

April 10, 2007

CURRICULUM VITAE

Frank William Ewers

**California State Polytechnic University, Pomona
Biological Sciences Department
3801 West Temple Avenue, Pomona, CA 91768**

EDUCATION:

1976 **B.S., Botany**, University of Wisconsin, Madison
1982 **Ph.D., Botany**, University of California, Berkeley
1982-84 **Post-Doctoral**, Harvard Forest, Harvard University

POSITIONS HELD:

Since January 2007, **Professor and Department Chair**, Biological Sciences, California State Polytechnic University, Pomona.
1995-2006, **Professor**, Michigan State University, Department of Plant Biology, Michigan State University (MSU), East Lansing, MI 48824.
Since 1995, **Professor**, Department of Plant Biology and the Ecology, Evolutionary Biology and Behavior Program, Michigan State University (MSU), East Lansing, MI 48824.
2002-2005, **Director of Graduate Studies** in Plant Biology, MSU.
2001-2002, **Acting Chair of the Department of Plant Biology**.
1993- 2003, **Director of Undergraduate Studies** in Botany and Plant Pathology
1989-1995 **Associate Professor**, Department of Botany and Plant Pathology, MSU.
1984-1989 **Assistant Professor**, Department of Botany and Plant Pathology, MSU.
August 1999, '00, May '01, '02, and January '06 to present: **Visiting Research Professor**, *Instituto de Ecología*, Xalapa, Veracruz, Mexico. Research on mangrove trees.
Summers 1991, '94-'97, '99- '06: **Visiting Research Professor**, Pepperdine University, Malibu, CA. Research on the biology of chaparral plants.
July - December 1998; May 1999; October 2000: **Visiting Professor**, *INRA*, *PIAF* (Integrated Tree Physiology Lab) Blaise Pascal University, Clermont-Ferrand, France. Research on the physiology of walnut trees.
Summers 1993, '95: **Visiting Research Professor**, *UNAM* (National University of Mexico), *Los Tuxtlas* Tropical Research Station. Research on woody vines and related species.
Summer/Fall 1991: **Visiting Scientist**, University of California at Los Angeles (UCLA), Department of Biology. Research on desert plants of California.

POSITIONS HELD (con't):

- 1985 – 88: **Research Associate**, Fairchild Tropical Garden, Miami, FL. Research on woody vines.
- Fall 1980: **Instructor**, Biology Department, University of California, Santa Cruz, CA.
Course taught: Bio 106, *Plant Anatomy*.
- 1976 – 81: **Teaching Assistant**, Botany Department, U. California, Berkeley.
- Jul - Oct 1979: **Agricultural Inspector**, California Department of Food and Agriculture.
- Aug - Oct 1977: **Consultant**, California Native Plant Society.
- Jul - Oct 1977: **Research Assistant**, University of California Berkeley Herbarium.

MEMBERSHIPS IN PROFESSIONAL SOCIETIES:

American Association for the Advancement of Science
American Association of Botanical Gardens and Arboreta
Botanical Society of America
California Native Plant Society
Ecological Society of America
Fairchild Tropical Garden
International Association of Wood Anatomists
Jardin Botanico Wilson (Wilson Botanical Garden)
Sigma Xi

AWARDS AND GRANTS:

- 2004-2007 **USDA NRICGP** (\$199,000). Functional relations between lignin monomer composition and xylem properties (with Frank Telewski, PI and K Han, Co-PI).
- 2002-2005 **NSF** (\$370,000). Collaborative Proposal: Linking Xylem Functional Traits to Life-History Type in California Chaparral (Frank Ewers and Steve Davis co-PI's).
- 2003-2005 (\$6,000). **NSU REU** Supplement to Collaborative Proposal: Linking Xylem Functional Traits. (Frank Ewers, PI).
- 2003 **DOE** (\$5,000) Fourth International Plant Biomechanics Conference (Frank Telewski, Frank Ewers, Lawrence Drzal, co-PI's). U.S. Department of Energy.
- 2002-2004 **USDA NRICGP** (\$110,000). Tradeoffs between mechanical strength, xylem safety, and conductive efficiency (with Frank Telewski, PI).
- 1998-00 **INRA Grant** (\$26,200). Summer and Winter Embolism in Walnut: mechanisms of occurrence and repair (Frank Ewers with Pierre Cruiziat in Clermont-Ferrand, France).
- 1995-1998 **NSF Grant** (\$96,204). Mechanism of Low Temperature Tolerance in Chaparral Shrubs, Frank Ewers and Steve Davis co-PI's.
1996. **Michael Cichan Award**, for best published paper in the area of plant structure/evolution (Award shared with co-author Jack Fisher).
1992. **Smithsonian Travel Grant** (\$1,750), Research on tropical trees.
1991. **Teacher-Scholar Award**, Michigan State University, for recognition of "exceptional dedication and skill in undergraduate teaching".

