



# International Oaks

The Journal of the International Oak Society

Proceedings  
 10th International Oak Society Conference  
 August 30 – September 2, 2022



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## **International Oaks Issue No. 34**

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**Photos, drawings.** Cover: Ryder Russell (*Quercus hypoleuroides*); David More (*Q. ajoensis*, *Q. graciliformis*, *Q. gravesii*, *Q. palmeri*, *Q. rugosa*). Page 8: Valérie de Brem. Page 9: Dirk Benoit. Page 10: Guy Sternberg. Page 11: Roderick Cameron. Page 13: Amy Byrne.

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The subject of Min Deng's oral presentation on the sexual reproduction processes in oaks was published in *International Oaks*, Issue No. 33, pp. 63-72.

Papers of the following oral presentations were not submitted for these Proceedings:

1. An Introduction to the Chihuahuan Desert and Its Oak Diversity by Adam Black and Michael Eason;
2. Species Diversity and Conservation Plan for Oaks in Laos by Phetlasy Souladeth;
3. Patterns of Adaptive and Neutral Genetic Population Structure in Two Hybridizing Californian White Oaks (*Quercus* sect. *Quercus*) by Scott O'Donnell;
4. US Navy's 20-year *Quercus tomentella* Restoration Program on San Clemente Island by Julie Lambert;
5. Taking to the Streets: Program and Technique to Bring Periodic and Summer Drought Native and Adapted Oaks into Standard Use by Sean Hogan;
6. Quantifying Exposure to Introgressive Hybridization and Its Potential Conservation Consequences: the Oak Syngameon as a Case Study by Chuck Cannon.



# Around the World in So Many Oaks

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## INTRODUCTION

Long overdue, for reasons that could not possibly have escaped anyone's attention, the much-awaited 10<sup>th</sup> International Oak Society Conference in Las Cruces, New Mexico, opened its doors to a little over one hundred participants at the end of August 2022 in the sunny Southwestern United States.

My first three or four oak expeditions to that part of the world (Arizona, Southern California, and Texas), in addition to introducing me to the inimitable, breathtaking beauty of the Southwest, were critical to my understanding of oak generic diversity and specific variability. I would say, even, they were a slap-in-the-face realization of this diversity and variability, as well as an introduction to the mental havoc that sometimes must be faced when trying to identify a member of the genus *Quercus* while wading through a non-negligible number of nomenclatural issues.

As you will read in the vivid accounts of one of the two Pre-Conference Tours (Thomas in West Texas) and of the Post-Conference Tour (Patel in Arizona) – the authors express similar experiences. Bewildering beauty, no prose can convey the beauty and grandeur, magnificent views, stunning vistas, dramatic sunsets, awesome landforms, epic views... The superlatives used in these texts to describe the places explored are, justifiably, almost as abundant as the plants. Admittedly, specifying the former is considerably less problematical than identifying the latter. *Quercus carmenensis*? To be or not to be *Q. emoryi*? A hybrid between *Q. laceyi* and *Q. stellata*? *Q. rugosa*? A *Q. toumeyii* hybrid with...? *Q. gambelii* hybridized with *Q. turbinella*? Here we are again in the wild and wacky world of oaks!

Sternberg writes in his report on the Pre-Conference Tour in New Mexico of many reunions with old friends, both plants and places, and closes with a charming bit of oak history: the Tour participants had the honor of visiting with the *Q. emoryi* that appears in Miller and Lamb's (1985) *Oaks of North America* (p. 256). On the back cover of



**Photo 1/ *Quercus championii* in the low-altitude montane forest of southeastern Taiwan, an area in need of conservation.**

that book, naturalist and anthropologist Vinson Brown is quoted as having written, "... and, some people just love oaks!" And indeed, from the Manzano Mountain Range to the Mangas Mountains and across the Catwalk National Recreation Trail in the Gila Mountains to the top of Pinos Altos Mountain, Tour participants (all of the kind Brown was referring to, I am sure) had the opportunity to see many interesting specimens of the genus *Quercus*...along with a great number of other species.

Coombes and Lamant publish here a new name which has been in the pipeline for some time: *Quercus* ×*sternbergii* – the etymology of which, I think, needs no explanation for the readers of this Journal (or even for those having read only the previous paragraph). Russell and Jablonski, true to their mission as the oak Registrars of the International Cultivar Registration Authority, describe herein a selection of new and lesser-known cultivars from the United States, Europe, and Japan. Still on the subject of names, Cameron, using various examples, describes why and how oak names change (or not), and why, though sometimes frustrating, we must accept this. He also brings us the good news that we may not have to adopt the name *Q. conferta* for the plant we know as *Q. frainetto* (but we won't know for sure until 2024).

