

G. MULTI-STATE RESEARCH

In 1977, Norman H. Dill and Arthur O. Tucker established a herbarium at Delaware State University (then College). In 1980, the University of Delaware's Department of Plant Science formally transferred the herbarium of the Society of Natural History of Delaware to Delaware State University. On June 12, 1982, the Delaware State University herbarium was formally dedicated to Claude E. Phillips (1900-1981). Claude was the most active and best known field botanist on the Delmarva Peninsula for much of the latter half of the twentieth century. He authored 8 books on plant identification and conservation, including *Wildflowers of Delaware and the Eastern Shore* (1978).

In 1996-1997, Kenneth Bell, Dean of the School of Agriculture and Related Sciences of Delaware State University, and William DeLauder, President of DSU, obtained funding from the U.S.D.A. and the Longwood Foundation to construct a new herbarium building and equip it with many new cabinets. The new herbarium was dedicated on May 11, 2000. On May 13, 2000, a formal symposium was held with speakers, musical presentations, gourmet herb luncheon, and exhibits. With its bright, pleasing, and inviting interior, the new herbarium building successfully achieves budgetary, aesthetic, and utilitarian balance. It is a place where both the public and research scientists feel welcome.

Funding for personnel and equipment awaited the encouragement and expertise of Dean Bell, who procured support from the Natural Resources Conservation Service of U.S.D.A. This funding allowed the search and hiring of a curator and educator (who began work in mid-June 2001 and mid-February 2001, respectively), as well as the employment of students and contractual workers. Funding also provided for the ordering of essential equipment, supplies, and books.

The Claude E. Phillips Herbarium contains specimens of vascular plants, mosses, lichens, fungi, algae, and fossil plants. The vascular plant collection is the most extensive, with about 110,000 specimens from around the world that date back to 1799. The collection of books (about 2500 volumes dating back to 1737), periodicals (numerous issues of 73 different serials), and photographic slides covers a diversity of botanical subjects. Not only is it the only public herbarium on the Delmarva Peninsula, it is the largest herbarium at a Historically Black College or University by at least 10-fold. It is the only cooperative herbarium with signed memoranda of understanding with various federal, state, and private institutions (Natural Resources Conservation Service of U.S.D.A., Delaware Dept. of Natural Resources & Environmental Control, Delaware Dept. of Agriculture, Delaware Nature Society, Mt. Cuba Center for the Study of Piedmont Flora, University of Delaware, and Wesley College). Formal and informal links also exist with The Society of Natural History of Delaware, The Herb Society of America, International Herb Association, and Delaware Herb Growers & Marketers Association. The staff of the Claude E. Phillips herbarium consists of Co-director Arthur O. Tucker, Co-director Thompson D. Pizzolato (University of Delaware), Curator Robert F. C. Naczi, and Educator Susan E. Yost.

The mission of the Claude E. Phillips Herbarium is documentation, research, and education on wild and cultivated flora, particularly of the Delmarva Peninsula. The herbarium seeks to

maintain, provide access to, and augment its extensive collection of vascular plants, mosses, lichens, fungi, algae, and fossil plants. In addition, the herbarium supports research, teaching, and extension activities in such fields as systematics, economic botany, conservation, and biodiversity studies.

The staff of the herbarium has served the public, DSU community, and scientific community in many ways. In 2001 alone, 27 groups and 466 individuals learned about our facilities and programs by participating in tours of the Claude E. Phillips Herbarium. Six students received in-herbarium employment and training in herbarium practices and techniques (over 2,000 hours worked in 2001). Herbarium staff taught 5 classes or workshops using herbarium resources. Fifteen scientists and members of the public from near (e.g. Natural Resources Conservation Service office in Dover, Delaware Geologic Survey office in Newark) and far (e.g. U. S. Geologic Survey office in Florida, editorial office of Australian Wild Herb Bulletin) visited to consult herbarium specimens and literature. Botanical identification, through the Claude E. Phillips Herbarium and The Herb Research Center, and essential oil analyses by gas-chromatography/mass-spectroscopy are provided as support for the public, herb farmers, and members of the scientific community. In 2000, herbarium staff received and answered 23 requests from the public, personnel at state agencies (e.g. Delaware Dept. of Agriculture, Delaware Dept. of Transportation), and members of the larger scientific community for identification of 27 specimens of plants. In 2001, herbarium staff received and answered 21 requests for identification of 69 specimens. Seven individuals ranging from members of the public to U.S.D.A. personnel requested and received information from labels of herbarium specimens during 2000-2001. During 2000-2001, botanists from 5 different universities requested and received loans of 44 specimens from the herbarium for use in various research projects.

The University of Delaware participates in numerous multi-state research projects in support of our State Plan of Work. Highlighted here is the impact of one of these projects: NE 138, Epidemiology and Control of Emerging Strains of Poultry Respiratory Disease Agents.

NE 138 addresses respiratory diseases that have historically caused major economic losses in the poultry industry. Recent restrictions on the poultry industry limiting the use of antibiotics to control these diseases has led to increased pressure on producers to rely more heavily on other methods of disease control, such as the use of vaccines and the emerging technology of antivirals. To support this transition, molecular and conventional research is needed to develop technologies to help identify, diagnose, and control emerging respiratory pathogens.

- This multi-state research project has perfected molecular techniques (PCR) for immediate identification and quantification for six respiratory disease agents in poultry. Scientists have sorted out the strain relationships for the Infectious Bursal Disease virus, and in the process, identified heretofore unknown reservoirs of infection that are bringing about epidemics in flocks. The project has also constructed a recombinant DNA vaccine for the fowl poxvirus, giving mild symptoms and protection from other strains of this virus. Finally, through the project's research activities, the poultry industry benefits directly from the monitoring of respiratory pathogen outbreaks.

- Delaware, along with North Carolina, continues to work on *M. synoviae* genome sequence project, which is working on the development and application of RAPD fingerprinting of pathogenic avian *Mycoplasma* spp., the development of new capabilities by application of a software system for DNA fragment analysis and databasing, assessing the pathogenic potential of emerging avian *Mycoplasma* species or isolates for commercial poultry. Research on the ongoing MG outbreak in house finches will continue to be investigated in terms of avian mycoplasma vaccines.
- Delaware (Drs. Keeler and Dohms) and Minnesota (Dr. Kapur) are sequencing the *Mycoplasma synoviae* (MS) genome, the data of which will be made available on the Internet (<http://udgenome.ags.udel.edu/>). Avian paramyxoviruses (pneumovirus and Newcastle disease virus). Minnesota will continue to investigate APV.
- Delaware and Maryland will evaluate Newcastle disease virus as a vector for delivering IBV S antigen in chickens. Infectious bronchitis.
- Connecticut will continue to evaluate DNA and fowl pox viral vector S1 gene vaccines. Delaware will characterize genotype PA/1220/98 related isolates from geographically widespread regions in the USA and evaluate the replication interference potential of NDV and IBV vaccine strains, while Indiana will send IBDV field isolates to Delaware for S1 genotyping.

The bottom line impact of this NE-138 is to :

- diminished production losses from poultry respiratory diseases, and increased profits for the poultry industry; and
- reduce consumer risks through poultry products free of otherwise necessary antibiotics.

Participants in NE-501 represent experiment stations in DE, MA, MD, NJ, NYC, NYG, PA, AL, AR, CA, FL, GA, MI, MO, NC, OH, SC, TN, and WA, and scientists from USDA-ARS/Maryland and USDA-ARS/West Virginia.