

CULTIVATED LOWER VASCULAR PLANT
AND GYMNOSPERM TAXA
AT THE NC STATE UNIVERSITY HERBARIUM

PAUL R. FANTZ, F. TODD LASSEIGNE AND DIANE MAYS

Department of Horticultural Science

North Carolina State University

Raleigh, NC 27695-7609

Paul_Fantz@ncsu.edu

ABSTRACT

A list of cultivated lower vascular plant and gymnosperm taxa held at the North Carolina State University Herbarium (NCSC) is presented as part of a larger effort to catalogue the holdings of the herbarium. Cultivated taxa of lower vascular plants include 12 families, 18 genera and 24 species. Cultivated taxa of gymnosperms include 9 families, 25 genera, 38 species and 91 subspecific taxa.

Krings (2002) and Fantz et al. (2003, 2004) provided a list of cultivated dicotyledonous and monocotyledonous taxa currently deposited at the North Carolina State University Herbarium (NCSC) as part of a larger effort to catalogue all of the specimen holdings of NCSC. Cultivated gymnosperm vouchers consisted of fifteen taxa and zero taxa of lower vascular plants. Fantz began the task in 2002 of vouchering the cultivated taxa at the JC Raulston Arboretum (JCRA) and the Greenhouse Conservatory of the Department of Horticultural Science as part of Hatch Research Project (NCO 6104). In addition, he added the vouchers of a former graduate student, Bob Rouse, who had collected vouchers for a project on arbovitae before switching to cultivated *Cryptomeria japonica* D. Don. for a master's thesis, also under NCO 6104. This Hatch project has substantially increased the number of cultivated taxa deposited at NCSC. The objective is to continue the cataloguing of cultivated plants initiated by Curator Alexander Krings with the addition of the lower vascular plant and gymnosperm taxa currently held at NCSC.

METHODS

Plant vouchers were prepared by Fantz following standard taxonomic vouchering procedures. Priority was given to collecting different species and those plants in the reproductive state. Lower priority went to multiple cultivars of a species. Vouchering of the plants at the JC Raulston Arboretum began in April 2002. Vouchering of the Greenhouse Conservatory began in November 2002. Collection of duplicate specimens began in June 2002 after the North Carolina State University Herbarium (NCSC) developed an exchange program with the National Arboretum Herbarium (NA). Rouse vouchers were collected in 1994-1996.

Labels were prepared for each voucher. Names were checked against Griffiths (1994) for current correct scientific names and authorities. The international plant name index database (IPNI 2002) was consulted for those names lacking in Griffiths (1994). Synonyms were included on plant labels. An alphabetical list of taxa was prepared that included correct scientific names, authorities, synonyms, voucher number, plant state (sori, cones) and herbarium of deposit.

A list of arboretum plant vouchers was turned over to Lasseigne, Assistant Director of the JC Raulston Arboretum, whose responsibilities include plant records. He is having the voucher data added to the JC Raulston Arboretum plant records database. A list of greenhouse vouchers was turned over to Diane Mays, Agricultural Research Technician II. She is adding voucher data to the greenhouse plant records database. Added to these are the names of gymnosperm and lower vascular plant taxa compiled from taxon folders.

RESULTS

Taxa are arranged first by lower vascular plant taxa, then by gymnosperm taxa. Within each group, taxa are arranged alphabetically by family, genus, species, and subspecific taxa. The number of genera and subgeneric taxa follows family names (e.g., 5/8 indicates 5

genera comprising 8 subgeneric taxa). A scientific name not located in Griffiths or IPNI is cited as *nomina in schedula* [*nom. in sched.*]. Taxa added under Hatch Research Project NCO 6104 are designated by an asterisk (*).

Verification of scientific names revealed a number of orthographic errors on plant labels and in plant records, use of synonyms, and phantom plants, the latter being plants in the collection but lacking in record databases. Lasseigne and Mays are correcting these errors on new plant labels and in the JC Raulston Arboretum and NCSU Greenhouse databases.

