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Compiled by
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Cover photo: *Dipteris chinensis*, Yunnan, China (Klaus Mehlreter)

INTRODUCTION

In 2013 several large contributions on ferns and lycophytes were published such as Flora of China (Wu et al. 2013), Flora of Peninsular Malaysia (vol. 2, Parris et al. 2013), Flora of the Four Corners Region (Heil et al. 2013) and the Red data book of the Flora of Brazil (Martinelli & Avila Morales 2013). For those volumes, we did NOT cite individual treatments of families and genera, because this would have substantially inflated this year's volume of ARPR. Please check the original books or their respective websites.

Research on ferns has progressed considerably and we found some publications especially interesting. Have you ever imagined that fur seals may negatively impact a fern population, e.g. *Blechnum penna-marina* (Hausmann et al. 2013)? How is it possible that *Diphasiastrum alpinum* gametophytes are epiparasitic on Ericaceae (Horn et al. 2013)? Which factors determine the uptake of gold nanoparticles by *Azolla caroliniana* (Glenn & Klaine 2013)? How do two epiphytic fern species facilitate each other (Jian et al. 2013)? Which plant species are the favorite resting places of the mosquito *Aedes albopictus* in Florida (Samson et al. 2013)? Which ferns do produce isoprene and why (Monson et al. 2013)? Spore dispersal of some ferns might not be restricted to wind. For example, *Asplenium setoi* seems to be dispersed by flying foxes as well (Sugita et al. 2013). *Equisetum* spores move individually and dance like artists in the supplementary movie provided by Marmottant et al. (2013). Some fern species provide important habitats for animals such as *Asplenium* as the favorite breeding habitat of the rare frog *Platymantis banahao* in the Philippines (Scheffer et al. 2013). Other ferns such as *Gleichenia japonica* are very competitive and achieve monotypic stands through allelopathy (Kato-Noguchi et al. 2013). Hopefully, you will find this edition interesting and helpful for your research, discussion or personal enlightenment. Ferns and lycophytes are indeed surprising organisms!

This *Annual Review of Pteridological Research* (ARPR, ISSN 1051-2926) provides a comprehensive list of 911 literature citations on ferns and lycophytes published during 2013, an index to authors and keywords, and a description of research interests and contact information of pteridologists who answered our annual questionnaire.

Joanne M. Sharpe supported this year's issue contributing database searches. Elisabeth Hooper took charge of the annual questionnaire, directory and research interests of respondents. Klaus Mehltreter compiled and formatted the literature citations and index. We hope that the continuous publication of ARPR will enhance access to information published about ferns and lycophytes worldwide and stimulate further collaboration among pteridologists. For any feedback on this year's issue, please contact Klaus Mehltreter, Instituto de Ecología, A. C., Red de Ecología Funcional, carretera antigua a Coatepec No. 351, El Haya, 91070 Xalapa, Ver., Mexico (klaus.mehltreter@inecol.mx).

If you are not on our mailing list but would like to receive information about how to be included in future issues, or if you would like to obtain back issues of the *Annual Review of Pteridological Research* please contact Elisabeth A. Hooper, Treasurer, International Association of Pteridologists, Biology Department, Truman State University, 100 E Normal Street, Kirksville MO 63501-4221 USA, (iapferns@gmail.com). On-line access to the literature from back issues since 1994 is available on the website of the American Fern Society (www.amerfernsoc.org).

