

ANNUAL REPORT: June 1, 2009 – May 31, 2010
(i.e., Summer 2009, AY 2009-2010)
DEPARTMENT OF ENVIRONMENTAL AND FOREST BIOLOGY
SUNY-ESF

NAME: DANILO D. FERNANDO

I. INSTRUCTIONAL ACTIVITIES

1. Regular Course Offerings

	<u>Course No.</u>	<u>Title</u>	<u>Credit Hrs.</u>	<u>No. Students</u>	<u>No. of Lab Sections</u>
SUMMER:	NONE				
FALL:	EFB 427/627	Plant Developmental Biology	3	19	2
	BTC 132	Orientation Seminar in Biotechnology	1	18	0
SPRING	EFB 326	Plant Diversity	3	79	4

NOTE: PLEASE INDICATE WHICH COURSE(S) HAD A SERVICE-LEARNING COMPONENT AND BRIEFLY EXPLAIN THE NATURE OF THIS COMPONENT. For examples of service-learning in courses, see: <http://www.esf.edu/students/service/courses.htm>. Service-learning is a form of structured experiential education in which students engage with the community to be active learners, to enrich their sense of civic responsibility, and to explore practical application for course content. Faculty oversight, reflective thinking, and reciprocity are key components of service-learning. EFB courses currently listed with service-learning components include: 416/6/1, 486, 518, 521, 532, 446/646.

2. Non-Scheduled Course Offerings (e.g., 496, 899, 999)

	<u>Course No.</u>	<u>Title</u>	<u>Credit Hrs.</u>	<u>No. Students</u>
FALL:	BTC 420	Internship in Biotechnology	3	1
	BTC 498	Research Problem/Biotechnology	2/3	2
	EFB 999	Doctoral Thesis Research	3	2
SPRING:	BTC 420	Internship in Biotechnology	5	1
	BTC 498	Research Problem/Biotechnology	3	1
	EFB 999	Doctoral Thesis Research	8/9	2

3. Continuing Education and Extension (short courses, workshops, etc.)

NONE

4. Guest Lecture Activities

<u>Course No.</u>	<u>Title</u>	<u>No. of Lectures</u>
EFB 535:	Flowering Plants: Diversity, Evolution, and Systematics	2

II. STUDENT ADVISING

- A. Number of undergraduates for whom you are the student's official advisor 14 and unofficial advisor 0
- B. Graduate Students: (Name, degree sought, starting date, month & year; if a degree was completed, please give date and full citation for the thesis or dissertation).

MAJOR PROFESSOR

Christina Quinn, Ph.D. Program, Started August 2006
Arnold Salazar, Ph.D. Program, Started January 2007
Maryanne Orlousky, MPS Program, Started August 2009

CO-MAJOR PROFESSOR

NONE

MEMBER, STEERING COMMITTEE (other than those listed above)

Kathleen Baier, M.S. Program, Started August 2006 – EFB. Degree completed December 2009
Collin Fischer, Ph.D. Program, Started August 2005 – Chemistry Department (SB3 Program), SU
Nikhilesh Dhar, Ph.D. Program, Started August 2006 – Biology Department, SU

CHAIRMAN OR READER ON THESIS EXAMS, ETC.

NONE

III. RESEARCH COMPLETED OR UNDERWAY

- A. Departmental Research (unsupported, boot-legged; title - % time spent)

Cloning and bioinformatic analysis of secreted proteins from pine pollen tubes (10%)
Cloning and bioinformatic analysis of microRNAs from pine pollen tubes (10%)
Development of a tissue regeneration protocol for willow (15%)
Development of a pollen derived cell line from Ginkgo (5%)

- B. 1. Grant-supported Research (source, subject, amount - total award and current year, award period starting and ending dates; list graduate research assistants supported by each grant)

Confronting the obstacles to willow genetic transformation (Tim Volk, co-PI). USDA-McIntire-Stennis, \$50,591. May 15, 2010 - Sep 12, 2012. Graduate Research Assistant – Arnold Salazar (Ph.D. student)

2. Research Proposals pending (include information as in B.1., above).

Genetic diversity of American hart's-tongue fern in Clark Reservation, The Nature Conservancy, \$8000

3. Research Proposals submitted, but rejected (include information as in B.1, above)

- Nanoparticle-mediated delivery of DNA to pollen of woody plants. SUNY-ESF, \$6,000.
- Genetic, reproductive and habitat analysis to support American hart's-tongue fern reintroduction and restoration in the Great Lakes region. USDA-USFWS, \$220,770.
- Genomics of Pine Pollen Tube Wall Formation and Regulation. NSF. \$268,574.
- Genetic Improvement of loblolly pine through pollen transformation coupled with artificial pollination. ESF. \$4,000.

IV. PUBLICATIONS (Full bibliographic citation, i.e., do not use "with Jones," or "Jones, et al."; please list only publications published, in press, or actually submitted during this reporting period --- **do not list manuscripts in preparation**).

A. Refereed Publications

Fernando DD, Quinn CR, Brenner E, Owens JN. Male gametophyte development and evolution in gymnosperms. Invited Review. International Journal of Plant Developmental Biology (in press). Delay in publication is due to it being moved from a regular article to being part of a Special Issue.

Owens JN and Fernando DD. 2009. Developmental, ultrastructural and molecular studies of male and female sterility in western white pine (*Pinus monticola*). In: D. Noshad, N.E. Woon, J. King and R.A. Sniezko (eds). Breeding and Genetic Resources of Five-Needle Pines. Proceedings of the Conference 2008. Yangyang, Korea, pp. 71-72.