Lower vascular plants. Cultivated taxa include 12 families, 18 genera and 24 species, all additions (100%) resulting from NCO 6104. Included is *Lepisorus bicolor* (Polypodiaceae), noted by the JCRA staff as the rarest fern in the world; however, no record of the binominal name has been found in standard references and indexes. The Dryopteridaceae represent the largest holdings currently with 4 genera and 7 species.

Gymnosperms. Cultivated taxa include 9 families, 25 genera, 38 species and 91 subspecific taxa. The holdings at NCSC doubled from NCO 6104 efforts. This included adding 44% new families, 64% new genera and 65% new species. The number of subspecific taxa increased 98%. The two largest families are the Cupressaceae (including Taxodiaceae) and the Pinaceae. The Cupressaceae includes 12 genera, 16 species and 87 subspecific taxa. Most of the holdings result from collections of Bob Rouse that include *Cryptomeria* D. Don (Rouse et al. 2000) and arbor-vitae (*Platycladus* Spach., *Thuja* L., and *Thujopsis* Sieb. & Zucc.). Cycads are represented by two genera (*Cycas* and *Zamia*) and species. Yews are represented by two genera (*Podocarpus* and *Taxus*) and four species. Junipers, one of the dominant plant groups in cultivation here, are represented by only one species.

Lower vascular plants

ADIANTACEAE 1/2

*Cheilanthes**

- C. argentea* (Gmel.) Fee*
- C. lanosa* (Michx.) D.C. Eaton*

BLECHNACEAE 1/1

*Doodia**

- D. media* R. Br.*

DAVALLIACEAE 1/2

*Davallia**

- D. fejeensis* Hook.*
- D. mariesii* Moore ex Bak.*

DRYOPTERIDACEAE 4/7

*Arachniodes**

- A. simplicior* (Nak.) Ohwi*

*Cyrtomium**

- C. fortunei* J. Sm.*

*Dryopteris**

- D. x complexa** [*nom. in sched.*]
- D. erythrosora* (Eaton) Kuntze*
- D. ludoviciana* (Kunze) Small*
- D. sieboldii* (Moore) C.Chr.*

*Polystichum**

- P. tsussimense* (Hook.) J. Sm.*

MARATTIACEAE 1/1

*Angiopteris**

- A. erecta* (Forst.) Hoffm.*

OSMUNDACEAE 1/1

*Osmunda**

- O. regalis* L.*

POLYPODIACEAE 3/3

*Lepisorus**

- L. bicolor** [No record of name found]

*Platycterium**

- P. stemaria* (Beauv.) Desv.*

*Pyrrosia**

- P. hastata* (Thunb.) Ching*

PSILOTACEAE 1/1

*Psilotum**

- P. nudum* (L.) Beauv.*

PTERIDACEAE 1/1

*Pteris**

- P. sp.**

SCHIZAEACEAE 1/1

*Lygodium**

- L. japonicum* (Thunb.) Sw.*

SELAGINELLACEAE 1/1

*Selaginella**

- S. braunii* Bak.*

WOODSIACEAE 2/3

*Athyrium**

- A. filix-femina* (L.) Roth 'Frizelliae'*
- A. nipponicum* (Matt.) Hance*

*Matteuccia**

- M. struthiopteris* (L.) Tod.*

Gymnosperms**ARAUCARIACEAE 1/2****Araucaria***

- A. araucana* (Molina) K. Koch.*
A. heterophylla (Salisb.) Franco*

CUPRESSACEAE 12/103**Chamaecyparis***

- C. thyoides* (L.) BSP
C. thyoides (L.) BSP 'Dilworth
 Variegated'

