



THE JEPSON GLOBE

VOLUME 14 NUMBER 1 A Newsletter from the *Friends of The Jepson Herbarium*

Director's Column: New Collaborations and Electronic Resources by Brent Mishler

With advances in technology, database structure, and our understanding of biodiversity, a new field, biodiversity informatics, has emerged. The Jepson Herbarium has developed some exciting new informatics resources and initiated collaborations with other institutions and organizations that share our goal of providing continual, rapid scientific evaluation and dissemination of the large amounts of new data that are being generated on California plants.

The Online Interchange

Many of our readers are likely already familiar with the *Online Interchange* (<http://ucjeps.berkeley.edu/interchange.html>), the clearing house for authoritative, up-to-date information about the California flora. There have been several recent enhancements to the site. The first is the new design of the taxon report pages. In addition to providing the latest information on identification, taxonomy, and nomenclature, the pages now have links to additional information maintained by the herbarium (i.e., distribution maps and the specimen database) and links to external resources including Cal Photos, the California Native Plant Society, and Flora of North America.

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SPECIAL FEATURE: BOTANICAL TRAVELS TO IRAN

by Barbara Ertter



Enjoying a laid-back picnic lunch above timberline with a group of congenial companions, does life get any better? Granted, the main language of conversation was Farsi, the slopes had been well-grazed by village sheep, and few things were in bloom at this elevation in October. Still, it was a treat to find blooming lamb's-ear (*Stachys byzantina*) in its native haunts, and the view over the precipitous valleys and cloud-shrouded Caspian plain was downright awesome. We had begun our transect of the north slope of the Alborz Mountains behind Ramsar that morning, passing through zones of sun-dappled alder forest with wild cyclamen, mixed scrub around imposing rock outcrops, and open grasslands with fall-blooming crocus making an appearance next to wind-swept *Juni-*

Above: Dr. Parhami and Dr. Norris collect bryophytes near Semnan.

perus communis. The bryophyte flora was so rich that the bryologists in our group were enticed from each site only by the promise of even more diversity at the next. Even one of our hired drivers got into the spirit, finding yet one more moss record for Iran right where our Nissan Patrols were parked.

This, my second trip to Iran, had been arranged by Fosiee Tahbaz, the first female professor at the University of Tehran College of Agriculture. A visiting scholar at UC-Davis at the time of the Iranian revolution two decades ago, Fosiee chose to stay in the United States, eventually finding a new professional home in the University and Jepson Herbaria (Globe vol. 9 no.1). The stories she shared of the natural beauty and floristic richness of her beloved country made me hope that I could one day have a chance to travel there myself. This dream became a reality when relations between Iran and the United States began to soften following the election of Iranian President Khatami. Fosiee's seemingly audacious bid to have a group of "distinguished botanists" invited to Iran as guests of several universities paid off, and in

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May 1999 she and I did a whirlwind tour of botanical diplomacy in northern and central Iran (Globe vol. 10 no. 3).

After this introductory trip, we began thinking of ways to repay the generosity and warm hospitality that we had been treated to. We also wanted to expand the opportunity to American colleagues who could form mutually beneficial collaborations with their Iranian counterparts. The potential for research collaborations was obvious, especially given the strong biogeographical comparisons that exist between Iran and western North America. Iran's central plateau, in the rainshadow of high mountain ranges, is comparable to the Great Basin with its interior-draining basins and isolated mountain ranges. Over 250 genera of vascular plants have native species in both areas, the winner by far being *Astragalus* (milkvetch, locoweed) with nearly one thousand species reported from Iran at last tally. The similarities also allow for successful introduction of plants from one area to the other, ranging from beneficial crop plants and horticultural novelties to some of our most pestiferous weeds. It was strange to see several representatives of the latter, including yellow starthistle (*Centaurea solstitialis*), tamarisk (*Tamarix* sp.), and cheatgrass (*Bromus tectorum*), occurring simply as minor elements

within a rich natural community.