Those attending the Conference who could not participate in the Pre- or Post-Conference Tours were nevertheless taken on a worldwide tour via the presentations that spanned widely different areas of the globe. A roundtrip ticket to China and then Taiwan, on to England, Israel, and Portugal, then to Mexico and Central America, and back in the United States.

From China, Jin et al., reporting on climatic niche evolution of section *Cyclobalanopsis*, contribute to our understanding of how past geological and climatic events have shaped extant patterns of diversity – specifically, how and when evergreen broadleaf forests developed in the Subtropical Zone.

Chen et al. provide an account of their work in determining Fagaceae diversity in southeastern Taiwan (26 species, of which 11 are endemic). In recent years, anthropogenic pressure, especially due to unlawful activities in forested areas in southeastern Taiwan, has, according to the authors, become a serious threat to the survival of many of the species in this Fagaceae hotspot. Their work lays the foundation for awareness of the need for conservation.



Hailing from another island, Harris provides a snapshot life-and-times portrayal of an English nurseryman, as he reflects on his passion both for oaks and for sharing it with others.

Reflecting on our relationship to the natural world, Zoran presents a few of Israel's oaks and the place he believes they occupy, or should, in our interactions with the environment.

Four thousand kilometers (as the crow flies) from that country, Carvalho describes a study on the assisted regeneration of *Q. ilex* subsp. *ballota* (*Q. rotundifolia*) in northeast Portugal. Natural recruitment and survival of this taxon is difficult largely due to degraded ecological conditions. This study shows that when "under the influence" of *Juniperus oxycedrus* the rate of establishment and survival of seedlings is significantly higher.

Rodríguez-Acosta and Coombes transport us to Central America and Mexico, describing their efforts to develop the regional branch of the Global Conservation Consortium for Oak, created in 2020. Amongst others, the goals of the Consortium include identifying oak species of greatest concern, targeting species for in-situ conservation, and contributing to the development of ex-situ conservation collections.

Krantz lands us back in the United States (California) with a wonderful story of how the all-species-considered champion oak of the United States, a *Quercus chrysolepis*, would likely have been destroyed during the Apple Fire in 2020 had it not been for a crew of twenty-seven inmates and three



Photo 2/ In-situ conservation of *Quercus insignis* in Costa Rica is one of the current projects of the regional GCCO Mexico and Central America.

wardens from the nearby Vallecito Conservation Camp. We also learn that two years after this fire – and the one that followed one month later – what were barren south-aspect chaparral slopes were already supporting a nearly 50% cover of perennial shrubs, with,



Photo 3/ *Quercus cedrosensis*, at the University of California Botanic Garden in Berkeley.

in between, a diverse mix of annual and perennial herbaceous species, including some that have not been seen or collected in nearly a century.

In California as well, Moskow, leaving no stone unturned, reports on the importance of oaks for California's amphibians, birds, mammals, reptiles, plants, crustaceans, insects, and mollusks, and the level of threat, on a federal or state level, they are facing.

Still in the Golden State, Gurnoe reports on the San Diego Botanic Garden's ex-situ conservation efforts for *Q. cedrosensis*, and Dave Muffly, in one paper, reflects on the lessons learned from forty-five years of planting oaks at Stanford University, and, in another, tells us the history of Apple Park and new oak introductions.

Just north of California, Mark Krautmann, in Oregon, also shares with us the lessons he and his wife Jolly have learned over the past near quarter of a century in restoration of *Q. garryana* savanna in the Willamette Valley, where only an estimated 3% remains of the oak savanna present when European settlers first arrived.

Moving east to Missouri, Coggeshall et al. discuss a unique approach to conservation measures for *Q. acerifolia* based on capturing genetic diversity using grafted trees. The goal is to plant, in four existing collections, clonal *Q. acerifolia* individuals that represent the four known populations, as well as creating a site where clones as well as seed-derived plants from each wild location will be planted together.



Photo 4/ *Quercus tomentella*, on Santa Cruz Island. This Endangered species has become a widely planted urban tree in California.



Photo 5/ *Quercus magnoliifolia*, one of the magnificent oaks of Mexico.

Headed still further east, as we arrive in Ohio, Ross and Pence, and Winkeljohn, expose the efforts undertaken to work around the very recalcitrant acorn that cannot be conventionally seed banked. The former focus on improving shoot-tip survival after cryopreservation while the latter focuses on improving survival of in-vitro shoot cultures by attempting to reduce different stress factors.