Cryptomeria*

- C. japonica* D. Don*
C. japonica D. Don var. *radicans*
 Nakai*
C. japonica D. Don subsp. *sinensis*
 (Miq.) P.D. Sell*
C. japonica D. Don 'Araucarioides'*
C. japonica D. Don
 'Argentovariegata'*
C. japonica D. Don 'Aurea'*
C. japonica D. Don 'Benjamin Frank-
 lin'*
C. japonica D. Don 'Black Dragon'*
C. japonica D. Don 'Bloomers
 Witches Broom'*
C. japonica D. Don 'Buckiscope'*
C. japonica D. Don 'Compressa'*
C. japonica D. Don 'Cristata'*
C. japonica D. Don 'Dacryioides'*
C. japonica D. Don 'Elegans'*
C. japonica D. Don 'Elegans Aurea'*
C. japonica D. Don 'Elegans Com-
 pacta'*
C. japonica D. Don 'Elegans Nana'*
C. japonica D. Don 'Giokumo'*
C. japonica D. Don 'Globes'*
C. japonica D. Don 'Globosa'*
C. japonica D. Don 'Globosa Nana'*

- C. japonica* D. Don 'Gracilis'*
C. japonica D. Don 'Green Pencil'*
C. japonica D. Don 'Ikar'*
C. japonica D. Don 'Jindai-sugi'*
C. japonica D. Don 'Kilmacurragh'*
C. japonica D. Don 'Knaptonensis'*
C. japonica D. Don 'Kokuryu'*
C. japonica D. Don 'Littleworth
 Dwarf'*
C. japonica D. Don 'Lobbii'*
C. japonica D. Don 'Lobbii Nana
 Aurea'*
C. japonica D. Don 'Monstrosa'*
C. japonica D. Don 'Monstrosa
 Nana'*
C. japonica D. Don 'Nana'*
C. japonica D. Don 'Nana Albos-
 pica'*
C. japonica D. Don 'Pomona'*
C. japonica D. Don 'Sekkan'*
C. japonica D. Don 'Spiralis'*
C. japonica D. Don 'Spiraliter Fal-
 cata'*
C. japonica D. Don 'Taisho-tama'*
C. japonica D. Don 'Tansu'*
C. japonica D. Don 'Tenzan'*
C. japonica D. Don 'Vilmoriniana'*
C. japonica D. Don 'Winter Mint'*
C. japonica D. Don 'Yellow Twig'*
C. japonica D. Don 'Yokohama'*
C. japonica D. Don 'Yoshino'*

Fokienia*

- F. hodginsii* (Dunn) Henry & Thom.*

Glyptostrobus

- G. pensilis* (Staunton) Koch.

Juniperus*

- J. phoenicea* L.*

Metasequoia*

- M. glyptostroboides* H.H. Hu &
 Cheng

Microbiota

- M. decussata* Kamarov

Platykladus*

- P. orientalis* (L.f.) Franco*
P. orientalis (L.f.) Franco 'Aurea
 Densa'*
P. orientalis (L.f.) Franco 'Aurea
 Nana'*
P. orientalis (L.f.) Franco 'Filiformis
 Erecta'*
P. orientalis (L.f.) Franco
 'Fruitlandii'*
P. orientalis (L.f.) Goodwin
 'Goodwin'*
P. orientalis (L.f.) Franco
 'Meldensis'*
P. orientalis (L.f.) Franco
 'Westmont'*

Sciadopitys*

- S. verticillata* Sieb. & Zucc.

Thuja*

- T. sp.**
T. koraiensis Nak.*
T. koraiensis Nak. x *Thuja standishii*
 (Gordon) Carr.*
T. occidentalis L. 'Emerald'*
T. occidentalis L. 'Fastigata'*
T. occidentalis L. 'Filiformis'*
T. occidentalis L. 'George Washing-
 ton'*
T. occidentalis L. 'Globosa'*
T. occidentalis L. 'Hetz Midget'*
T. occidentalis L. 'Juniperoides'*
T. occidentalis L. 'Hoseri'*
T. occidentalis L. 'Little Gem'*
T. occidentalis L. 'Ohlandorfii'*
T. occidentalis L. 'Pendula'*
T. occidentalis L. 'Pumila Sud-
 worth'*
T. occidentalis L. 'Pyramidalis'*
T. occidentalis L. 'Sherwood Frost'*

