March, 2000

NYFA Newsletter

New York Flora Association
of the New York State Museum Associates

Richard S. Mitchell, Editor, New York State Museum
Correspondence to NYFA, 3140 CEC, Albany, NY 12230
email: rmitche3@cecdom.sedosn Join $10 Issues $10

Vol. 11 No. 1

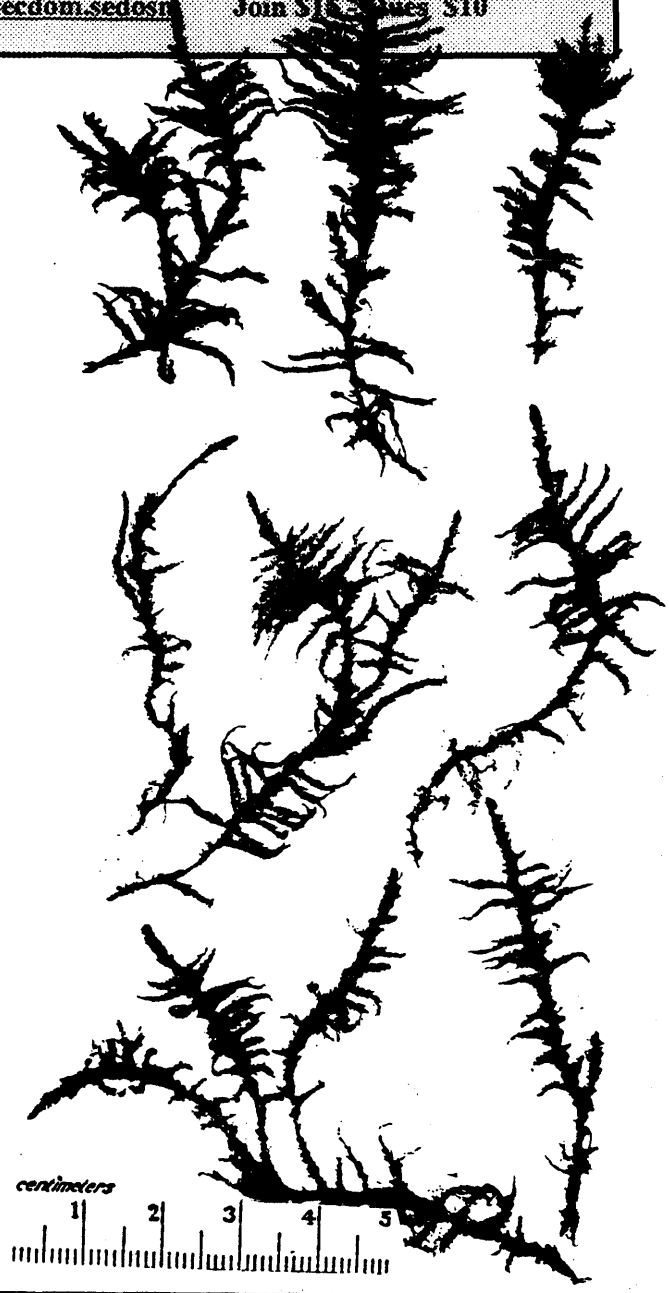
Pseudoscleropodium purum, a European Moss Widely Naturalized in New York State - by Norton Miller

Increasing numbers of bryophyte species are being recognized as adventive or naturalized in various local floras throughout the world. However, only a few of these plants can be considered invasive, at least in the sense in which the word has been applied to the behavior of widely publicized examples of aggressively-spreading seed plants. The moss, *Pseudoscleropodium purum* (Hedw.) Fleischer *in* Broth., may be an exception.

The precise original range of this feather moss has not been ascertained, but it appears to be native from central Europe, northwestward and westward to southern Fennoscandia and Britain and Ireland. There is general agreement that its occurrences on certain islands (Hawaii, Sri Lanka, Réunion, St. Helena, Tristan da Cunha, Azores), in North America, and in the Southern Hemisphere (Chile, New Zealand) are the results of inadvertent introductions, most likely from plants employed as packing for china and nursery stock shipped from Europe or elsewhere.