The plan we eventually came up with, which brought us to the picnic in the mountains overlooking the Caspian Sea, was to assemble a team of qualified botanists representing a diversity of institutions around the United States and Iran, with the goal of amassing as complete a set as possible of Iranian vascular plants and bryophytes for the University Herbarium. In addition to the intrinsic value of the specimens themselves, which could be used for a variety of phylogenetic and comparative purposes, the joint expedition would provide a superb setting for fostering relationships between American and Iranian botanists. Fortunately the National Geographic Society's Committee for Research and Exploration agreed that this was a worthy goal and provided the funding needed to make the plan a reality.

Our trip in October 2002, the first of two funded by NGS grant 7286-02, was in part a trial run. As a result, the only American participants were from the University and Jepson Herbaria: Fosiee, myself, Dan Norris (Curator of Bryology), and, for the second half of the trip, Herbarium Director Brent Mishler. Fosiee had the challenging task of handling international arrangements, including all communications with Iranian institutions and scientists with whom we would be interacting.

In order to obtain our visas, we needed an invitation from our primary host institution, the College of Agriculture of the University of Tehran (Fosiee's previous home institution in Karaj, about half the distance from Tehran as Davis is from Berkeley, and with much the same institutional relationship). Even with the backing of Dean Alireza Talaii, formal approval entailed lengthy discussion and a vote by the entire faculty. Logistics within Iran were handled by herbarium curator Teimour Ramak Maassoumi, who did an absolutely outstanding job arranging a diverse itinerary, assembling field equipment, and making necessary travel arrangements. At the end of the expedition he also had responsibility for processing and identifying the vascular plant collections and shipping one set to Berkeley.

With a nervous eye on current events in the Middle East, Fosiee, Dan, and I boarded our Lufthansa flight on October 1, arriving in Tehran in the wee hours of the morning of October 3, after an eight hour layover in Frankfurt. The following day we were on our way west to Hamadan in the northern Zagros Mountains, where we stayed in the comfortable guest house of Bu Ali Sina ("Avicenna" to the Western world) University. In addition to Maassoumi (Iranians go by last names), we were accompanied by two other scientists

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Dr. Ghomani, Chancellor of the University of Bu Ali sina, Hamadan (former student of Tahbaz), and Dr. Soleimani, who met with Ertter, Norris, and Tahbaz were extremely interested in future collaborations between their University and UC Berkeley.

from the College of Agriculture: plant physiologist Hossein Lessani and plant anatomist Marzieh Mahdavian. The botanist in charge of the herbarium at Hamadan, Fazlolah Tajbakhsh, was thrilled with the opportunity to take us to nearby collecting sites around Ekbatan Dam, where we were able to locate a reasonable selection of late-season and riparian species. We were also treated to a tour of the university's natural history museum, where the paleontologists were processing some Miocene mammal fossils recently collected in northern Iran. The potential for a collaborative program with the Berkeley Natural History Museums was evident, and something we hope to pursue sometime in the future.

After visiting Ganjname Park, with its waterfalls and ubiquitous teahouses, we continued west to Kermanshah (sometimes called Bakhtaran) and Razi University. Here again we were given the red-carpet tour of research laboratories and the local herbarium, amidst the swarms of students typical of universities everywhere. A visit to Tagh-e Bostan historical site followed, where the bryologists in our group were distracted from the fantastic carvings of ancient Persian kings by an aquatic moss growing in a concrete culvert. My own attention being distracted

by a well-developed cold, I spent the afternoon resting at the Razi University guest house while the rest of the group visited an oak forest not far from the border with Iraq, accompanied by local botanist A.A. Hojat Jalali.