Klaus Mehltreter, Xalapa
Elisabeth Hooper, Kirksville

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Ruth Aguraiuja	Population biology and restoration ecology of endangered fern species
Victor B. Amoroso	Botany; Economic ferns; Histochemical studies (medicinal ferns); Philippine <i>Cycas</i> ; Morphology and taxonomy
Sayuri Ando	Fern sporophyte development
Raju Antony	Systematic studies of <i>Selaginella</i> ; Ferns and conservation of ferns
Naomi Arcand	Ecology and biogeography of tree ferns
Ralph C. Archer	Fern horticulture
Nan C. Arens	Ecology of tree ferns
Yasmin S. Baksh-Comeau	Vascular flora of Trinidad and Tobago
Julie F. Barcelona	Philippine ferns/floristics; Ecology and conservation; <i>Odontosoria</i> systematics; Philippine <i>Rafflesia</i>
Wilfried H. Bennert	Ferns and lycopods
Subir Bera	Animal interaction with pteridophytes and its co-evolutionary significance
Rodica Bercu	Histo-anatomy of ferns
Kamlesh Bhakuni	Biodiversity, taxonomy and morphology of Central Himalayan ferns
S.S. Bir	Compilation of index to chromosome numbers of Indian pteridophytes
Michel Boudrie	Pteridophytes of France and of the Guianas (systematics, taxonomy, ecology, distribution)
Siegmar W. Breckle	Ecosystems of the Earth; Ecology of halophytes; Tropical ecology; Desert ecology
Walter Bujnoch	Ferns of Central Europe, especially <i>Dryopteris affinis</i>
Manuel G. Caluff	Selaginellaceae; Lycopodiaceae; Polypodiaceae (including Grammitidaceae); Fern culture; Ecology
Jian Guo Cao	Sexual reproduction and development of fern gametophytes
James D. Caponetti	Propagation of ferns by tissue culture
Francisco Carrapico	<i>Azolla</i> (general biology and taxonomy)
Kalyan Chakraborti	Phytogeography; Ecology; Fern lore; Ethnobotany

Wen-Liang Chiou	Gametophyte morphology and development; Reproductive biology; Antheridiogen; Phenology of sporophytes
Maarten Christenhusz	Fern floras; Island biogeography; Phytotaxa (journal)
Aurea M.T. Colli	Ecology and physiology
Marten W. de Boer	Pteridophytes of Bolivia and East Africa; Herbarium specimen collection
Joshua Der	<i>Pteridium</i> biogeography; Fern genomics and transcriptomics; RNA editing; Life cycle evolution
Shi-Yong Dong	Taxonomy of Asian tropical ferns; Pteridophyte flora of Southern China
Franz-Georg Dunkel	Rare ferns; Ecology and population biology
Adrian F. Dyer	The biology of soil spore banks and their potential in fern conservation; Ecology of fern gametophytes; Reproductive biology of <i>Woodsia ilvensis</i>
Atsushi Ebihara	Speciation; Gametophytes; Hymenophyllaceae
Murray Evans	Pteridophytes of the eastern United States; Taxonomy; Ecology; Natural history
Elizabeth Farnsworth	Ecology, Northeastern ferns; Illustration
Donald R. Farrar	Fern reproduction; <i>Botrychium</i> systematics
Kathryn Flinn	Ecology
Harald C. Frank	Tropical ferns in general; <i>Platycerium</i> ; Ant ferns; <i>Huperzia</i>
Christopher R. Fraser-Jenkins	Taxonomy; Floristics; Himalayan and all Asian ferns; <i>Asplenium</i> , <i>Athyrium</i> , <i>Cheilanthes</i> , <i>Diplazium</i> , <i>Dryopteris</i> , <i>Polystichum</i> , <i>Pteris</i> ; Nepal; Sri Lanka; Assam; Flora of Pakistan; Bangladesh; China; Myanmar; Tibet; Bhutan
Stephen C. Fry	Cell wall polysaccharides and enzymes; <i>Equisteum</i> tissue culture (callus)
Mary Gibby	Evolution and speciation in ferns; Fern conservation
Arthur V. Gilman	Lycopodiaceae; Ophioglossaceae; Systematics of temperate ferns and allies
Hit Kishore Goswami	Population cytogenetics of <i>Isoetes</i> and <i>Ophioglossum</i> ; Pteridophytes as medicinal plants
Gary K. Greer	Phenotypic plasticity; Polyploidy; Reproductive ecology; Community assembly; Antheridiogen; Allelopathy
Catharine W. Guiles	Horticulture of temperate-zone ferns, especially those of New England
Irina I. Gureyeva	Taxonomy; Morphology; Biology of ferns of Siberia and Russia, especially taxonomy of <i>Pteridium</i> and morphology of fern spores