Owens JN, Kittirat T, and Fernando DD. 2009. Factors affecting seed production in *Pinus monticola* and *P. albicaulis*. In: D. Noshad, N.E. Woon, J. King and R.A. Sniezko (eds). Breeding and Genetic Resources of Five-Needle Pines. Proceedings of the Conference 2008. Yangyang, Seoul, Korea, pp. 35-44.

B. Non-refereed Publications

*Fernando DD. 2009. Conifer Reproductive Biology: Invited Book Review. International Forestry Review 11(4):534-535.

*Fernando DD. 2010. Conifer Reproductive Biology: Invited Book Review. Plant Science Bulletin 56(1): 32-33.

*Same review published in two different journals/forums

C. Papers Presented at Science Meetings (give title, date, occasion, and location)

Towards our understanding of pollen tube biosynthesis and evolution. Gordon Research Conference, Bryant University, Smithfield, RI. August 2-7, 2009.

D. Public Service Presentations (lectures, seminars, etc. to and for the public; give group or occasion, date(s), and attendance)

NONE

V. PUBLIC SERVICE

A. Funded Service (include consulting activities)

1. Government Agencies (Federal, State, Local):

NONE

2. Industrial and Commercial Groups, etc.

NONE

B. Unfunded Service to Governmental Agencies, Public Interest Groups, etc.

Judge, Best Poster (Graduate Student), Spotlight on Student Research, SUNY-ESF, April 12, 2010.

VI. PROFESSIONAL DEVELOPMENT

A. Professional Honors and Awards (for teaching, research, outreach, etc.)

B. 1. Activities in Professional Organizations (offices held, service as chairman, member, participant or consultant)

2. Professional Society Membership

3. Other Professional Activities

a. Editorial activity

<u>Journal (s)</u>	<u>Responsibility</u>
International Journal of Plant Developmental Biology (IJPDB)	Member, Editorial Board
International Journal of Plant Developmental Biology (IJPDB)	Special Issue Editor

Other (books, symposia, etc.)

b. Reviewer

<u>Journal(s)</u>	<u>No. of manuscripts</u>
IJPDB	10
American Journal of Botany	1
Scientia Horticulturae	1

<u>Agency</u>	<u>No. of proposals</u>
NSF (Developmental Systems Cluster)	1
USDA	1

For the department/college: I served as the Director of our graduate program (for the third year) and my major responsibilities included the following: 1) replied to various inquiries about our graduate program (through email, phone, and/or personal visits) on an almost daily basis from several potential applicants and current graduate students, 2) processed a total of 129 applications (22 for spring and 107 for fall) that involved reviewing each application for initial assessment and to designate specific reviewers, following up on the completion of the reviews on each application, summarizing the reviews for each application, and submitting EFB's recommendation for each accepted and rejected applications to the Dean of Instructions and Graduate Studies, and 3) provided orientation seminars to new graduate students about our graduate program. I also served as the department's representative to the Graduate Council and raised issues regarding problems/suggestions on how to improve the graduate program. I have also shared the ideas and activities of OIGS to the department's graduate committee and faculty. As the coordinator on optical instruments in the department, I worked with Bridget McMaster regarding various problems on light microscopes and teaching needs.

For my professional accomplishments, the following are what I consider as significant: 1) served as a Guest Editor for a Special Issue on Plant Development and Evolution by the International Journal of Plant Developmental Biology. I have received and reviewed all 10 invited reviews from various colleagues around the world, invited and formed at least three reviewers for each of the manuscripts, reviewed and synthesized the reviewers' comments for each of the manuscripts. I also made sure that most of the reviewers' comments were addressed in the revised manuscripts. This Special Issue will be published in July 2010; 2) served in the USDA Plant Biology: Growth and Development panel to review grant applications in Washington DC in September 2009. I reviewed 16 grant proposals (as primary, secondary or tertiary reviewer) and participated in the deliberations of at least 75 proposals; and 3) following proposal review, integration of reviewers' comments/suggestions and various other negotiations, the publisher - Taylor and Francis Group has unofficially approved our proposal (with my co-author - Dr. John N. Owens) to write a textbook on "Sexual Reproduction of Trees." The start date of this 15-month activity is still under negotiation.

IX. A. FUTURE PLANS, AMBITIONS, AND POTENTIAL CONTRIBUTIONS FOR YOUR OWN PROFESSIONAL DEVELOPMENT AND THE ENHANCEMENT OF THE PROGRAM IN ENVIRONMENTAL AND FOREST BIOLOGY (brief summary)

For the next academic year, the bulk of my time will be spent in the following activities: 1) teaching, 2) research, 3) graduate admissions, and 4) textbook writing.

B. PROJECTED ACTIVITIES FOR NEXT YEAR

1. Summer 2010

- a. Course(s) to be offered

- b. Proposed research activity

- c. University, professional society, and public service

2. Fall Semester 2010

- a. Course(s) to be offered

EFB 427/627: Plant Developmental Biology
BTC 132: Orientation Seminar for Biotechnology Majors

b. Proposed research activity

In vitro regeneration of willow
Genetic diversity of American harts-tongue fern
Write grant applications, particularly on use of molecular markers to refine willow selection

Mechanism of pine pollen germination (roles of microRNAs and secretory proteins)

c. University, Professional society, and public service

Review of graduate applications, participate in the activities of GPAC and Graduate Council.

3. Spring Semester 2010

a. Course(s) to be offered

EFB 326: Plant Diversity

b. Proposed research activity

In vitro regeneration of willow
Mechanism of pine pollen germination (roles of microRNAs and secretory proteins)
Write grant applications

c. University, professional society, and public service

Review of graduate applications and participate in the activities of GPAC and Graduate Council.