AWARDS AND GRANTS RECEIVED (con't):

- 1991-92. **NSF Grant** (\$97,740), Undergraduate Research in Biology. Steve Davis, PI, Lee Kats, Frank Ewers and J. Gary Tallman, Co-PIs.
- 1985-88 **NSF Grant** BSR-8506370 (\$88,072 for three years), The hydraulic architecture of tropical lianas, with Jack Fisher, Co-PI.
- 1985-88 **USDA Grant** 85-FSTY-9-0137 (\$175,000), Hypovirulence: A biological control for chestnut blight, Dennis Fulbright, PI, Frank Ewers, Co-PI.
- 1988 **Research Excellence Fund** (REF), State of Michigan (\$22,402), Isolation of *Frankia* genes controlling the development of the dinitrogen-fixing symbiosis in actinorhizal plants. Frank Ewers, PI, Marcia Murry-Ewers, Co-PI.
- 1987-2000 **USDA NE-140 Regional Chestnut Grant** (\$5,000 per year awarded). Dennis Fulbright, Project Leader, Andrew Jarosz, Helmut Bertrand, Frank Ewers, Co-Investigators.
- 1987 **MSU All University Grant** (\$6,350), Water transport in *Bauhinia*.
- 1987 **Young Botanist Award, XIV International Botanical Congress**, West Berlin.
- 1987 **NSF Travel Grant** to attend Botanical Congress.
- 1984 **Alexander von Humboldt Stipend** (awarded for 2 years research in Germany). Declined.

PUBLISHED BOOK REVIEWS, NOTES and notable non-reviewed publications:

- 2004 Angeles G. et al. (Ewers is one of 45 co-authors). The cohesion-tension theory. *New Phytologist*. Letter to Forum. 163: 451-452.
- 2003 Telewski, F.W., F.W. Ewers and L. Köhler (Editors) *Plant Biomechanics 2003, Conference Proceedings, 20-25 July 2003*. Michigan State University Press.
- 2000 Ewers, F.W. Growing an undergraduate program in botany and plant pathology. *Plant Science Bulletin* 46:4-5.
- 1990 Ewers, F.W. Comparative wood anatomy: systematic, ecological, and evolutionary aspects of dicotyledon wood. Book by S. Carlquist. *Taxon* 39:67-68 (book review).
- 1987 Ewers, F.W. and J.B. Fisher. Water transport in lianas. *Fairchild Trop. Gard. Bull.* 42(4):28-29
- 1987 Knobloch, I.W., and Ewers, F.W. Gemmae in *Lycopodium lucidulum* (Lycopodiaceae). *L.A.I.F.S. Fern Journal* 14:89-90.
- 1983 Ewers, F.W. Xylem structure and the ascent of sap. Book by M.H. Zimmermann. *Plant Sciences: Newsletter of the Arnold Arboretum* 3(3): 6-7 (book review).

BOOK CHAPTERS:

- 2005 Koehler, L., F.W. Ewers, F.W. Telewski. Optimizing for multiple functions: Mechanical and structural contributions of cellulose microfibrils and lignin in strengthening tissues. In: *Characterization of the Cellulosic Cell Wall*. Edited by D.D. Stokke and L.H. Groom, Blackwell Publishing, Ames, Iowa USA, 20-29.
- 2005 Davis, S.D., F.W. Ewers, R. Brandon Pratt, Pamela L. Brown, T.J. Bowen. Interactive effects of freezing and drought on long distance transport: A case study of chaparral shrubs of California. In: *Vascular Transport in Plants*. Edited by N.M. Holbrook and M.A. Zwieniecki, Elsevier/Academic Press co-imprint, Oxford, 425-435.
- 2004 Baas, P., F.W. Ewers, S.D. Davis, E.A. Wheeler. Evolution of xylem physiology. In: *The Evolution of Plant Physiology*. Edited by A.R. Hemsley and I. Poole, Linnean Society Symposium Series number 21, Elsevier Academic Press, London, 273-295.
- 1996 Tyree, M.T. and F.W. Ewers. Hydraulic architecture of woody tropical plants. In: *Tropical Forest Plant Ecophysiology*. Edited by S.S. Mulkey, R.L. Chazdon, A.P. Smith. Chapman & Hall, New York. pp. 217-243.
- 1995 Pallardy, S.G., J. Cermak, F.W. Ewers, M.R. Kaufmann, W.C. Parker, and J.S. Sperry. Water transport dynamics in trees and stands. In: *Resource Physiology of Conifers: Acquisition, Allocation and Utilization*. Edited by W.K. Smith and T.M. Hinckley, Academic Press. pp. 299-387.
- 1991 Ewers, F.W. and Cruiziat, P. Measuring water transport and storage. In: *Techniques and Approaches in Forest Tree Ecophysiology*, Edited by J. P. Lassoie and T. M. Hinckley, CRC Press, Boca Raton, 91-116.
- 1991 Ewers, F.W., J.B. Fisher and K. Fichtner. Water flux and xylem structure in vines. In: *The Biology of Vines*. Edited by F. Putz, and H. Mooney. Cambridge University Press, New York. 119-152.
- 1991 Fisher, J.B. and F.W. Ewers. Structural responses to stem injury in vines. In: *The Biology of Vines*. Edited by F. Putz, and H. Mooney. Cambridge University Press, New York. 91-116.

ARTICLES IN REFEREED JOURNALS:

- 200- Pratt R.B, Jacobsen A.L., Golgotiu K.A., Sperry J.S., Ewers F.W. Davis S.D. Life history type coupled to water stress tolerance in nine Rhamnaceae species of the California chaparral. *Ecological Monographs* (in press).
- 2007 Ewers F.W., Ewers J.M., Jacobsen A.L., López-Portillo, J. Vessel redundancy: modeling safety in numbers. *International Association of Wood Anatomists Journal*. (in press).
- 2007 Pratt R.B., Jacobsen A.L., Ewers F.W., Davis S.D. Relationships among xylem transport, biomechanics, and storage in stems and roots of nine Rhamnaceae species of the California chaparral. *New Phytologist*. (in press).
- 2007 Jacobsen A.L., Ewers F.W., Pratt R.B., Davis S.D. Cavitation resistance among twenty-six chaparral species of southern California. *Ecological Monographs* 71: 99-115.

- 2007 Jacobsen A.L., Agenbag L., Esler K.J., Pratt R.B., Ewers F.W. & Davis S.D. Xylem density, biomechanics, and anatomical traits correlate with water stress in 17 evergreen shrub species of the the Mediterranean-type climate region of South Africa. *Journal of Ecology* 95: 171-183.
- 2006 Olmstead M.A., Lang N.S., Ewers F.W., Owens S.A. Xylem vessel anatomy of sweet cherries grafted onto dwarfing and non-dwarfing rootstocks. *Journal of the American Society of Horticultural Science* 131: 557-585.
- 2006 Olmstead M.A., Lang N.S., Lang G.A., Ewers F.W., Owens S.A. Examining the vascular pathway of sweet cherries grafted onto dwarfing rootstocks. *HortScience* 41: 674-679.
- 2005 Jacobsen A.L., Ewers F.W., Pratt R.B., Paddock W.A. III, Davis S.D. Do xylem fibers affect vessel cavitation resistance? *Plant Physiology* 139: 546-556.
- 2005 López-Portillo, Ewers F.W., Angeles G. Sap salinity effects on xylem conductivity in two mangrove species. *Plant, Cell and Environment* 28: 1285-1292.
- 2005 Pratt R.A., Ewers F.W., Lawson M.C, Jacobsen A.L., Brediger M., Davis S.D. Mechanisms for tolerating freeze-thaw stress of two evergreen chaparral species: *Rhus ovata* and *Malosma laurina* (Anacardiaceae). *American Journal of Botany* 92: 1102-1113.
- 2005 Kern K.A, Ewers F.W., Telewski F.W. and Koehler L. 2005. Mechanical perturbation affects conductivity, mechanical properties, and aboveground biomass of hybrid poplars. *Tree Physiology* 25, 1243-1251.
- 2004 Ewers F.W., López-Portillo J., Angeles G., Fisher J.B. Hydraulic conductivity and embolism in the mangrove tree *Laguncularia racemosa*. *Tree Physiology* 24: 1057-1062.
- 2004 Angeles G., Owens S.A., Ewers, F.W. Fluorescent shell: a novel view of sclereid morphology with the confocal laser scanning microscope. *Microscopy Research and Technique* 63: 282-288.
- 2003 Ewers F.W., Lawson M.C., Bowen*T.J., Davis S.D. Freeze/thaw stress in *Ceanothus* of southern California chaparral. *Oecologia* 136: 213-219.
- 2003 Woodrum C.L., Ewers F.W., Telewski F.W. Hydraulic, biomechanical and anatomical interactions of xylem from five species of *Acer* (Aceraceae). *American Journal of Botany* 90: 693-699.
- 2002 Davis S.D., Ewers F.W., Sperry J.S., Portwood K.A., Crocker M.C., Adams G.C. Shoot dieback during prolonged drought in *Ceanothus* (Rhamnaceae) chaparral of California: a possible case of hydraulic failure. *American Journal of Botany* 89: 820-828.
- 2001 Améglio T., Cochard H. and Ewers F.W. Stem diameter variations and cold hardiness in walnut trees. *Journal of Experimental Botany* 52: 2135-2142.
- 2001 Ewers F.W., Améglio T., Cochard H., Beaujard F., Martignac M., Vandame M., Bodet C., and Cruiziat P. Seasonal variation in xylem pressure of walnut trees: root and stem pressures. *Tree Physiology* 21: 1123-1132.
- 2001 Jaquish, L.L. and F.W. Ewers. Seasonal conductivity and embolism in the roots and stems of two clonal ring-porous trees, *Sassafras albidum* (Lauraceae) and *Rhus typhina* (Anacardiaceae). *American Journal of Botany* 88: 206-212.