Our next destination was far on the opposite side of Tehran, where we took advantage of the late season to collect Chenopodiaceae at the northern edge of Dasht-e Kavir, one of Iran's great salt deserts. For this leg of the expedition Mahdavian and Lessani stayed home, with their place taken by Mahdavian's husband Mohammed Parhami, an agricultural engineer. The long drive took us through starkly beautiful scenery comparable to the Mojave Desert, with colorful sedimentary bands twisted into barren mountains. We stayed at the Semnan field station, a rustic facility reminiscent of some field stations where I had led Jepson weekend workshops, except that it was jackals, not coyotes, that provided twilight serenades! Dan, an inveterate birder, was delighted with the avian diversity, including numerous raptors and a flock of colorful bee-eaters far overhead. Evenings were spent with Parhami giving Farsi lessons to Dan and me, resulting in my great contribution to Persian literature, "Baba ba Barbara" (translation: "Papa with Barbara").

Guided by the leprechaun-like Rangebar, director of the field station, we spent most of one day making sporadic collecting stops along a tamarisk-lined salt wash, originating at an enclosed hot springs. I was intrigued to see the tamarisk, an attractive blue-green species, acting as a well-behaved member of the local community, leaving me to wonder what kept it from forming the monocultures that has made tamarisk the bane of desert waterways in the southwestern United States. I was also delighted by the sprawling *Capparis spinosa*, whose buds are used as culinary capers and whose pickled fruit I had sampled a few days earlier. All in all we found a good diversity of late-blooming species to collect, and even some mosses tucked away in rocky outcrops.

A side trip into the rugged Alborz Mountains, which divide the interior plateau from the Caspian Sea, allowed us to collect along a mountain stream above the town of Shahmirzad, popular as a tourist destination in the hot summer months. One visiting family, delighted with the presence of Americans, invited us to share their afternoon tea. Our return trip to Tehran took us through the southern slopes of the mountains, where the occasional stands of juniper made the area look just like northern Nevada. At one stop we found a special treat in the form of blooming *Dionysia*, a cushion-forming primrose half of whose species are endemic to Iran. Unfortunately we had only the merest glimpse of Mount Damavand, the nearly 19,000 foot dormant volcano whose snow-capped peak is a popular symbol of strength and beauty.

Back in Karaj, we were graciously welcomed into the home of Mahdavian, Parhami, and their four delightful children: Mehdi, Reza, Sara, and Ali. Once within the private space defined by the marble-faced outer wall of the courtyard, Fosiee and I were free to shed our *hejab* (modest) garb of scarves

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and light coats. The rooms were beautifully furnished and, of course, strewn with elegant Persian carpets. A home-cooked Iranian meal is a treat not to be passed by, with fresh fruit, yogurt, flat bread, and non-spicy mixtures of lamb or chicken, vegetables, and herbs to accompany a large platter of saffron-tinted rice. This was also the opportunity to use my laptop computer to enjoy the many photographs taken thus far with Dan's digital camera, a bonus I had not anticipated. I later sent one of my favorite pictures of Mahdavian and me to her Yahoo address, which she could access from their home computer.

Brent Mishler, who had just spent the previous month teaching a field class in Tahiti, arrived in Tehran late that night. In spite of the 24-hour transit, Brent's amazing stamina carried him through a full day at the College of Agriculture. His well-received talk, on *The Conquest of Land by Plants: Green Plant Phylogeny, Ecology, and Physiology*, generated a spirited round of questions covering a wide gamut of topics, including biodiversity, genomics, and genetically modified organisms. As during our 1999 visit, the enthusiasm displayed by students was overwhelming, with much curiosity about educational opportunities at American universities. Our brief meeting with University president Reza Faraji-Dana also went well, leading to a promising discussion on the po-



One of the many teashops found en route.

tential for system-wide collaborations between our respective universities.

