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SHORTER NOTES

New Records of Pteridophytes in the Semi-Arid Region of Brazil.—In Brazil, 70% of the Northeast region, including the northern portion of the state of Minas Gerais, is covered by semi-arid vegetation. The state of Pernambuco, for example, has a total area of 98,079 km^2, of which 60,000 km^2 is covered by typical caatinga vegetation (Egler, Rev. Bras. Geog.13: 65–78. 1951; Sampaio, pp. 35–63 *in* Bullock and Davidse, *Seasonally Dry Tropical Forest,* 1995).

Since water deficiency appears to be the key factor in limiting the occurrence of pteridophytes in seasonally dry tropical areas, there are relatively few species of pteridophytes known from semi-arid regions or caatinga vegetation. Nevertheless, a few species of pteridophytes are well adapted to survival in such areas (Kornás, pp. 391–395 *in* Dyer and Page, *Biology of Pteridophytes,* 1985). For Peru, Tryon (Cont. Gray Herb. 194:1–253. 1964), records 176 native species of pteridophytes across four vegetation types, including the xeric Sierra Steppe and Scrub vegetation. Also many members of the Pteridaceae, Tribo Cheilantheae, have been found in the xeric and semixeric regions of central and northeastern Mexico (Tryon & Tryon, 1982, *Ferns and allied plants, with special reference to tropical America*). Other works refer to the occurrence of pteridophytes in the dry environments of Africa (Kornás, Acta Soc. Poloniae 46:669–690. 1977), and in Australia the genus *Cheilanthes* is noted for its ability to survive in low humidity conditions (Quirk & Chambers, Fern Gaz. 12:121–127. 1981). In Brazil, Barros *et al.* (Biol. Bras.1: 143–159. 1989) have documented nine species of pteridophytes in the caatinga vegetation of Pernambuco.

The goal of this paper is to enumerate the pteridophytes that occur in the semi-arid region of the State of Pernambuco, Brazil, document three new records, and add information about the habitat preferences of these plants.

Pteridophytes were collected in Petrolina (90°09'S, 40°22'W), which is situated in the semi-arid region of Pernambuco, northeastern Brazil. This area is located at an altitude of 365 m in a region known as the Sertaneja Depression. The climate is characterized by extended dry periods alternating with ephemeral rains. The region corresponds to type BSwh, of Köppen's system (Embrapa, 1993. *Zoneamento Agroecológico do Nordeste*) and the annual rainfall is 510 mm. The vegetation is xerophytic, with Bromeliaceae and Cactaceae being especially representative (Egler, Rev. Bras. Geog.13:65–78. 1951)

Species identifications were carried out using Alston *et al.* (Bull. Brit. Mus. Nat Hist. 9:233–330. 1981), Proctor (Bull. Brit. Mus. Nat Hist. 7:3–5. 1985), Mickel & Beitel (Mem. New York Bot. Garden 46:1–568. 1988), and Tryon & Stolze (Fieldiana Bot. 29:1–80. 1992). Voucher specimens are deposited in TSAH, the herbarium of the Tropical Semi-Arid Agricultural Research Center—Embrapa (Brazil).

Acrostichum danaeifolium Langsd. & Fisch. [*Ambrósio 55,* TSAH 1728

&1729], *Thelypteris interrupta* (Willd.) Iwatsuki [*Ambrósio s.n.*, TSAH 1721], and *Marsilea quadrifolia* L. [*Ambrósio 52,* TSAH 1723] are recorded for the first time in the Brazilian semi-arid region. *Thelypteris interrupta* and *A. danaeifolium* were found to be common in humid soils of the caatinga, near irrigation channels. These species probably colonized the region naturally with the advent of modified habitats as niches became available for their survival. Tryon (Cont. Gray Herb.194:1–253.1964) observed that, in Peru, non-native species have become naturalized along irrigation channels or in areas that become more mesic as a result of their presence. *Marsilea quadrifolia* occurs in aquatic environments, such as rivers and streams and, according to Allsopp (Nature 169:79–80.1952), members of the genus are probably able to survive drought conditions due to their desiccation resistant sporocarps. Kornás (*in* Dyer and Page, *Biology of Pteridophytes,* 1985) also comments upon the occurrence of pteridophytes in areas where the climate is extremely dry, as in deserts or sub-desert regions of tropical Africa. *Thelypteris* and *Marsilea* are among the genera that have been found there.

Anemia tomentosa (Sav.) Sw. var. *tomentosa* [Ambrósio *54,* TSAH 1724], *Pityrogramma calomelanos* (L.) Link. var. *calomelanos* [*Ambrósio 51,* TSAH 1725], *Selaginella convoluta* (Arn.) Spring [*Ambrósio 53,* TSAH 1722], *S. sellowi* Hieron. [*Ambrósio s.n.*, TSAH 1726], and *Azolla microphylla* Kaulf [*Ambrósio 61,* TSAH 1727 & 1730] were also collected from Petrolina. These species have previously been reported from other semi-arid regions of Brazil (Barros *et al.,* Biol. Bras. 1:143–159.1989). In their floristic survey, Barros *et al.* also reported *Anemia villosa* Humb. & Bonpl. Ex Willd., *Anemia oblongifolia* (Cav.) Sw., *Hemionitis tomentosa* (Lam.) Raddi., *Polypodium polypodioides* (L.) Watt., and *P. hirsutissimum* Raddi. as part of the vegetation of the caatinga. The most notable pteridophyte of the semi-arid region is certainly *S. convoluta,* the poikilohydrous type, also observed by Morelo (Rev. Bras. Biol. 14:83–108. 1954). This reviviscent species has physiological characters that confer resistance to hydric stress; they curl up and remain alive through the drought, unfolding each time they are moistened (Rawistscher *et al.*, An. Acad. Bras. Ciên. 21: 287–301. 1952). Although pteridophytes are uncommon in xeric environments, especially when compared to areas with more mesic edafoclimatic conditions (Ambrósio and Barros, Acta Bot. Bras. 11:105–113. 1997), they are becoming increasingly documented and studied (Kornás, Acta Soc. Poloniae 46:669–690. 1977, and other references above). The three new records discussed above are intended to show that the distribution of pteridophytes in xeric regions remains still largely undocumented.

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