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SHORTER NOTE(S)

Binomial for *Dryopteris clintoniana* × *goldiana*.—One strikingly handsome *Dryopteris* hybrid, the largest of all North American temperate *Dryopteris* (Thorne, F. and L. Thorne. 1989. *Henry Potter's Field Guide to the Hybrid Ferns of the Northeast.* Vermont Institute of Natural Science, Woodstock, VT) and an excellent fern for hardy gardening (Mickel, J. T. 1994. *Ferns for American Gardens.* Macmillan, New York, NY), is without a collective epithet: *D. clintoniana* × *goldiana.*

Dryopteris ×mickelii Peck, *hyb. nov.*—TYPE: UNITED STATES, New Jersey, Sussex Co., west side of extensive swamp south of Big Spring, 3 km south of Springdale, 17 Oct. 1969, *James D. Montgomery 90895n* (NY).

Planta hybrida inter Dryopterem clintonianam et D. goldianam, aliis characteribus inter parentes media, sporis abortivis.

The hybrid is named to honor Dr. John Thomas Mickel (1934–) for his many endeavors on North American fern taxonomy, floristics, and horticulture, particularly his promotion of gardening with hardy ferns. The hybrid is distinguished readily from its parents by its abortive and irregular sized spores, intermediate frond morphology, and shared characters with both parents (see table in Thorne and Thorne, 1989, page 34). *Dryopteis ×mickelii* has fronds up to 160 cm long, stipe to frond length ratio of 1:4, and is covered moderately with brown to dark brown scales. The blade is about 120 cm long, with a width to length ratio of about 2:5, with a very long and broad outline. The pinnae are regularly spaced, ascending relative to the rachis, with pinna shape wide, long rectangular and acuminate. Sori are borne close to the pinnule midrib. *Dryopteris ×mickelii* shares with *D. clintoniana* the following features: dark coloration at base of scales, relative length of blade, pinnae ascending from rachis, relatively narrow blade, and intermediate sorus location. *D. ×mickelii* shares with *D. goldiana* the following features: wide blade, length of pinnules, falcate pinnules, relatively dark scales, and shape of pinnae.

This hybrid occurs in rare and local populations in southern Ontario, south to New York, New Jersey, and Pennsylvania, and westward as outliers in Michigan and Ohio. This relatively narrow geographic range reflects the geographic overlap of the two parental ranges in the northeastern region of North America. The habitat of wetland woods and swamps were more common in early postglacial times, but have declined since then, particularly in the western one-half of the range. In nature, the hybrid warrants conservation efforts wherever it still occurs.

PARATYPES.—CANADA. **Ontario**: in woods at Ottawa, *Scott s. n.* (NY). UNITED STATES: **Michigan**: Washtenaw Co.: deep yellow birch swamp in Irwin's woods, *Wagner 9458* (US); Tuscola Co.: south of Murphy Lake, *Wagner 63051* (US); tamarack swamps at Oxford, *Farnwell 6117* (US). **New Jersey**:

Sussex Co.: swamp west of Springdale at Big Spring near Newton, *Dowell 4929* (NY, US), *Dowell 5033* (NY); Sussex Co.: roadside 1 mi south of Greendell, *Edwards s. n.* (NY); Bearfort Mtn., *W. D. Miller 1648* (NY); West Englewood, *Carhart 2b* (NY) 2 sheets. **New York:** Green Lake, Jamesville, *W. R. Dunlop s. n.* (NY); Harris Swamp near Pilot Knob, *Benedict s. n.* (US-2202218); Kirkville, *L. M. Underwood s. n.* (NY); Staten Island: Arlington Station, *Dowell 2801a & b* (US). **Ohio:** Geauga Co.: *Hopkins s. n.* (NY). **Pennsylvania:** Berks Co.: swamp along spring-run 1.5 mi ne of Bernharts, *Wherry s. n.* (US-1849217); Delaware Co.: valley of Cruise Creek, *Poyser 1286* (NY); Wakefield, Lanbor, *J. J. Carter s. n.* (NY). **Vermont:** N. Lynnfret (Limfret?), *A. P. & L. V. Morgan s. n.* (US-154517).

In the garden, its vegetative propagation should be promoted and supplemented with modern tissue culture techniques to meet horticultural demands. It is a large and vigorous fern that forms extensive colonies through vegetative expansion while under cultivation. One specimen from New York was planted at the New York Botanical Garden, Bronx, NY in 1960 by members of the American Fern Society. Thirty-five years later, that plant had formed a clone 4 m across with over 200 apices (Mickel, 1994). JAMES H. PECK, Department of Biology, University of Arkansas at Little Rock, 2801 S. University Ave., Little Rock, AR 72204.

Cryopreservation of Shoot Tips of *Selaginella uncinata*.—Cryopreservation, or storage in liquid nitrogen (LN), has been successful for a wide variety of plant tissues, including shoot tips of *in vitro* cultures of higher plants (Bajaj, *In* Y. P. S. Bajaj, *Cryopreservation of Plant Germplasm I, Biotechnology in Agriculture and Forestry* 32. Springer, Berlin, 1995). At the temperature of LN, −196°C, long-term, stable storage of rare, endangered, or other valuable plant germplasm can be achieved. In an attempt to extend this technology to pteridophytes, LN storage of shoot tips of *in vitro* grown *Selaginella uncinata* was tested using the encapsulation dehydration procedure (Fabre and Dereuddre, Cryo-Letters 11:413–426, 1990).

Shoot cultures of *Selaginella uncinata* (Desv. ex Poir.) Spring. were established from a plant purchased from Carolina Biological Supply Co. (voucher specimens deposited at the University of Cincinnati Herbarium, CINN, and at the CREW Herbarium). Tissues were surface disinfested in a 1:20 dilution of commercial sodium hypochlorite for five minutes, followed by two rinses in sterile, ultrapure water. The tissues were then transferred to a basal medium consisting of half-strength Murashige and Skoog salts with minimal organics (MS medium; Linsmaier and Skoog, Physiol. Plant. 18:100–127, 1965) with 1.5% sucrose and 0.22% Phytagel (Sigma Chemical Co.). Cultures were maintained on this medium in 60 × 15 mm plastic petri plates, approximately 15 ml of medium/plate, at 26°C under Cool White fluorescent lights with a 16:8 hr, light:dark cycle. For preculture, one week prior to freezing the tissues were transferred to fresh basal medium or to basal medium plus 10 μM abscisic acid (ABA), which was filter sterilized and added to the medium after autoclaving.