Christopher H. Haufler	Patterns and processes of fern evolution; Application of chromosomal, isozymic, and DNA data bases in characterizing fern species; Understanding speciation mechanisms and phylogenetic relationships; The significance of polyploidy in pteridophyte evolution
Andreas Hemp	Vegetation ecology
Elisabeth A. Hooper	Fern systematics; <i>Aleuritopteris</i>
Karsten Horn	Biosystematics, ecology, population biology and distribution of <i>Diphasiastrum</i> and <i>Botrychium</i> species in Europe; Bibliography of Macaronesian pteridophytes; Conservation strategies for endangered German pteridophytes; Monograph of the genus <i>Diphasiastrum</i>
Peter H. Hovenkamp	Polypodiaceae; Nephrolepidaceae; Oleandraceae; Woodsiaceae; Saccolomataceae; Ferns of Sulawesi; Flora Malesiana; Flora of China
Layne Huiet	Systematics of <i>Adiantum</i>
Ana M. Ibars	Conservation; Fern spore bank; Germination
Ryoko Imaichi	Shoot apex structure; Evolutionary morphology; Origin of leaves
Filippo Imperato	Chemistry of flavonoids and other phenolics of ferns
Kunio Iwatsuki	Flora of East and Southeast Asia; Hymenophyllaceae; Conservation
Mirkka Jones	Determinants of plant community composition and diversity; Ecology of neotropical ferns
Masahiro Kato	Tropical fern flora; Morphological evolution of vascular plants; Speciation and adaptation of rheophytes; Evolution of apogamous ferns
Michael Kessler	Biodiversity and biogeography of Bolivian montane forests, including pteridophytes; Flora of Bolivian pteridophytes
S.P. Khullar	Fern floristics; Taxonomy; Cytology and morphology
J.H.A. van Konijnenburg-van Cittert	Evolution of fossil fern families, especially Dipteridaceae
Yves Krippel	Distribution of pteridophytes in Luxembourg
Rakesh Kumar	<i>Azolla/Anabaena</i> physiology
Siro Kurita	Speciation; Karyotype evolution; Systematics
Brij Lal	Inventory, conservation, and documentation of pteridophyte-associated traditional knowledge of Indian Himalayan region in particular
Marco Landi	Population ecology

Marcus Lehnert	Taxonomy, phylogeny, ecology and biogeography of pteridophytes; Special expertise in tree ferns
Iliia Leitch	Evolution of genome size and karyotypic diversity in plants
Blanca León	Taxonomy of neotropical Polypodiaceae, Andes and Peruvian ferns
Bai-Ling Lin	Development; Hormone signaling; Genomics
Stuart Lindsay	Pteridophytes of Thailand, Laos and Cambodia; Vittariaceae of Southeast Asia; Gametophyte biology/ecology; Multi-access keys
David H. Lorence	Pteridophytes of Polynesia, Micronesia, Mascarenes
Kay Lynch	Propagation and conservation of Hawaiian native ferns
P.V. Madhusoodanan	Pteridophytes and bryophytes of South India; <i>Azolla</i> species and Cyanobacteria as biofertilizers
Fernando Matos	Taxonomy, biogeography, phylogeny and evolution of <i>Elaphoglossum</i>
Sadamu Matsumoto	Cytotaxonomic study of ferns, especially <i>Cyrtomium</i> , <i>Asplenium</i> , and <i>Pteris</i> ; Pteridophyte flora of Southern Pacific Islands, Bhutan, Taiwan, and Mt. Kinabalu (Borneo)
J. Mitchell McGrath	Plant breeding; Molecular cytogenetics; Gene duplication
Klaus Mehltreter	Fern ecology; Phenology; Herbivory; Interactions with insects; Invasive species
Aniceto Mendoza Ruiz	Pteridophytes of Mexico; Taxonomy, floristics, cultivation and propagation of ferns
Jordan Metzgar	<i>Cryptogramma</i> ; Phylogenetics; Polyploidy; <i>Azolla</i> ; Osmundaceae
John Mickel	Pteridoflora of Mexico; Monographic studies of <i>Anemia</i> and <i>Elaphoglossum</i>
Vlastimil Mikolas	<i>Polypodium</i> ; <i>Asplenium trichomanes</i> agg.; <i>Dryopteris</i> ; <i>Equisetum</i> and ferns of Oceania
Futoshi Miyamoto	Sino-Japan and Himalayan areas
James D. Montgomery	<i>Dryopteris</i> in North America and Mexico; Ferns of Pennsylvania and New Jersey; Ecology of <i>Botrychium</i>
Robbin C. Moran	Taxonomy, biogeography, phylogeny and evolution of ferns and lycophytes
Renier Morejon Hernandez	Taxonomy and conservation of Cuban ferns
Radhanath Mukhopadhyay	<i>Selaginella</i> and ferns
Claudine C. Mynssen	<i>Diplazium</i> ; Brazilian flora