With Mahdavian taking Parhami's place, we took the Firuzkuh highway up and over the Alborz Mountains to reach the relict deciduous forest on their northern flanks. En route we stopped to admire the impressive Verek railroad bridge, across from a tea-shop whose owner proudly displayed the portrait of his father sketched by Gregory Peck! We spent one full day in Golestan National Park east of Gorgan, accompanied by the courteous and helpful park supervisor Mehran Jahanshani. Our various stops included breath-taking waterfalls, wild boar rooting in the forest floor, rocky scrub in brilliant fall color, flood-scoured highways, and a rich temperate forest consisting of oaks, maple, hornbeam, and the endemic arborescent counterpart of witch-hazel, *Parrotia*. Dan and Brent were now in bryological heaven, with Maassoumi and Mahdavian quickly catching the bryological bug themselves.

From Golestan we drove west across the Caspian plain, through misty fields and innumerable towns and villages, into progressively wetter realms. At Sisangan National Park, we wandered through a forest of tree-sized box (*Buxus hyrcanica*), where moss-carpeted rocks covered the forest floor. We stayed two nights at the Kheyroud-kenar Educational and Experimental Forest field station near Noshahr, an impressive facility run by the University of Tehran College of Forestry. Also at the station was a large class of around eighty students from the College, some of who took the opportunity to ask me questions while I was busily pressing the day's haul. After asking if I was married (on behalf of our drivers, apparently!), the conversation shifted to what movies I liked. I admitted to having a fondness for evocative Iranian cinema, while the students were devotees of American action films!

Although the field station's ex-



Dr. Mishler and Dr. Massoumi at Golestan.

tensive forest (including beech, maple, oak, hornbeam, and persimmon) could easily have kept us busy for days, we tore ourselves away instead for a full-day transect up the north slope of the Alborz Mountains, as described in the opening paragraph. The open high country made me yearn to come back in July or August, when the vascular flora would be at its peak. On the plus side, I was able to collect seeds of wild roses, which might be useful for a research project on North American roses I'm also involved in. Our final day was a long drive back to Karaj through the spectacular Chalus River Gorge and up the hair-raising Hezar Cham switchbacks, interspersed with a last few collecting stops. Maassoumi and his family welcomed us into their home, which provided a much-needed base for final processing of specimens and repacking of our luggage. We had time for one last home-cooked meal, counterpointed by a "Mr. Bean" movie on the television, before heading to the airport and our long flight back to California.

Epilogue: In spite of the latest volatile developments in the Middle East, planning for future interactions with Iranian botanists has continued. Plans for the second NGS-funded expedition include botanists from the University

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of Arizona, Rancho Santa Ana Botanic Garden, and Missouri Botanical Garden, with expertise in Fabaceae, Poaceae, and Brassicaceae. Representatives of universities in Tehran (College of Science), Shiraz, Hamadan, and Orumiye have confirmed an eager willingness to serve as host institutions, whose botanists will join us in the field. The original proposed trip in May-June 2003 has now been postponed, but we are hopeful that sufficient regional stability will be regained to proceed with the planned expedition in 2004. In the meantime, we are making arrangements to reciprocate the hospitality we were given in Iran by inviting Mahdavian and Lessani to visit us in Berkeley in late summer. If all goes as planned, our Iranian friends will soon be able to experience for themselves the amazing biogeographical similarities between our two countries, and to see firsthand the collaborative research possibilities that would be so mutually beneficial, in so many ways. Inshallah!



Dr. Ertter collecting along the shores of the Caspian Sea.

Director's Column: from pg.1.

Pilot testing of multiple-entry keys

Additionally, we are pilot-testing a series of multiple-entry keys that allow users to identify a plant using structures that are present on the specimen(s) in hand, instead of having to answer a fixed series of questions (as in paper-based dichotomous keys). The Multiple-Entry Key Algorithm (MEKA) program was developed by Chris Meacham and the scientific content of the keys was provided by Tom Rosatti, Scientific Editor of the Jepson Flora Project (see: <http://ucjeps.berkeley.edu/keys/index.html>). The MEKA keys are based on treatments in *The Jepson Manual*, with modifications supported by specimens and by other published taxonomic treatments. They currently include keys to most members of the Asteraceae, from tribes to subspecies and varieties. Contingent on additional funding, MEKA keys for the remainder of the flora of California will be developed within the Jepson Flora Project, in collaboration with specialists in the groups involved.

