

- i evolutionary rate increases with metabolic rate. (G R Smith)
- ii super trees, especially for pharmaco-genomics (Davide Pisani)
- iii DNA sequence data to elucidate ancient phylogenetic relationships among major lineages (with Y.L. Qiu, M. Frohlich)

PH.D. THESIS COMMITTEES CHAIRED

- Maturen, N. 2008. Evolution of petaloid bracts in *Cornus*.
Co-Chair: Micheal Frohlich, British Museum Natural History
- Schoolmaster, D. 2004. The Distribution and Abundance of Swamp Dodder, *Cuscuta gronovii* (Convovulaceae) in Wetlands of Southeast Michigan Post Doc Dept Ecology Case Western U.
- Salisbury, B. 1999. Estimation of Evolutionary Relationships by Computationally Intense Techniques Using "Strongest Evidence" Research Scientist, Gennaissance Inc New Haven CT
- Kirkpatrick, H.E (1990) Resource Competition between Two Co-occurring Species of *Polytrichum*. Assoc Prof, Evergreen WA
- Cresswell, J.E. (1989) The Foraging Success of Bumblebees on Wild Bergamot: A Comparison with Optimality Models (Including Methods for Measuring Floral Nectar). Lecturer, U. Exeter, England UK
- McCann, M. (1989) Ecological Life History of the Annual Plant *Floerkia proserpinacoides* in a Forest Understory.
- Gorchov, D.L. (1987) Proximate and Ultimate Causes of Fruit Ripening Asynchrony in Vertebrate Dispersed Plants in South-eastern Michigan. Assoc Prof Botany, Miami of Ohio, Oxford OH
- McKnight, K.B. (1985) The Adaptive Morphology of *Flamulina velutipes* with respect to Water Stress.
Associate Professor of Botany, St Lawrence U. Canton NY
- Horwith, B.J. (1983) The Interactions of Plant Species Following Plowing of Old Fields in Michigan. Research Analyst, USDA
- Huston, M.A. (1982) Effect of Soil Nutrients and Light on Tree Growth and Interactions during Tropical Forest Succession: Experiments in Costa Rica. Professor, University of Texas at Brownsville
- Meacham, C.A. (1981) The Estimation of Evolutionary History with Reference to the Berberidaceae. Jepsom Herbarium, UC Berkeley CA
- Oden, N.L. (1981) The Mating Behavior of *Phiddipus audax*.

Statistical consultant, Bethesda MD

Winsor, J.A. (1981) Germination and Establishment in *Impatiens capensis*: Adaptations to Interspecific Competition.
Professor Pennsylvania State University at Haselton

Kukor, J.J. (1979) Effects of Bark and Sapwood Micro-organisms on Development of Hypoxylon Canker of Aspen. (H. Morton, co-Chair)
Professor, Rutgers University, New Jersey

Sakai, A.K. (1978) Ecological and Evolutionary Aspects of Sex Expression in Silver Maple (*Acer saccharinum* L.)
Assoc. Prof. Biology UC Riverside

Stephenson, A.G. (1978) The Flowering and Fruiting Strategy of *Catalpa speciosa* (Bignoniaceae). Professor, Penn State University

SPECIAL LECTURES (selected from past 10 years)

Quantitative Evolutionary Systematics.
June 2008 Botany Institute, University of Vienna, Vienna, Austria

O papel de agua na nutricao humana.
May 2008 Inst Sup Technologia Maritima Peniche. Leiria, Portugal

Bagaco e biodiversidade na agricultura tradicional de Portugal
Feb 2007 Estacao Nacional de Vitivinicula, Dois Portos, Portugal

Testing the hypothesis that faster metabolic rates result in faster evolutionary rates, with the Cyprinids (minnows) of North America
May 2006 RIKEN Institute, Tokyo Japan

Stratigraphic Compatibility Analysis.
Aug 2005 Sponsored speaker, Systematics Association, Cardiff Wales

Using mass spectrometry to quantify the role of Giesta (*Cytisus*, Fabaceae) in the maintenance of nitrogen soil fertility in the traditional agriculture of Beira Alta, Portugal
Mar 2004 Conference, Society for Ethnobiology, UC Davis, CA

O Ciclo de Azoto na Agricultura Tradicional de Beira Alta Portugal
Feb 2003 Universidade de Coimbra, Mar 2003 Escola Agraria Superior de Coimbra, Apr 2003 Universidade de Lisboa, May 2003 Escola Agraria Superior de Castelo Branco, todas em Portugal

Uma Abordagem Computacional a Significancia Estatistica em Analyse Multivariavel Usando PHENCON. Intensive Workshop over several days
Oct 2002 Faculdade de Ciencias, Universidade de Lisboa Portugal
Feb 2003 Depto Antropologia, Universidade de Coimbra, Portugal
May 2003 Estacao Nacional Vitivinicula, Tornas Vedras, Portugal

