

New England Botanical Club – Minutes of the 938th Meeting

1 May 1998 Prepared by Dr. Paul Somers, Recording Secretary

The 711th meeting of the New England Botanical Club, Inc., being the 938th since the original organization, met on Friday May 1, 1998 at the Phillips Auditorium, Spaulding Hall, University of New Hampshire with 51 members and guests present.

Lisa Standley introduced the evening's speaker, Dr. Garrett Crow from the University of New Hampshire, stating that he was a leading authority on the genus *Sagina* (Caryophyllaceae) and coauthor with Barre Hellquist of a soon to be published manual, **Aquatic and Wetland Plants of Northeastern North America**. A member of NEBC since 1975, he has held many club positions and encouraged what may be a record number of former students who are now club members-and has the dubious distinction of holding the Club record for most slides shown in a single NEBC lecture (560 slides/4 trays).

Garrett's topic for the evening was "Biodiversity of Aquatic Plants in Costa Rica and Bolivia: Is New England Really the Amazonia of Aquatic Diversity?" Utilizing floristic data from his aquatic plant research in Costa Rica, which began in 1984 with a sabbatical at the Universidad Nacional de Costa Rica, and recent trips to Bolivia to assist doctoral student, Nur Ritter, Garrett attempted to convince us that northern temperate aquatic ecosystems in formerly glaciated New England and Michigan were often equal to or more species rich than those of comparable size and general ecological character at his tropical sites. This, of course, is contrary to the general pattern where vascular plant floras in tropical areas are dramatically larger than their temperate counterparts of comparable size. Demonstrating this general trend, he stated that Costa Rica has a very rich flora comprised of 10-12,000 vascular plant species, whereas the Carolinas, which are over four times larger, have only 3360 species. His inventories of wetlands in Costa Rica and Bolivia often showed the opposite pattern, fewer or comparable numbers to those found at New England sites studied by himself and others.

To better understand this apparent reversal of the normal phenomenon, he looked at the problem from two approaches: 1) by comparing species richness latitudinally on a similar habitat basis, and 2) by comparing richness in various taxonomic groups among regional aquatic plant floras. Many examples of the habitat basis comparisons were given. The individual floras of two ponds in Puntarenas, C.R. were comparable in number, about 20 species, to that of Turtle Pond in Lee, N.H., but the flora of Costa Rica's Lago Hule was only 25 species compared with the 125 species reported by Hellquist for New Hampshire's Lake Ossipee. Also, peatlands of New Hampshire and Michigan, when compared to paramo and sphagnum bogs of Costa Rica's Cordillera de Talamanca, came up much higher in species' numbers. In defense of the paramos, however, he noted such interesting species as *Puja dasyliroides*, a spectacular bromeliad, and *Drimys granadensis* in the Winteraceae, a primitive angiosperm family. Applying his second approach, he compared numbers of species in aquatic plant families in three regions: northeastern North America, southeastern United States, and Central America. The total number of species (145) was slightly higher in the northeastern U.S. than in the southeastern U.S. (122 spp.) or Central America (120 spp.). Comparing individual families across the three regions, he showed that certain families, e.g., Eriocaulaceae and Mayacaceae, had the most taxa in Central America, but

many other groups, such as the Cyperaceae and Haloragaceae were highest in the northeastern U.S. and poorly represented in Central America. Garrett's field work in Palo Verde National Park and Rio Tempisque yielded 14 species new to Guanacaste Province and two, *Polygonum hispidum* and *Bergia capensis*, that were new to Costa Rica.

Garrett then took us south to Bolivia where he and Nur Ritter have been further examining aquatic plant diversity. Bolivia he said is approximately two times the size of Central America. It is much less explored than Central America botanically (1/10th the number of collections), but is estimated to have a flora of 18,000 vascular plant species. Starting in the Cochabamba Valley, Garrett and Nur's base of operations, we were introduced to human diversity featuring Quechuas, the predominant Indian people of Bolivian highlands, and the diversity of the local edibles, e.g., amaranth, oca tubers (Oxalidaceae), and many kinds of potatoes. Garrett even credited Bolivia for the origin of mashed and freeze-dried potatoes. After adapting to the elevation with the aid of coca leaves (and later the rough recycled toilet paper that's primary function is the straining of mashed coca leaves), our northern botanists headed off to explore wetlands ranging from a sphagnum bog at 2920 meters elevation with 21 species to some tropical lowland sites in the upper Amazon Basin where some of the highest species counts (65-84 species) were obtained. A high point of the trip was visiting La Meseta, a tableland savanna habitat with many endemics located near the Brazilian border and the inspiration for Conan Doyle's Lost World. The Lentibularaceae was well represented here with one species, *Genlisea guianensis*, being new to Bolivia. While many interesting and beautiful species were observed here and elsewhere in Bolivia, once again, though, the species richness was generally equal to or less than in the northeastern U.S.

It is Garrett's hope that his investigations will help conservationists set priorities regarding protection of wetland habitats. In Costa Rica's Palo Verde/Rio Tempisque, for instance, where 97 species occur, this should be valued as an area of high tropical diversity, even though lower than that found in many temperate swamplands. He also hopes that these studies will further the recognition of northern temperate wetlands of New England as the "Amazonia" of aquatic diversity. When asked afterwards, why he thought diversity was higher in the northeastern U.S., he speculated that there appears to be a relationship between high diversity and areas of the northeast rich in aquatic habitats as a result of Pleistocene glaciation. As support for this he noted the relatively low diversity in wetlands explored in unglaciated areas of southcentral Siberia.

The group then adjourned to the Herbarium for conversation and refreshments, including delectable mycological ones provided by Therese Thompson.