A new horticultural database

The Herbarium has recently received a grant from the Elvenia J. Slosson Endowment Fund to support development of an innovative online database of horticultural and morphological information for ~3000 plants in *The Jepson Manual*. The database will promote the use of native plants in gardens around the State because native plant enthusiasts will be able to make personalized queries and create customized lists of plants that may grow well and suit

particular needs in their gardens. The Horticultural Database will be incorporated into the Online Interchange. We welcome information from our *Friends* that may be incorporated into this upcoming resource.

University of California Herbaria

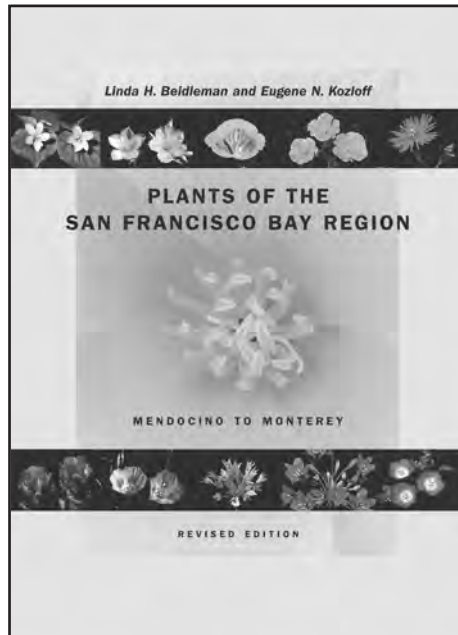
The University and Jepson Herbaria have received a generous grant from the California Digital Library to establish a coordinated network of UC herbaria. One of the goals of the project is to develop a portal system through which specimen data from California plants at all UC herbaria can be accessed through a single web page. While all UC herbaria house plants from California (and other parts of the world), each collection is unique because each one has a different emphasis. For example, UCLA emphasizes Southern California, Baja California, and the Mojave and Sonoran deserts; UC Irvine specializes in southern California and Orange County; and UC Riverside emphasizes the southwestern U.S., Mexico, and fungi of California. The new web interface will provide the botanical community with easy access to the wealth of information that is stored in UC herbaria collections.

California Natural History Online

The Berkeley Natural History Museums (BNHM) is a consortium of six museums, which together encompass some of the world's most valuable natural history and anthropology collections. A new collaboration between

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HOT OFF THE PRESS



We are pleased to announce that the New! Revised! Edition of *Plants of the San Francisco Bay Region*, Linda Beidleman and Eugene Kozloff's excellent book, is in your local bookstores at long last.

The edition is beautifully laid out, with improved keys. Graduates of our 50 Plant Families in the Field got to 'field test' the new edition this spring, and it was given rave reviews!

Available from www.ucpress.edu.
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Tarweeds and Silverswords

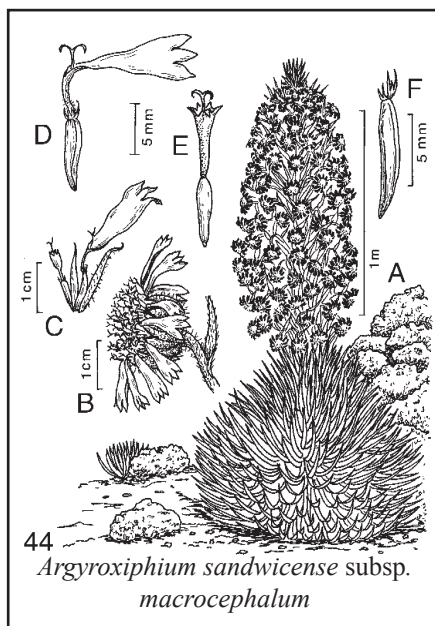
The Jepson Herbarium's own

Bruce G. Baldwin

has a new publication as well! He, along with Sherwin Carlquist, and Gerald D. Carr, edited and contributed to the new *Tarweeds & Silverswords: Evolution of the Madiinae (Asteraceae)*, from Missouri Botanical Garden Press.