Dress Color and Age in 19C Rural Portugal: Analysis of Small Amounts of Qualitative Data by Computational Means
Mar 2002 Ethnobiology Conference, U. Connecticut, Storrs, CT

Giesta (Cytisus, Fabaceae): essential wild resource used by the traditional agriculture of Trancoso, Portugal.
May 2002 Estacao Agrinomica Nacional, Oeiras Portugal
Mar 2001 Ethnobiology Conference, Ft Lewis College, Durango CO

Maintenance of Soil Fertility and BioDiversity by the Traditional Practices of Portuguese Agriculture
Mar. 2002 Dept Agronomy, UC Davis, CA
Oct. 1999 Ohio University, Athens, Ohio

Culture and technology in traditional Portuguese agriculture.
Dec. 1999 Peirson College, Yale University, New Haven CT
Mar. 1999 Beloit College, Wisconsin

Rhizomatous grass in the irrigation technology of traditional Portuguese agriculture.
Mar 1999 Ethnobiology Conference. Oaxaca MX

A significacao de groups por metodos de computacao intensiva.
Feb 1999 Universidade Catolica de Minas Gerais, Brazil

TEACHING EXPERIENCE

CURRENT

Fall BIO 105 Biology of Human Nutrition 4 credits Lecture and Discussion. This course, currently with about 240 students, explains the physiological basis for our normal dietary needs, including some quantitative, evolutionary and scientific reasoning, and addressing some social, public health, and world hunger issues. Since 1999

Winter BIO 102 How People Use Plants 4 credits Lecture Discussion and Lab. Motivated by interests in how to create and care for their future home landscape, how to care for a flower or vegetable garden, and how to select and care for house plants, about 150 undergraduates now study botany with me every winter. We look at plant evolution, ecology, diversity, function, and form plus some gardening and other traditional technology. Students spend 3 hours a week in the green house growing plants and learning practical techniques. Since 1988

Winter EEB 480 A Computational approach to statistical argument. 3 credits Lecture/Discussion/Computer Lab. Ten or a dozen Ph.D. students and post docs learn to formulate hypotheses that include a random process, and to calculate predicted probability distributions by simulation using computers. The use of sophisticated mathematics

was formerly necessary to avoid impossible amounts of computation, which are now very possible using computers. Because such mathematics is difficult and obscures scientific argument, the techniques taught in this course make scientists more competent and responsible when arguing the credibility of scientific hypotheses using prediction and data.

RECENT PAST

Fall BIO 401 Economic Botany. A plant biodiversity course motivated by economic uses of plants. The goals of the course include learning how, where, and why people domesticated plants; how domestic plants have changed during their association with people; how do we study these questions, what evidence do we use, and how our understanding has changed through history; what have been (and now are) some of the social, moral, political, and health issues related to economic plants.

INDEPENDENT STUDY

I usually supervise several undergraduates in independent study, usually related to some aspect of human nutrition, and advise the currently three undergraduates concentrating in human nutrition

SPECIAL ONE TIME COURSES IN THE RECENT PAST

WINTER 2002 Classical Archeology 443 Urbanism in the Mediterranean. 4 credits. Compared the cities of Athens and Alexandria in modern perspective by consideration of ecological characteristics of their sites, their architecture and their literature. Team taught with professors of Anthropology, Classical Archeology and Architecture.

Winter 2001 BIO 281 General Ecology 3 credits Lecture/Discussion I filled in, this term, to teach this survey of ecology for natural science majors. Most students were premeds, but a few interested.

THE PUBLICATIONS of G. F. ESTABROOK since 1997 of about 120 career

Under consideration by Jones & Bartlett Publishers

Estabrook, G.F. A Computational Approach to Statistical Argument, with examples in Java and EXCEL. Textbook + 400 MS pages

Accepted

Rissech, C., G.F. Estabrook, A. Schmitt, A. Malgosa, and E. Cunha
The influence of pathologies on indicators of age at death from the coccyx of adults. Journal of Forensic Science

2008

Estabrook, G.F. Fifty Years of Character Compatibility Concepts at Work. *Journal of Systematics and Evolution* 46(2):109-129

Estabrook, G.F. The Significance of Sheep in the Traditional Agriculture of Beira Alta, Portugal. *EthnoBiology* 28:(1)

Qiu, Y-L. and G.F. Estabrook. Phylogenetic relationships among key angiosperm lineages using a compatibility method on a molecular data set. *Journal of Systematics and Evolution* 46(2):130-141

2007

Estabrook, G.F. Living Grass Irrigation Ditches in Traditional Portuguese Agriculture: Autecology in the study of Ethnobotany. *Ethnobotany Research and Applications* 5:319-330

Estabrook, G.F., G.R. Smith & T.E. Dowling. Body Mass and Temperature Influence Rates of Mitochondrial DNA Evolution in North American Cyprinid Fish. *Evolution* 61-5: 1176-1187