- T. occidentalis* L. 'Sudworth Gold'*
T. occidentalis L. 'Sudworth Yel-
 low'*
T. occidentalis L. 'Umbraculifera'*
T. occidentalis L. 'University of Con-
 necticut'*
T. occidentalis L. 'University of Con-
 necticut Dwarf'*
T. occidentalis L. 'Wansdyke Silver'
T. plicata D. Don*
T. plicata D. Don 'Albospicata'*
T. plicata D. Don 'Aurea'*
T. plicata D. Don 'Cuphea'*
T. plicata D. Don 'Filiformis'*
T. plicata D. Don 'Hogan'*
T. plicata D. Don 'Pygmea'*
T. plicata D. Don 'Pygmea'*
T. plicata D. Don 'Stoneham Gold'*
T. plicata D. Don 'Zebrina'*
T. standishii (Gordon) Carr.*

Thujopsis*

- T. dolobrata* Sieb. & Zucc.*
T. dolobrata Sieb. & Zucc. var *hon-
 dae* Mak.*
T. dolobrata Sieb. & Zucc.
 'Latifolia'*
T. dolobrata Sieb. & Zucc. 'Nana'*
T. dolobrata Sieb. & Zucc.
 'Variegata'*

Widdringtonia*

- W. nodiflora* (L.) Powrie*

CYCADACEAE 1/1**Cycas**

- C. revoluta* Thunb.

EPHEDRACEAE 1/1**Ephedra***

- E. americana* Humb. & Bonpl.*

GINKGOACEAE 1/1

Ginkgo

G. biloba L.

T. wallichiana Zucc. var. *mairei*
(Lemée & H.Lév.) L.K. Fu & Nan
Li*

PINACEAE 6/12

*Abies**

A. firma Sieb. & Zucc.

Cedrus

C. deodara (D. Don) G. Don*

C. libani A. Rich. ssp. *atlantica*
(Endl.) Battand. & Trabut

Keteleeria

K. davidiana (Bertr.) Beissn.

Picea

P. abies (L.) Karst.

P. orientalis (L.) Link

P. rubens Sarg.

Pinus

P. sp.

P. virginiana Mill.

P. wallichiana A.B. Jackson
'Zebrina'*

P. washoensis H. Mason & Stochw. x

P. ponderosa Doug. ex C. Larson
var. *scopularum* S. Wats.

Pseudolarix

P. amabilis (J. Nels.) Rehd.

PODOCARPACEAE 1/2

*Podocarpus**

P. alpinus R. Br. ex Hook. f.*

P. nivalis Hook.*

TAXACEAE 1/2

*Taxus**

T. chinensis (Pilfer) Rehd.*

ZAMIACEAE 1/1

*Zamia**

Z. furfuracea L.f. in Ait.*

ACKNOWLEDGEMENTS

The authors appreciate the editorial review by Kevin Conrad (NA).

LITERATURE CITED

FANTZ, P.R., F.T. LASSEIGNE, and D. MAYS. 2003. Cultivated dicotyledonous taxa at the NC State University Herbarium II: additions to the collections in 2002. *Vulpia* 2:81-93.

FANTZ, P.R., F.T. LASSEIGNE, and D. MAYS. 2004. Cultivated monocotyledonous taxa at the NC State University Herbarium. *Vulpia* 3:32-42.

GRIFFITHS, M. 1994. Index of garden plants. Timber Press, Portland.

IPNI. 2003. International Plant Name Index Query, The Royal Botanical Gardens, Kew. [http://www.ipni.org/ipni/query_ipni.html]

KRINGS, A. 2002. Cultivated dicotyledonous taxa at the NC State University Herbarium. *Vulpia* 1:133-156.

ROUSE, R.J., P.R. FANTZ, and T.E. BILDERBACK. 2000. Descriptions and a key to cultivars of Japanese cedar cultivated in the eastern United States. *HortTechnology* 10(2):252-266.