From the foreword by Peter H. Raven and Victoria C. Hollowell:

"These plants first evolved to meet the diverse environments of the California Floristic Province, and later were dispersed to and colonized the islands of Hawaii, where they evolved into a spectacular group of plants. The reader will find this account approachable and fascinating: the authors and editors are definitely to be congratulated for an outstanding job of analysis and presentation."



44
Argyroxiphium sandwicense subsp.
macrocephalum



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Tarweeds & Silverswords:

Evolution of the Madiinae (Asteraceae),

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PROJECTS & RESOURCES THE JEPSON HERBARIUM

The Jepson Flora Project

Online Interchange for Advances in
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Electronic Publication of Jepson's
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Publications & Research Projects

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Director's Column, from pg. 5.

the BNHM and UC Press, *California Natural History Online*, will bring together data from more than 1.8 million specimens; over 51,000 images; and a library of historical materials, researcher field notes, and books on natural history (including the California Natural History Guides). The collaboration is intended to facilitate research and understanding of the flora, fauna, and natural features of California, and will soon expand to include other collaborators from NGOs and state agencies (details forthcoming on a later issue of *The Jepson Globe*).

The Ultimate Phylogenetic Database

Of all types of biological relationships, phylogeny provides the best general purpose classification. Only by organizing databases phylogenetically can these data be related properly, thus allowing efficient retrieval of known data, prediction of unknown traits, and greater understanding of biological processes. Several collaborators from UC Berkeley, Stanford, and Yale have

worked to develop a prototype phylogenetic database for a sample Californian plant genus (*Lessingia*) which incorporates collection, geographical, morphological, ecological, and molecular data (see: <http://ucjeps.berkeley.edu/upd/>). Examples of queries to this unified database include searching for: the clades that occur in a specified geographic region, the morphological or ecological variation in specimens distal to a chosen node, and the subset of species with a particular combination of character states. This database can be used for such seemingly disparate tasks as herbarium management, geographic inventories, systematic studies, comparative ecology, and identification of unknown plants. Pending sufficient funding, we plan to extend this database to the whole California flora, and beyond.

In future *Globe* articles, I look forward to sharing our progress with you on these and other exciting initiatives.

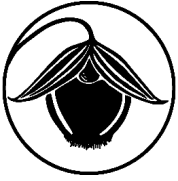
Botanical Adventures in New Zealand

Betchart Expeditions, who coordinated the Jepson Fern trip to Ecuador, is running an Expedition to New Zealand for the New England Wildflower Society, November 3-18, 2003.

The trip will be led by Ron Cometti, one of the top naturalists and artists in New Zealand. From kiwis to kakas, temperate rainforests to alpine meadows, New Zealand possesses a rich natural heritage. Nearly 93% of the alpine flora of New Zealand is endemic, and many plants have no close relatives anywhere else in the world! From Milford Sound to Waitakeres, from Paproa National Park to Christchurch, come explore the flora, fauna, and cultural heritage of this beautiful island nation!

For more information, call Betchart Expeditions at 800.252.4910 or the New England Wildflower Society:

www.newfs.org/lectures.htm



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July 2003

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July 17 - 20

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*Carex *WL*
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August 8 - 10

September 2003

Fall Bloom, Mojave
September 12 - 14

For more information or to register for a class, please contact Anneke Swinehart at the Jepson Herbarium; phone: 510. 643.7008,
email: annekes@uclink.berkeley.edu. Please visit our Web site at: <http://ucjeps.berkeley.edu/jepwkshp.html>