Rissech, C., G.F. Estabrook, E. Cunha, and A. Malgosa. Estimation of Age-at-Death for Adult Males Using the Acetabulum, Applied to Four Western European Populations. *J. Forensic Science* 52(4): 774-778

2006

Estabrook, G.F. Neither Wild nor Planted: Essential Role of Giesta (*Cytisus*, Fabaceae) in Traditional Agriculture of Interior Beira Alta, Portugal. *Economic Botany* 60(4):307-320

Qiu, Y-L., et al. (including G F Estabrook) The Deepest Divergences in Land Plants Inferred from Phylogenetic Evidence. *Proceedings of the National Academy of Science*. 103 (42): 15511-15516

Moerman, D.E., and G.F. Estabrook. The Botanist Effect: Counties with Maximal Species Richness Tend to be Home to Universities and Botanists. *Journal of Biogeography* 33:1-6

Estabrook, G.F. and F.R. McMorris. The Compatibility of Stratigraphic and Comparative Constraints on Estimates of Ancestor Relations. *Systematics and Biodiversity* 4:1-9

Estabrook, G.F. Synopsis of Symposium on Compatibility Analysis at the Systematics Association Meeting in Cardiff, Wales. *Taxon*

2005

Rissech, C., G.F. Estabrook, E. Cunha & A. Malgosa. Using the Acetabulum to Estimate Age at Death of Adult Males. *Journal of Forensic Science* 51:213-229

2004

Stutz, A.J. and G.F. Estabrook. Computationally Intense Multivariate Statistics and Relative Frequency Distributions in Archeology. *Journal of Archeological Science* 31:1643-1658

2003

Moerman, D.E. and G.F. Estabrook. Native Americans' Choice of Native Species for Medicinal Use is Dependent on Plant Family: Confirmation with Meta-Significance. *Ethno-Pharmacology* 87:51-60

2002

Estabrook, G.F. How Can We Care for our Old People and Children: a Case Study of Portuguese Peasants. in P.B. Kaufman et al (eds) *Creating A Sustainable Future*. Sci. & Tech. Publications Austin TX

Estabrook, G.F. Two Hypotheses of Independence for the Recognition of Qualitative Co-occurrence in Small Amounts of Data. *Historical Methods* 35:21-31

Estabrook, G.F., V.C. Almada, F.,J. Almada, and J.I. Robalo. Analysis of conditional contingency using ACTUS2, with examples from animal behavior. *Acta Ethologica* 4:73-80

2001

Estabrook, G. F. The Use of Natural History Data to Test Competing Hypotheses of Disjunction of *Genista ephedroides* species complex on the Tyrrhenian Coast. *Journal of Biogeography* 28(2):95-103

2000

Frohlich, M. and G.F. Estabrook. Wilkinson Support, Calculated with Exact Probabilities: An Example Using *Floricaula/LEAFY* Amino Acid Sequences that Compares Three Hypotheses Involving Gene Gain/Loss in Seed Plants. *Molecular Biology and Evolution* 17: 1914-1925

Estabrook, G.F. Choice of Fuel for Bagaco Stills in a Traditional

Portuguese Agricultural System Contributes to the Maintenance of Biological Diversity. in P.E. Minis (ed), Ethno-Botany, University of Oklahoma Press Norman OK USA

1998

Estabrook, G.F. Maintenance of Fertility of Shale Soils in a Traditional Agricultural System in Central Interior Portugal. *Ethnobiology* 18:15-33

Goldberg, D. and G. F. Estabrook. Separating the effects of number of individuals sampled and competition on species diversity: an approach and example combining experiments and computationally-intense analytical methods. *J. Ecology* 86:983-8

Day, W. H. E., G. F. Estabrook and F. R. McMorris. Assessment of the Phylogenetic Randomness of a Data Set. *Syst. Biol.* 47:604-616

1997

Julius, M.L., G.F. Estabrook, M.B. Edlund and E.F. Stoermer. Recognition of taxonomically significant clusters near the species level, using computationally intense methods, with examples from the *Stephanodiscus niagare* complex (Bacillariophyta). *Journal of Phycology* 33:1049-1054

Estabrook, G.F. Ancestor-Decendant Relations and Incompatible Data: Motivation for Research in Discrete Math. (in) *Mathematics of Hierarchies and Biology*. B. Mirkin, F.R. McMorris, F.S. Roberts and A. Rzhetsky eds. AMS Providence RI pp 1-28

Camacho, A.I., E. Bello, and G.F. Estabrook. A Statistical Approach to the Evaluation of Characters to Estimate Evolutionary Relationships among the Species of the Aquatic Subterranean Genus, *Iberobathynella* (Crustacea, Syncardia). *Biological Journal of the Linnean Society* 60:121-141