Narumi Nakato	Chromosomes; Polyploidy; Hybridization; Speciation
Maité Nino	Selaginellaceae; Lycopodiaceae; Polypodiaceae (incl. Grammitidaceae); Fern culture; Ecology
Benjamin Oellgaard	Systematics and biology of the Lycopodiaceae with special reference to neotropical Lycopodiaceae; Pteridophytes of the northern Andes, especially Ecuador; Biology; Taxonomy and diversity; Quantitative inventories of pteridophytes in sample plots in Ecuador
Sue Olsen	Testing ferns for hardiness and ornamental value and introducing ferns to the public
Leticia Pacheco	Systematics of <i>Diplazium</i>
Christopher Page	Biology and ecology of Pteridophyta; Biogeography: Distribution; Insular floras; Paleobotany; <i>Equisetum</i> ; Patterns, principles, processes and dynamics in pteridophyte ecosystems and their evolution
Santiago Pajaron	Reproductive biology; Population genetics; Systematics and evolution
Daniel Palmer	Hawaiian ferns
Ramakant Pandey	Phytochemistry of ferns with medicinal properties
Barbara Parris	Monographic studies of Grammitidaceae; Systematics, ecology and phytogeography of Old World pteridophytes particularly in tropical and south temperate regions
Alison Paul	Pteridophyte curation; Macaronesian and European pteridophytes
James H. Peck	Pteridophyte flora of Arkansas
Ana L. Pereira	Plant-cyanobacteria symbioses; Phylogeny; Cyanotoxins; Proteomics, phytoremediation, ecotoxicology of plants by cyanotoxins
Krzysztof Piątek	Fern biogeography
Jefferson Prado	Phylogeny, nomenclature, taxonomy, and geographical distributions of Pteridaceae; Pteridoflora in Brazil
Kathleen Pryer	Phylogenetics of ferns and basal tracheophytes using morphological and molecular data; Systematics of basal fern families, especially Marsileaceae, Hymenophyllaceae, tree ferns, pteroid ferns, ontogeny and phylogeny; Morphometrics
N. Punetha	Morphology, taxonomy and biodiversity of Central Himalayan ferns and lycophytes
Anshita Raj	Phytoremediation; Arsenic; <i>Pteris vittata</i> gametophytes
R.G.H. Ranil	Tree ferns