In North America, *Pseudoscleropodium purum* has become a common lawn moss in southwestern British Columbia and nearby parts of Washington State. It has been observed in Saint John's, Newfoundland, in a park lawn, and in Ann Arbor, Michigan, in a field adjacent to an arboretum. These stations are consistent with the weedy status of the species in North America.

To this scattering of places in North America can now be added 22 occurrences in western, central, and eastern New York (Erie, Cayuga, Cortland, Broome, Tioga, Albany, and Rensselaer counties). Norman Trigoboff found it first in New York State in 1996 in the City of Cortland where it grows in lawns at the City Water Works, City Water Tower, and the Cortland Rural Cemetery. Mr. Trigoboff and I have



The moss, *Pseudoscleropodium purum*, a European pleurocarp now recognized as a naturalized member of the New York flora

since observed it in cemetery lawns elsewhere in Cortland County and in other nearby counties.

A search by me of 69 cemeteries in Rensselear County, in eastern New York, showed that it is well-established in 13 of them. These discoveries, all in the past few years, indicate that *Pseudoscleropodium purum* is widespread in New York State and perhaps elsewhere in the Northeast.

It is not difficult to learn to identify this moss. It is a robust, irregularly pinnate pleurocarp (see the preceding illustration of plants at full size). When moist, the stems and branches are turgid, and when either wet or dry a short abrupt cusp at the apex of the ovate and convex stem and branch leaves is diagnostic. Sometimes, plants of *Pleurozium schreberi* are similar, but they have non-cuspidate leaves and the stems are red (vs. green in *P. purum*). Well-developed plants of *Bryoandersonia illecebra* can also be confused with those of *P. purum*, although they are less clearly pinnate and the leaves are conspicuously serrate (vs. entire or only weakly serrate near the leaf apex in *P. purum*). A single strong costa can be seen under handlens magnification in leaves of *Pseudoscleropodium* and *Bryoandersonia*; the costa is short and double in *Pleurozium*.

Nearly all the places where we have found *Pseudoscleropodium purum* so far are mowed cemetery lawns. We are in the process of gathering more data about specific edaphic or other environmental conditions that correlate with its presence. Two factors seem important in New York State: shade provided by *Picea abies* or *Thuja occidentalis* (usually three or more large trees) and damp clayey soil. We have not found it in cemeteries with sandy soil or those without trees or only deciduous ones. Nor have we found this moss in pure *Picea abies* plantations or in parks and village commons with lawns and mature examples of this tree. *Pseudoscleropodium purum* has separate male and female plants. While no one seems to have identified male populations of it in North America (plants in St. John's, Newfoundland are, however, female), some populations in New York are male and others are female. Plants of both sexes have not yet been found growing together at a single site in New York State (or in fact elsewhere in North America), so sporophytes are not produced in any of the populations that we (or others) have studied.

Unisexual populations appear to be a characteristic of recently invading dioicous mosses. Over time, dispersal should bring male and female plants together, but the requirements and mechanisms of this process are poorly understood.

I encourage botanists to join me in exploring for more stations of *Pseuodscleropodium purum* in New York and neighboring states. Ron Gill, of the New York State Biodiversity Research Institute, and I have developed a web site at **www.nysm.nysed.gov/bio/ppurum.index.html**, that gives additional information about where *Pseudoscleropodium purum* occurs in New York, including dot maps that can be clicked on to reveal precise locality data. We plan to add new stations to the maps as they are discovered. By increasing the number of people searching for this moss, a better picture will result of where in it grows, thereby allowing more objective assessments of its spread. Instructions on how to participate are found on the web site. If you would like to be sent a sample of this moss to help you in your search, please contact me at nmiller2@mail.nysed.gov or Lori Leonardi (lleonar2@mail.nysed.gov) at the New York State Museum.

Literature Cited:

Allen, B. H., & M. R. Crosby. 1987. *Pseudoscleropodium purum* re-established in South America. Jour. of Bryology 14: 523-525.

Brassard, G. 1983. *Pseudoscleropodium purum* in Newfoundland, Canada. Journal of Bryology 12: 618, 619.

