BRYOPHYTES OF THE JORNADA EXPERIMENTAL RANGE, NEW MEXICO

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A small collection of bryophytes was made on the Jornada Experimental Range in southern New Mexico by the writer as a spare-time study in 1934 and 1935. The number of species represented, about 25, is considerably less than that of Brother Arsène's[1] collections in the higher mountain zones of northern New Mexico. Twelve of these species, indicated by an asterisk in the list below, were not cited by Brother Arsène.

Inasmuch as differences in bryophyte flora are largely the result of differences in environmental conditions, the physiography and climate of the Jornada Experimental Range will be reviewed briefly. This range, with an area of 302 square miles, is north of Las Cruces, Dona Ana County, and is located in one of the sections of least rainfall of the State. For the most part it is a plain which varies in elevation from 4,000 to 4,600 feet. It is a part of the Lower Sonoran Life Zone, with unconsolidated sands, adobe, and gravel and without springs and streams. On the east border, San Andres Mountains and foothills, composed chiefly of upper Paleozoic limestone with some sandstone and shale, rise to a maximum elevation of 8,000 feet in the Upper Sonoran Life Zone. The average annual rainfall is 8.97 inches on the plain at the range headquarters, elevation 4,150 feet, and 12.61 inches in the foothills at Ropes Spring, elevation 5,600 feet. Collections were made also in Dona Ana Mountains of igneous rock at the southwestern edge of the area. The vegetation of this section, mainly semidesert-shrub and grassland types, has been described by Campbell[2] and others.

Bryophytes, which are dependent upon water for fertilization, naturally are rare in this region where water is scarce. On the plain they occur in the shade of shrubs and grasses, rarely in the open sunlight. Most of them are confined to the mountains and foothills, where rock crevices and ledges furnish shade and retain moisture longer than elsewhere in this region. Several springs in the mountains have representatives of a few species of mosses around them. More species are represented on the top of the east side of San Andres Peak, elevation 8,000 feet, than on the west slope. Trees and logs are too scarce and too exposed to serve as habitats but members of the species *Orthotrichum diaphanum* were found on a

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[1] Arsène, G. Hépatiques du Nouveau-Mexique (U. S. A.) déterminées par Miss Caroline Coventry Haynes. Ann. Crypt. Exot. **6**: 150–160. 1933.

Bartram, Edwin B. Mosses of northern New Mexico collected by Bro. Arsène. Ann. Crypt. Exot. **4**: 153-160. 1931.

[2] Campbell, R. S. Vegetative succession in the Prosopis sand dunes of southern New Mexico. Ecology **10**: 392–398. 1929.

Campbell, R. S. Plant succession and grazing capacity on clay soils in southern New Mexico. Jour. Agr. Res. **43**: 1027–1051. 1931.

few tree trunks. Most of these liverworts and mosses, like the higher plants here, may be classed as xerophytes. The only kind of hydrophyte is *Didymodon tophaceus*. Although all bryophytes here are rare, the kinds most commonly seen are *Weisia viridula*, *Bryum argenteum lanatum*, *Tortula montana*, and *Coscinodon Wrightii*.

The family Pottiaceae, which is especially characteristic of the Southwest, is relatively well represented by 9 species, 6 of which were not listed from northern New Mexico.

The species of liverworts were determined by the late Dr. Marshall A. Howe and the kinds of mosses, by R. S. Williams, both of the New York Botanical Garden, to whom the writer is indebted.

Duplicate sets of the specimens have been deposited in the Herbarium of the New York Botanical Garden; in the U. S. Forest Service herbaria at Washington, D. C., Albuquerque, N. M., on the Jornada Experimental Range, and in the writer's personal herbarium. A list of the species with notes follows:

Liverworts

Riccia Frostii Aust. Not found on the Jornada Experimental Range but very common on moist clay flats, exposed bed of Rio Grande near Las Cruces. Nov. 4, 1934.

Plagiochasma rupestris (Forst.) Steph. Common locally on shallow soils in shaded crevices of rock outcrops, on limestone ledges in San Andres Mountains, and quartz monzonite in Dona Ana Mountains.

