboris near Infiesto, I. VII., R.

P. undulatum (Hedw.) Bry. Eur. — Asturias: under *Fagus* in ravine, c. 500 m, near Arriondas, 6. VII., R.

Hypnum cupressiforme (Hedw. var. *resupinatum* (Wils.) Schp. — Asturias: on trunk of *Fagus* in ravine, c. 500 m, near Arriondas, 6. VII., R.

var. *ericetorum* Bry. Eur. — Asturias*: damp heath c. 700 m, north aspect, Puerto Sueve, Arriondas, 6. VII., R.

Hycomium flagellare Bry. Eur. — Asturias: on siliceous rocks in stream under *Fagus*, c. 300—500 m, near Arriondas, 6. VII., R.

Rhytidiadelphus loreus (Hedw.) Warnst. — Asturias: rocks near summit of Puerto Sueve, c. 700 m, Arriondas, 6. VII., R. Lugo: siliceous talus in wood, c. 500 m, by road from Vegadeo to Lugo, S. de Meira, 10. VII., V. A.

Rhytidium rugosum (Hedw.) Kindb. — Huesca: among grass between *Buxus*, c. 1000 m, slopes round the lake, Parador de Arguis, 28. VI., V. A.

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