- 2001 Améglio T., Ewers F.W., Cochard H., Martignac M., Vandame M., Bodet C. and P.Cruiziat. Winter stem pressures in walnut trees: effects of carbohydrates, cooling and freezing. *Tree Physiology* 21: 387-394.
- 2000 Tibbetts T.J. and F.W. Ewers. Root pressure and specific conductivity in temperate lianas: exotic *Celastrus orbiculatus* (Celastraceae) versus native *Vitis riparia* (Vitaceae). *American Journal of Botany* 87: 1272-1278.
- 2000 López-Portillo J., F.W. Ewers, G. Angeles, J.B. Fisher. Hydraulic architecture of *Monstera acuminata*: evolutionary constraints of the hemiepiphytic growth form. *New Phytologist* 145: 289-299.
- 1999 Davis, S.D., Ewers, F.W., Wood J., Reeves J.J. and K.J. Kolb. Differential susceptibility to xylem cavitation among three pairs of *Ceanothus* species in the Transverse Mountain Ranges of Southern California. *Ecoscience* 6: 180-186.
- 1998 Wagner, K.R., Ewers F.W. and S.D. Davis. Tradeoffs between hydraulic efficiency and mechanical strength in the stems of four co-occurring species of chaparral shrubs. *Oecologia* 117: 53-62.
- 1998 Boorse, G.C., F.W. Ewers and S.D. Davis. Response of chaparral shrubs to below freezing temperatures: acclimation, ecotypes, seedlings versus adults. *American Journal of Botany* 85: 1224-1230.
- 1998 Boorse, G.C., T.L. Gartman, A.-C. Meyer, F.W. Ewers and S.D. Davis. Comparative methods of estimating freezing temperatures and freezing injury in leaves of chaparral shrubs. *International Journal of Plant Science* 159: 513-521
- 1998 Owens, S.A., Fields, P.A., and F.W. Ewers. Degradation of the upper pulvinus in modern and fossil leaves of *Cercis* (Fabaceae). *American Journal of Botany* 85: 273-284.
- 1997 Pratt, S.D., Konopka, A.S., Murry, M.A., Ewers, F.W. and S.D. Davis. Influence of soil moisture on the nodulation of post fire seedlings of *Ceanothus* spp. growing in the Santa Monica Mountains of Southern California. *Physiologia Plantarum* 99: 673-679
- 1997 Owens, S. A. and F.W. Ewers. Experimentally induced changes in bud fates in *Cercis canadensis* L. (Fabaceae). *International Journal of Plant Science* 158: 525-536.
- 1997 Langan, S.J., F.W. Ewers and S.D. Davis. Xylem dysfunction caused by water stress and freezing in two species of co-occurring chaparral shrubs. *Plant, Cell and Environment* 20: 425-437.
- 1997 Fisher, J.B., G. Angeles, F.W. Ewers and J. López-Portillo. Survey of root pressure in tropical vines and woody species. *International Journal of Plant Science* 158: 44-50.
- 1997 Ewers, F.W., M.R. Carleton, J.B. Fisher, K.J. Kolb and M.T. Tyree. Vessel diameters in roots versus stems of tropical lianas and other growth forms. *International Association of Wood Anatomists Journal* 18: 261-279.
- 1997 Ewers, F.W., Cochard, H. and M.T. Tyree. A survey of root pressures in vines of a tropical lowland forest. *Oecologia* 110:191-196.
- 1997 Bosela, M.J. and F.W. Ewers. The mode of origin of root buds and root sprouts in the clonal tree, *Sassafras albidum* (Lauraceae). *American Journal of Botany* 84: 1466-1481.
- 1996 Sperry, J.S., N.Z. Saliendra, W.T. Pockman, H. Cochard, P. Cruziat, S.D. Davis, F.W. Ewers, M.T. Tyree. New evidence for large negative xylem pressures and their measurement by the pressure chamber method. *Plant, Cell & Environment* 19: 427-436.

