



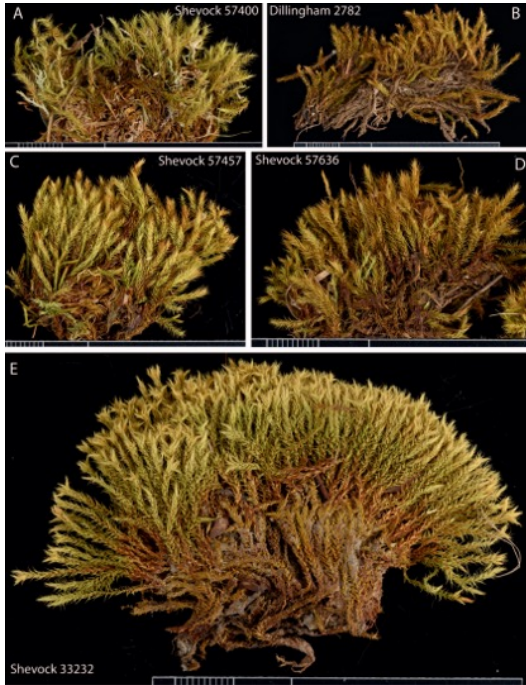
Nemophila



Editor: Brianne Palmer

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Newly Identified California Moss in Mountain Fens! By: Sonya Pendrey



[California Academy of Sciences' researchers James Shevock and Blanka Agüero have been working to categorize mosses.](#) These are plants that don't grow flowers or rely on specialized tubes to transport water and nutrients. Rather, mosses reproduce via spores and moss cells directly absorb moisture and minerals.

In 2022, the researchers documented a species of moss that is newly recognized by Western science as *Philonotis breutelioides*. *P. breutelioides* can be found in low-lying marshy wetlands fed by groundwater, called fens, in the southern Cascades, Klamath, and southern Sierra Nevada mountain ranges.

If you were to go for a hike in Plumas National Forest and come across a fen like the one above, you'd be in the right place to spot *P. breutelioides*. You'd have to keep your eyes peeled for tufts or mats of tan-brown moss with a slight red tinge about 2.3–5 cm tall, almost like a shag carpet.

Compared to other mosses in *Philonotis*, *P. breutelioides* has leaves that narrow into a pointed tip with slightly curved shoot tips, leaf bases with obvious folds, and long thin-walled cells in more numerous rows between the leaf center and edge.

Continued on page 2...

Shevock J. and Agüero B. 2023. "*Philonotis breutelioides* (Bartamiaceae), A New Montane Fen Moss Species Endemic to California" *Madrño* 69(4), 349-358, <https://doi.org/10.3120/0024-9637-69.4.349>

Letter from the President – Kathleen Kay

This fall, I am honored and excited to take the reins of the California Botanical Society as the incoming President and would like to take this space to introduce myself. I am a native Californian – 3rd generation, in fact. I grew up on the Palos Verdes Peninsula in Los Angeles County, exploring the tidepools and remnant patches of coastal sage scrub, and spent childhood vacations at my grandparents in the San Bernardino Mountains. When I started college, I hoped to be a journalist and was interested in writing about environmental issues. However, in taking science classes for “background”, I fell completely in love with evolutionary biology, genetics, and those endlessly fascinating creatures called plants. When I found out that it might be possible to make a career of that, I was hooked. It was also during my undergraduate years at UC Davis that I realized just how lucky I was to live in the biodiversity

hotspot of the California Floristic Province. I took Michael Barbour’s life-changing course on California Plant Communities, for which we traveled all over the state, and I started exploring the backcountry of the Sierra Nevada range. During my PhD work, I came to understand the groundbreaking work of the California Biosystematists, an organization (primarily of botanists) from the Carnegie Institution at Stanford, UC Berkeley, UC Davis, and the Cal Academy that took an interdisciplinary approach to study the genetics, ecology, physiology, and evolutionary history of species radiations. Many of the Biosystematists served as Presidents and Council members of the California Botanical Society and published important foundational work in Madroño. Although my dissertation at Michigan State University focused on tropical plants, this approach has guided my research career, as I have attempted to meld