Mosses

*Moenkemeyera Littlei Williams.[1] On shaded vertical walls of three gypsum sinks (2 to 8 feet below surface), gypsum deposits of plain, 1½ miles north of Middle Well, sec. 25, T. 18 S., R. 1 E., M. M. principal meridian. Apparently this collection is the second record of the genus *Moenkemeyera* (family Fissidentaceae) in North America. *Moenkemeyera Neoni* Bartram[2] has been described previously from Louisiana and about 10 other species of this genus are known from South America and Africa.

*Barbula gracilis (Schleich.) Schwaegr. In shaded crevices of limestone, summit of San Andres Peak.

*Desmatodon Guepini B. & S. On shaded gravelly soil, north side of grasses, foothills.

*Desmatodon plinthobius Sull. & Lesq. On soil in shaded crevices of limestore and sandstone, foothills.

Didymodon luridus Hornsch. On dry shaded limestone boulder, edge of canyon bed, Ash Spring.

Didymodon tophaceus (Brid.) Jur. Common locally on moist limestone

[1] Williams, R. S. Moenkemeyera Littlei, sp. nov., Bryologist **39**: 40–41. Pl. IV. 1936.
[2] Bryologist **34**: 77–78, pl. V. 1931.

outcrops and shallow soil at several springs in San Andres Mountains. Carbonate of lime is deposited around tufts of this moss.

*PTERYGONEURUM CAVIFOLIUM (Ehrh.) Jur. Associated with *Desmatodon Guepini* on gravelly soil on north side of grasses, foothills.

*TORTULA INERMIS (Brid.) Mont. Shaded limestone crevices, San Andres Mountains.

*TORTULA MONTANA (Nees) Lindb. On shaded limestone outcrops, crevices, and rocky soil, San Andres Mountains and foothills. Also on gravel at base of quartz monzonite boulders, Dona Ana Mountains.

WEISIA VIRIDULA (L.) Hedw. Common locally in shaded crevices of sandstone and limestone outcrops, San Andres Mountains and foothills. Also on shallow soil in crevices of quartz monzonite boulders, Dona Ana Mountains.

COSCINODON WRIGHTII (Aust.) Sull. On soil and on rock in crevices of limestone ledges, foothills, and San Andres Mountains.

GRIMMIA ANODON B. & S. In shaded crevices and on shaded and exposed ledges, limestone outcrops, San Andres Mountains.

*GRIMMIA CONFERTA OBTUSIFOLIA Schimp. On limestone gravelly soil with grass, San Andres Mountains.

*GRIMMIA PULVINATA Smith. In crevices of quartz monzonite outcrop, Dona Ana Mountaims.

FUNARIA HYGROMETRICA (L.) Sibth. Moist soil near water, Ropes Spring.

BRYUM ARGENTEUM LANATUM B. & S. Common locally. Collected on plain on north side of mesquite sand dunes and in shade of tobosa grass, adobe soil. Found also in crevices of limestone, San Andres Peak and foothills.

*BRYUM INTERMEDIUM Brid. On moist soil, canyon in Organ Mountains about 15 miles southeast of Jornada Experimental Range.

BRYUM SPP. Sterile specimens of 2 species were collected, one on adobe in the plain and the other on moist clay soil and limestone near springs in San Andres Mountains.

*ORTHOTRICHUM DIAPHANUM (Gmel.) Schrad. Rare on bark at base of trees, chiefly ash, along springs in San Andres Mountains.

*FABRONIA WRIGHTII Sull. On shaded gravelly soil and in crevices, quartz monzonite outcrops, Dona Ana Mountains. Also at base of small tree along spring in San Andres Mountains.

PSEUDOLESKEELLA TECTORUM FLAGELLIFERUM Best. On shaded limestone bluff and boulders, east side of summit of San Andres Peak.

BRACHYTHECIUM COLLINUM (Schleich.) B. & S. On shaded limestone outcrops, San Andres Mountains.

HYPNUM CUPRESSIFORME L. On shaded limestone ledges, east side of summit of San Andres Peak. Variety *elatum* B. & S. was collected at the same place.

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