K.P. Rajesh	Ecology, taxonomy and conservation of bryophytes and pteridophytes of Western Ghats
Tom A. Ranker	Systematics, ecology and evolution of tropical ferns
Karen Renzaglia	Morphology; Development; Reproduction; Ultrastructure
Roderick Robinson	Invasive species; <i>Pteridium</i> ; <i>Lygodium</i> ; <i>Azolla</i>
Gar W. Rothwell	Phylogeny of land plants
Kai Runk	Comparative biology and ecology of Estonian <i>Dryopteris</i> ; Cultivation of hardy ferns in Estonia, especially <i>Polystichum</i> and <i>Phyllitis scolopendrium</i> and their cultivars; Hardy East Asian fern species
Arthur E. Salgado	Taxonomy of Southeast Asian ferns; <i>Asplenium</i> in the Philippines
Annette Schoelch	Construction morphology; Development of the sporophyll, sporangia, and sori in ferns; Evolution and phylogeny of ferns
Eric Schuettpehl	Evolution, diversification and systematics of leptosporangiate ferns
David Schwartz	Cheilanthoid ferns
Kakali Sen	Cheilanthoid ferns
Wen Shao	Fern embryology; Pteridophyte taxonomy; Polypodiaceae; <i>Phymatopteris</i>
B.D. Sharma	Morphology, anatomy, phytochemistry and experimental studies on pteridophytes; Paleobotany of Mesozoic and tertiary plants
O.P. Sharma	Agronomy; Carcinogenic ferns
Joanne M. Sharpe	Tropical and temperate fern life histories; Long-term studies of demography of tropical pteridophytes; Ecology of rheophytes and New England ferns
Shane W. Shaw	Systematics and evolution of Gleicheniaceae; Insect-fern interactions and <i>Isoetes</i> anatomy
Judith E. Skog	Fern evolution and phylogeny, especially basal ferns - Osmundaceae, Schizaeaceae, Matoniaceae and (with J. Mickel and R. Moran) relationships with the genus <i>Elaphoglossum</i>
Tynisha Smalls	Molecular biology of ferns
Alan R. Smith	Phylogeny of pteridophytes; Phylogeny of Polypodiaceae/Grammitidaceae; Floristics of Mexican, Venezuelan and Bolivian ferns and allies; Phytogeography of ferns
Susan V. Sprunt	<i>Polypodium</i> ; <i>Pleopeltis</i>
V.K. Sreenivas	Molecular phylogeny; Taxonomy; <i>Pteris</i>

G.K. Srivastava	<i>Isoetes</i>
Ruth A. Stockey	Paleobotany; Plant phylogeny
Michizo Sugai	Photocontrol of spore germination; Sex organ differentiation
John A. Thomson	Taxonomy, evolution and secondary metabolics of <i>Pteridium</i> ; Bracken fern/insect interactions
Alejandra Vasco	Neotropical pteridophyte taxonomy; <i>Elaphoglossum</i>
Olena V. Vasheka	Fern introduction; Cultivation of temperate-zone ferns in Ukraine; Pteridophyte conservation
Satish C. Verma	Reproductive biology, cytogenetics, genetics and cytotaxonomy of homosporous ferns
David H. Wagner	Ferns of the Pacific Northwest; <i>Polystichum</i> ; <i>Botrychium</i> ; Photomicrography
Florence S. Wagner	Cytology and hybridization in pteridophytes; Monograph of <i>Botrychium</i> ; Hawaiian pteridophyte flora; Cytology and paraphyses of Hawaiian pteridophytes; Bibliography of Hawaiian pteridophytes
Yasuyuki Watano	Speciation; Apogamy; Intragametophytic selfing
James E. Watkins, Jr.	Fern ecology; Ecophysiology; Reproductive/gametophyte biology
Richard A. White	Vascular plant anatomy and morphology; Systematics and anatomy of the tree ferns (Dicksoniaceae and Cyatheaceae) and allies
Dean P. Whittier	Morphology and development of fern gametophytes; Development of gametophytes of the Ophioglossaceae, Psilotaceae and Lycopodiaceae
Carl-Johan Widén	Phloroglucinol derivatives in ferns
Kenneth A. Wilson	Hawaiian alien ferns; Pteridophyte sporangial morphology
Michael D. Windham	Cytology and phylogeny of ferns; Cheilanthoid ferns
Paulo G. Windisch	Neotropical ferns
Paul Wolf	Molecular systematics; Population genetics; Fern phylogeny
George Yatskievych	Systematics of cheilanthoid ferns; Floristics of US (especially Missouri) and Mexico; Conservation
Reiko Yoroï	Gametophytes of Hymenophyllaceae, Vittariaceae, and <i>Asplenium unilaterale</i>
Xian-Chun Zhang	Ferns of the Himalayan region and Southeast Asia
Aurora Zlotnik	Fern anatomy; Plant stomata

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