Lawton, E. 1960. *Pseudoscleropodium purum* in the Pacific Northwest. Bryologist 63: 235-237.

Lewinsky, J., & J. Bartlett. 1982 *Pseuodoscleropodium purum* (Hedw.) Fleisch. in New Zealand. Lindbergia: 177-180.

Rohrer, J. R., & H. E. Kirkpatrick. 1985. *Pseudoscleropodium* discovered in the Great Lakes region. Bryologist 88: 24, 25.

Letters to the Editor:

Dear Dick:

This letter is written in response to your provocative article "Are Invasive Plants Really a

Serious Danger to Native Plants and Communities" that appeared in the July 1999 issue of the NYFA Newsletter. We have the benefit at this time of six months of subsequent discussion and additional qualifying comments on your part. This letter is not an attempt to address point by point many of the issues that you raised, since most of these have been discussed in some form by letters you have printed. Rather, this letter is a reiteration of the goals and perspective of the Invasive Plant Council of New York, with a few thoughts of what some of us have learned from the NYFA discussion. The Invasive Plant Council of New York was incorporated in July 1999 as an outgrowth of a five-year series of meetings held at various New York locations to discuss the impact of invasive plants within the state, and to build consensus on ways that we might address what we see as a threat to native species and natural areas. The mission of the new organization is to provide a forum for discussion of invasive species issues, assemble the best information available for broad scale distribution to decision makers and land managers, and, when possible, to collect data. From all indications so far, this is a big task and one that is not covered by any other organization in the state. Over 300 people have attended these meetings, most expressing enthusiastic support for our work. We now have a mailing list that reflects a broad range of land managers, environmentalists, educators, and members of the nursery, landscaping and gardening trades.

Invasive plants do appear to be a hot topic, as you noted. Hot and controversial and rife with misinformation and misunderstandings, as well as huge gaps in our knowledge base. The Invasive Plants Council is attempting to increase understanding of the range of topics associated with invasive plants, while attempting to remain objective and open minded to a broad range of perspectives. We are well aware of some of the pitfalls of the topic. Your articles touched on many of them that are very familiar. It is possible to be accused of what amounts to plant racism when dealing with invasive plants. One of our board members was once called a plant fascist at a landscapers' conference. His perspective was summarized by a subsequent speaker as "Certain species apparently don't have a right to exist here." That, of course, wasn't the intention at all. We won't eliminate perhaps any of these species from sites that we value, nor is it perhaps even necessary to take that posture. Rather, if we choose our battles by species and specific site, we may be able to maintain and enhance some sites of native species and natural areas that we care about most.

Change is natural as you note. Species do move around. In the short time we have looked at the New York flora, there have been detectable expansions of several species. Certainly this appears to be true based on comparisons of historical records to modern occurrences. *Corydalis flavula, Cunila organoides, Carex bushii, Agrimonia parviflora*, and *Mimulus alatus*, to name only a few, are all found farther north and in greater abundance than they were in the 1920's. There are numerous other species that seem to be in new places in the state. But more often, there is documentation of species lost from the state or in much reduced numbers. We agree that we do see rare plants co-occurring with species we think of as invasive, but we also repeatedly see a diminished flora where once our collective records documented great botanical richness. And yes, these occurrences of invasives are often and perhaps always associated with human-derived disturbance. There are but few locations in New York that have not been severely impacted by human activities. It is sometimes amazing, when we can think in those big time frames, that we have anything resembling a native flora left intact given the severity of past deforestation, wetland conversion, and just simple so-called "improvements" on the land. But much of our original flora does persist and is subject to further losses by an amazing range of new threats, including the continuing expansion of invasive plants.

Our databases are admittedly weak. We have only the hindsight that we should have monitored the changing floristic scene and altered processes. The acute interest that has developed today in rare species and natural areas is very young. It is no wonder that we have few good studies to document what seems so self-evident to some of us. Also, it has been tempting to paint invasive species as all bad, devoid of natural area values. Clearly, this is not the case and for some of us we have had to admit that many native species (to date mostly the animals have been documented) are not seeking native species-based communities, but are more generally seeking structural communities in which to live. Those are the "lucky" species, the ones that can adjust their habitat usage to changing environments. In fact, some of our rarest native

plants are now found principally in disturbed habitats.