- 1995 Owens, S.A., F.W. Ewers, S.L. Flegler, K.L. Klomparens. Architecture of cauliflory in the genus *Cercis* (Fabaceae: Caesalpinioideae). *Canadian Journal of Botany* 73: 1270-1282
- 1995 Fisher, J.B. and F.W. Ewers. Vessel dimensions in liana and tree species of *Gnetum* (Gnetales). *American Journal of Botany* 82: 1350-1357.
- 1995 Jarbeau, J.A., F.W. Ewers and S.D. Davis. The mechanism of water- stress-induced embolism in two species of chaparral shrubs. *Plant, Cell and Environment* 18: 189-196.
- 1994 Cochard, H., F.W. Ewers and M.T. Tyree. Water relations of a tropical vine-like bamboo (*Rhipidocladum racemiflorum*): root pressures, vulnerability to cavitation and seasonal changes in embolism. *Journal of Experimental Botany* 45:1085-1089.
- 1994 Hargrave, K.R., K.J. Kolb, F.W. Ewers and S.D. Davis. Conduit diameter and drought-induced embolism in *Salvia mellifera* Green (Labiatae). *New Phytologist* 126:695-705.
- 1994 Anton, L.H., F.W. Ewers, R.Hammerschmidt, and K.L.Klomparens. Mechanisms of deposition of epicuticular wax in leaves of broccoli, *Brassica oleracea* L. var. *capitata* L. *New Phytologist* 126:505-510.
- 1993 Chiu, S.-T. and F.W. Ewers. The effect of segment length on conductance measurements in *Lonicera fragrantissima*. *J. of Experimental Botany* 44:175-181.
- 1992 Chiu, S.-T. and F.W. Ewers. Xylem structure and water transport in a twiner, a scrambler, and a shrub of *Lonicera* (Caprifoliaceae). *Trees* 6:216-224.
- 1992 Ewers, F.W., G.B. North and P.S. Nobel. Root-stem junctions of a desert monocotyledon and dicotyledon: Hydraulic consequences under wet conditions and during drought. *New Phytologist* 121:377-385
- 1992 North, G.B., F.W. Ewers and P.S. Nobel. Main root-lateral root junctions of two desert succulents: Changes in axial and radial components of hydraulic conductivity during drying. *Amer. J. Bot.* 79:1039-1050.
- 1992 Chiu, S.-T., L.H. Anton, F.W. Ewers, R. Hammerschmidt, and K.S. Pregitzer. Effects of fertilization on epicuticular wax morphology of needle leaves of Douglas fir, *Pseudotsuga menziesii* (Pinaceae). *Amer. J. Bot.* 79:149-154.
- 1992 Fisher, J.B. and F.W. Ewers. Xylem pathways in liana stems with anomalous secondary growth. *Bot. Jour. Linn. Soc.* 180:181-202.
- 1991 Tyree, M.T. and F.W. Ewers. The hydraulic architecture of trees and other woody plants. *New Phytologist*, Tansley Review No. 34 119:345-360.
- 1991 Theurer, J.C., S. Owens, and F.W. Ewers. Anatomy of a new sepeloid mutant flower of sugarbeet. *Journal of Sugar Beet Research* 28:23-30.
- 1991 Owens, S. and F.W. Ewers. The development of cauliflory in redbud, *Cercis canadensis* (Fabaceae). *Can. J. Bot.* 69:1956-1963.
- 1991 Ewers, F.W. and Fisher, J.B. Why vines have narrow stems: histological trends in *Bauhinia*. *Oecologia* 88:233-237.
- 1991 Chang, L.S., Iezzoni, A., Adams, G. and F.W. Ewers. Hydraulic conductivity in peach clones tolerant or susceptible to *Leucostoma*. *J. Amer. Soc. Hort. Sci.* 116:831-834.
- 1990 Ewers, F.W., J.B. Fisher and S.-T. Chiu. A survey of vessel dimensions in stems of tropical lianas and other growth forms. *Oecologia* 84: 544-552.
- 1990 McManus, P.S. and F.W. Ewers. The effect of *Cryphonectria parasitica* on water