phylogenetics, ecology, and evolutionary genetics to understand how plants diversify. In 2008, I joined the faculty in the Department of Ecology and Evolutionary Biology at UC Santa Cruz, and was delighted to return to my native California flora, with such extreme biodiversity in my backyard, and within driving distance to the awe-inspiring Sierras. My current research program is split between Neotropical and California plants, with California work focusing on edaphic and climate adaptation in a range of genera, including *Clarkia*, *Leptosiphon*, monkeyflowers, and more. California has a special place in the botanical world, with its biodiversity and scientific leadership. My hope is to continue this history while also making California botany accessible and equitable for the next generation. I would love to hear from members about their ideas for this society – please drop me a note!



Feature story continued...

For Shevock and Aguero, deciding where to place this species in the moss family tree was difficult because it's similar to two larger species groups: *Philonotis* and *Breutelia*. By looking at genetic information, Shevock and Aguero found a relationship between *P. breutelioides* and a previously described moss species, *P. fontana*. This allowed the researchers to place *P. breutelioides* in the *Philonotis* group. Although *P. breutelioides* has been identified, there still remains much mystery around this group of mosses and their relation to one another.

Much of California's biological diversity has been recorded, but smaller organisms like mosses are often overlooked in documentation surveys.

In the face of climate change, habitat degradation, and many other circumstances that threaten California's biodiversity, identifying and documenting moss species is important because it provides a record of life that can support conservation efforts of larger ecosystems. Specifically, fen habitats are impacted by grazing herd and pack animals. Concern for *P. breutelioides* could lead to further environmental protections or different management decisions in the areas this moss has been documented.

Volunteer webmaster needed! We are looking for someone with WordPress expertise to help troubleshoot and maintain the new CalBotSoc website. Send inquiries to Vice President Josh Der (jder@fullerton.edu).

Upcoming Events

Speaker Series (7 pm):

- **December 14:** Candela Blanco Moreno (Universidad Autónoma de Madrid, Spain & Cal Poly Humboldt)
- **January 11:** Steve Matson (CNPS)
- **February 8:** Susan Fawcett (University and Jepson Herbaria, UC Berkeley)

Annetta Carter Memorial Fund Grants
Next deadline: **December 31, 2023**

Paul Silva Grant Awards

David Mitchell (University of California, Davis) : Soil management to improve native tree and shrub restoration and enhance mycorrhizal symbioses in rangeland riparian zones

Josue Magaña (California State University, Fresno): Investigating the relationship between Galápagos Island and North American *Amaranthus* species with a focus on *Amaranthus torreyi*

Chi Wei (Old Dominion University, Norfolk, VA): Using Aerial Vegetation Indices to Enhance Acorn Crop Estimates in Analyses of California Oak Phenology Patterns

Ioana Anghel, UCLA

November 9th at 7 pm

Evolutionary relationships and phenotypic patterns in *Linanthus*



The genus *Linanthus* (*Polemoniaceae*) is an ideal system to study species diversification in heterogeneous arid environments. Nineteen out of 25 species overlap in geographic range, and seven species pairs

co-flower and co-occur at a locally sympatric scale. Reproducing in a span of a few weeks in the spring, these co-occurring species must have strong reproductive isolation mechanisms to maintain their genetic and phenotypic integrity. Their high diversity of flower shape, color, and scent likely attract different pollinators and facilitate the ecological differentiation of species. I present the first *Linanthus* phylogeny with complete species sampling and broad sampling within species, using two types of genomic data. I examine the phylogenetic status of species, reconstruct the relationships between species, and investigate patterns of evolution of floral and life history traits. This analysis provides a foundation to understand adaptations to arid landscapes, such as evolution of flower color polymorphisms, night blooming and annuality, in *Linanthus* and in other desert genera.

Join via the [Zoom link](#)