It is interesting, for some of these species, to discuss whether they ever occurred in natural New York habitats undisturbed by people. There are also the truly "unlucky" plants in New York that no longer can compete at some sites now dominated by invasives. Some of these species were formerly found in fair abundance in New York. Some are now gone or are very rare in our high salt marshes, fens, alpine meadows, old growth forests, coastal salt ponds, ocean beaches, and some tidal sections of the Hudson River. We must all be better at documenting what we as naturalists and ecologists see.

We should limit our more extreme management acts to those sites and situations where good data can be reflected in our decisions. We must advocate for those studies of sufficient detail and duration that can answer the hard questions that today may only be answered with an inadequate emotional response.

It is hard, as a conservation land manager, to sit back and accept change when it seems that our purposeful actions might bring about ways to mitigate what we see as undesirable outcomes. The homogenization of the high marsh community along our coast to *Phragmites* and the proliferating masses of loosestrife are dismaying to many who value natural diversity. Your words of caution concerning our goals are well worth hearing, but should not make us complacent to undesirable change that can be addressed with purposeful work.

We can be accused of being at times nostalgic in our reactions, wishing for those early New York days before nutrient runoff, ATV's, and suburban sprawl. There is a place in conservation for native plant gardens and recreated natural systems. For some few species this is the best hope that they have to survive at all. These gardens are a natural outgrowth of modern effective work in botanical gardens and are a powerful teaching tool. We need more of these in New York. The emerging field of restoration ecology is an exciting and hopeful addition to our perspective on conservation. We are collectively very new at this. There is an active subsection of academic ecologists researching natural area processes at a broad range of scales in relation to invasive species. Many are focused on the emerging issue of what makes some natural communities highly susceptible to invasions, while others seem to resist invasion. Active research is conducted on system processes including fire, hydrology and soil chemistry. Conservation topics such as reforestation, natural area buffers, fragmentation, and innumerable other topics are also being studied that will improve our ability to understand how natural areas function.

Simultaneously, there are applied studies focused on the effect of biocontrol, fire, mowing, soil modification, and a range of combined management. In many ways, we are still gardening when we actively manage natural areas, but we are working toward a time when we can better reach conservation goals, understanding the implications of our management on more subtle community features than just vegetation composition and structure.

Like the larger environmental movement in general, of which the IPC has a small part, and for the broader scientific community, those of us working to solve invasive species environmental problems are very diverse in our perspectives and approaches. We do not speak with one voice by any means. There are those of us who would like to see some species outlawed and regulations in place to prohibit the use of a range of species. Some among us are passionately opposed to herbicides or the use of biocontrol agents. Others are equally advocates for the broadest range of management tools. Still others want many more studies before we act. There is a role for all of these players in this work and room for healthy discussion with many voices both loud and soft.

The Invasive Plant Council of New York is poised to facilitate the discussion of these stimulating and difficult questions. We look toward a time when fewer ongoing human disturbances will continue to degrade our limited remaining natural areas. Where possible, we hope to encourage the reestablishment of those natural processes that have been altered and have impacted native plant populations. We encourage all forms of discussion on this topic and hope that reactions to this, at times, emotional issue will not limit advances in our management technology and will increase our appreciation for our fragile botanical resources in New York. Sincerely yours,

The Board of Directors of The Invasive Plants Council of New York

Check your mailing envelope, just above your name, to find out the last year you paid dues. Thanks.

New York Natural History Conference VI.

April 26 - 29, 2000

The New York Natural History Conference is a forum for researchers to present current information on natural history in New York State and northeastern North America and for identifying critical research needs. Furthermore, it fosters friendships and rekindles interests in natural history by bringing together researchers in all related disciplines.

The program includes a conference speaker, workshops, paper sessions, poster sessions, field trips, illustrators' gallery, book market, and one dinner. All sessions will be open to contributed papers and the number of concurrent sessions will be minimized to reduce conflicts.