- relations of American chestnut. *Physiological and Molecular Plant Pathology* 36:461-470.
- 1989 McManus, P.S., F.W. Ewers and D.W. Fulbright. Characterization of the chestnut blight canker and the localization and isolation of the pathogen *Cryphonectria parasitica*. *Can. J. Bot.* 67:3600-3607.
- 1989 Fisher, J.B. and F.W. Ewers. Wound healing in stems of lianas after twisting and girdling injuries. *Bot Gaz.* 150:251-265.
- 1989 Ewers, F.W., P.S. McManus, A. Goldman, R. Gucci, and D.W. Fulbright. The effect of virulent and hypovirulent stains of *Endothia parasitica* on hydraulic conductance in American chestnut. *Can. J. Bot.* 67:1402-1407.
- 1989 Ewers, F.W., J.B. Fisher, and S.-T. Chiu. Water transport in the liana *Bauhinia fassoglensis* (Fabaceae). *Plant Physiology* 91:1625-1631.
- 1989 Ewers, F.W., J.B. Fisher. Techniques for measuring vessel lengths and diameters in stems of woody plants. *American Journal of Botany* 76:645-656.
- 1989 Ewers, F.W., J.B. Fisher. Variation in vessel length and diameter in stems of six tropical and subtropical lianas. *American Journal of Botany* 76: 1452-1459.
- 1987 Ewers, F.W. and R. Aloni. Seasonal secondary growth in needle leaves of *Pinus strobus* and *Pinus brutia*. *American Journal of Botany* 74:980-987.
- 1986 Ellmore, G.S. and F.W. Ewers. Fluid flow in the outermost xylem increment of a ring-porous tree, *Ulmus americana*. *Amer. J. Bot.* 73:1771-1774.
- 1985 Ellmore, G.S. and F.W. Ewers. Hydraulic conductivity in trunk xylem of elm, *Ulmus americana*. *I.A.W.A. Bulletin* 6:303-307.
- 1985 Ewers, F.W. Xylem structure and water conduction in conifer trees, dicot trees, and lianas. *I.A.W.A. Bulletin* 6:309-317.
- 1985 Ewers, F.W. and R. Aloni. The effect of applied auxin and gibberellin on xylem and phloem production in leaves of *Pinus*. *Bot. Gaz.* 146:466-471.
- 1985 Ewers, F.W. and R. Schmid. The fate of the dwarf shoot apex in bristlecone pine (*Pinus longaeva*). *Amer. J. Bot.* 72:509-513.
- 1984 Ewers, F.W. and M.H. Zimmermann. The hydraulic architecture of eastern hemlock (*Tsuga canadensis*). *Can. J. Bot.* 62:940-946.
- 1984 Ewers, F.W. and M.H. Zimmermann. The hydraulic architecture of balsam fir (*Abies balsamea*). *Physiol. Plant.* 60:453-458.
- 1983 Ewers, F.W. The determinate and indeterminate dwarf shoots of *Pinus longaeva* (bristlecone pine). *Can. J. Bot.* 61:2280-2290.
- 1982 Ewers, F.W. Secondary growth in needle leaves of *Pinus longaeva* (bristlecone pine) and other conifers: quantitative data. *Amer. J. Bot.* 69: 1552-1559.
- 1982 Ewers, F.W. Developmental and cytological evidence for mode of origin of secondary phloem in needle leaves of *Pinus longaeva* (bristlecone pine) and *P. flexilis*. *Bot. Jahrb. Syst.* 103: 59-88.
- 1981 Ewers, F.W. and R. Schmid. Longevity of needle fascicles of *Pinus longaeva* (bristlecone pine) and other North American pines. *Oecologia* 51:107-115