Crim then takes us to Upstate New York to explore the oak diversity and ecological complexity of the Albany Pine Bush, a unique ecosystem with plant communities that are normally found along coastlines.

Arriving in southern New England with Reily et al. we learn of different approaches being developed to increase the resiliency of the regional forests, 60% of which include oaks as dominant or significant species, and 68% of which are privately owned.

Hipp, accompanied by many friends, then takes us on an incredible voyage through time (specifically, three “kinds” of time: geological – what fossils tell us; biological – what genomes and ecology tell us; and historical – what past thought tells us), space, and function in a fascinating essay that summarizes current understanding of the biogeography of Mexican oaks, one of the most fabulous evolutionary success stories that can be told, and that, in turn, tells us so much about evolutionary processes in general. How (which in this case also means when) did oaks – and other plants – of the temperate biota cross vast ecological gaps like the one between East Texas and the mountains of Nuevo León in Mexico? What does the explosive radiation in Mexico that produced more than 160 species (many of which, even if only remotely related, share “...the same ways of making a living – the same functions...”) tell us about the role of ecology in evolution? Previous work had shown that oaks had moved into Mexico from the northeast, through what is now Texas to the Sierra Madre Oriental. Preliminary results of this work show three biogeographic patterns in both the Red and White Oak lineages.

On yet another astounding journey, Manos, chronicling the results of a collaborative project (Zhou et al. 2022), takes us through the continental radiations of the family Fagaceae across the Northern Hemisphere. We learn that the wind-pollinated genus *Quercus* evolved from within a clade formed by the five insect-pollinated castaneoid

genera in the family Fagaceae, diverging from them about 56 million years ago. This in turn means that wind-pollination alone cannot explain the evolutionary explosion of oak diversity that starts in the Oligocene, about 23 million years later; rather, it would have facilitated rapid radiation during the expansion of seasonal climates, which in turn explains why the highest *Quercus* species richness is found in cool-temperate areas in middle latitudes and montane areas at lower latitudes of the Americas. This study shows long introgressed genetic fragments between divergent sections, indicating that they code for important metabolic processes (i.e., are not selectively neutral). Oaks, which have been hybridizing for millions of years, also share other life-history traits with diverse and even tropical genera. All of this points to the functionally adaptive “syngameon”: a group of different taxa, the members of which (the species) frequently hybridize while retaining their distinctness.

Edward B. Poulton<sup>1</sup> coined the term “syngamos” (from the Greek *syngamein* meaning to marry together) to refer to groups that freely interbreed. In 1903, he entitled his presidential address at the Annual Meeting of the Entomological Society of London, “What is a species?” In his introductory remarks he quotes Friedrich Max Müller<sup>2</sup> who “...spoke of the necessity of examining, and as time passes, re-examining the meaning of words...a word may slowly and unobtrusively change its meaning, becoming, unless critically tested to ascertain whether it still rings true, a danger instead of an aid to clear thinking...” (Poulton 1904).

It seems to me that both Hipp and Manos, as well as other workers amply cited in these two papers, have not only re-examined but redefined what the word “species” means. Species are no longer “fixed entities” as most of us (probably) learned just a few decades ago.

In 1962, Thomas S. Kuhn, in his seminal work, *The Structure of Scientific Revolutions*, writes (p. 92), “...scientific revolutions are...those developmental episodes in which an older paradigm is replaced in whole or in part by an incompatible new one.” We are, it seems to me, in one of these episodes, and, as such, living a historical moment. Important as that is, just for what it is, it will certainly also come to bear on conservation appraisals and strategies.

I hope you will enjoy this journey – and learn from it – as much as I have!

## Acknowledgments

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**Photographers.** Title page: Béatrice Chassé (*Quercus hypoleucoides*). Photos 1, 2, 4, 5: Béatrice Chassé. Photo 3: Roderick Cameron.

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Zhou, B-F., S. Yuan, A.A. Crowl, Y-Y. Liang, Y. Shi, X.-Y. Chen, Q.-Q. An, M. Kang, P.S. Manos, and B. Wang. 2022. Phylogenomic analyses highlight innovation and introgression in the continental radiations of Fagaceae across the Northern Hemisphere. *Nature Communications* 13(1): 1320.

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1. Edward B. Poulton (1856-1943) was a British evolutionary biologist and lifelong advocate of natural selection.

2. Friedrich Max Müller (1823-1900) was a philologist and Orientalist who lived and studied in Britain most of his life.