NYNHC VI is being organized by Biodiversity Research Institute Administrative Staff. Feel free to contact us with any questions you may have.

New York Natural History Conference VI
New York State Museum
3140 CEC, Albany, NY 12230
Phone: (518) 482-6139
Fax: (518) 486-3696
Email: bri@mail.nysed.gov

Oral Presentation Schedule

Thursday, April 27, 2000 Museum Theatre

Ecology of Invasive Plants

Moderator: George Robinson (SUNY, Albany)

8:40 **Robinson**, George R. and Richard S. **Mitchell**
Why is Over One-Third of the New York State Flora Non-Indigenous?

9:00 **Miller**, Norton G.
The European Moss Pseudoscleropodium purum *Naturalized in New York State: A Potential Meso-Scale Invasive*

9:20 **Winters**, Cris L.
Ecological Relationships Between North American Birds and Invasive Plants

9:40 **Hunter**, John C.
The Spread of Exotics into Forest Remnants in Brockport, NY

10:00 Coffee Break

10:20 **Alben**, Katherine T., Justin **George**, and Jamie V. **Woodall**
Characteristics of Dissolved Organic Carbon from Trapa natans *Wetlands*

Management of Invading Plant Species

Moderator: George Robinson (SUNY Albany)

10:40 **Blossey**, Bernd
Biological Control of Invasive Plants in Natural Areas of the Northeast

11:00 **Adams**, David J. and Bernd **Blossey**
A Proposed Draft Purple Loosestrife Management Plan For The Lower Hudson River Valley – An Opportunity for Utilizing Community Involved Watershed Management

11:20 **Spada**, Daniel M.
A Plan to Control Invasive Exotic Terrestrial Plant Species in the Adirondack Park

11:40 **Corey**, Michael E.
Controlling Japanese Knotweed, a Pesky Invasive Plant

12:00 Lunch Break

1:10 Poster Session

2:30 Coffee Break

Botany

Moderator: Troy Weldy (New York Natural Heritage Program)

2:50 **Weldy**, Troy
An Overview of the Rare Plants of the Hudson Valley

3:10 **Goldman**, Douglas H.
Post-Glacial Gene Flow in Calopogon tuberosus *(Orchidaceae)*

3:30 **Sheviak**, Charles
A Reappraisal of the Northeastern Members of the Platanthera hyperborea *complex (Orchidaceae)*

3:50 **Tessier**, Jack
Springtime Photosythesis and Nutrient Translocation in Dryopteris intermedia

4:10 **Dirig**, Robert
A Gallery of Familiar and Interesting New York State Lichens

NYFA Reorganization Meeting,
April 27, 2000, 4:30-5:30,
Museum Theatre, New York State Museum.
Join us for a discussion of the future of the of the New York Flora Association and a planning session for upcoming activities and possible publications. Your involvement is needed to help elect of new officers, redefine the activities of the association, discuss an update of the Flora Atlas, and decide the best uses of our funds. Come and be a part of what should be a lively discussion.

Potential New NYFA Projects

Some of us within NYFA would like to redesign the "Vouchered Atlas of the New York State Flora" to a digital format (probably ArcView or MapInfo). Once complete, the updated Atlas would be posted to the world wide web, with a bulletin board for addition and subtraction of data, and the listing of new plant discoveries. This atlas would also receive periodic updates. Initially, the electronic atlas will be limited to county distribution maps, but it could be expanded later. We are still in the very early planning stages and looking for assistance. NYFA is also looking for some willing volunteers to possibly develop a label-making program for use by all plant collectors across the state. Richard Mitchell has produced a "Database of New York State Plants" in Microsoft Access. Ideally, we would like to see a label program that would tie into the electronic checklist and database, and automatically complete some fields (*i.e.* author fields, wetland codes, etc.). This would also help unify the nomenclature on herbarium labels, end spelling errors, and tie into a new flora atlas. Anybody who is interested, or who has comments about either the label program or atlas project should contact Troy Weldy of the NY Natural Heritage Program:
e-mail: twweldy@gw.dec.state.ny.us
phone: 518-783-3926