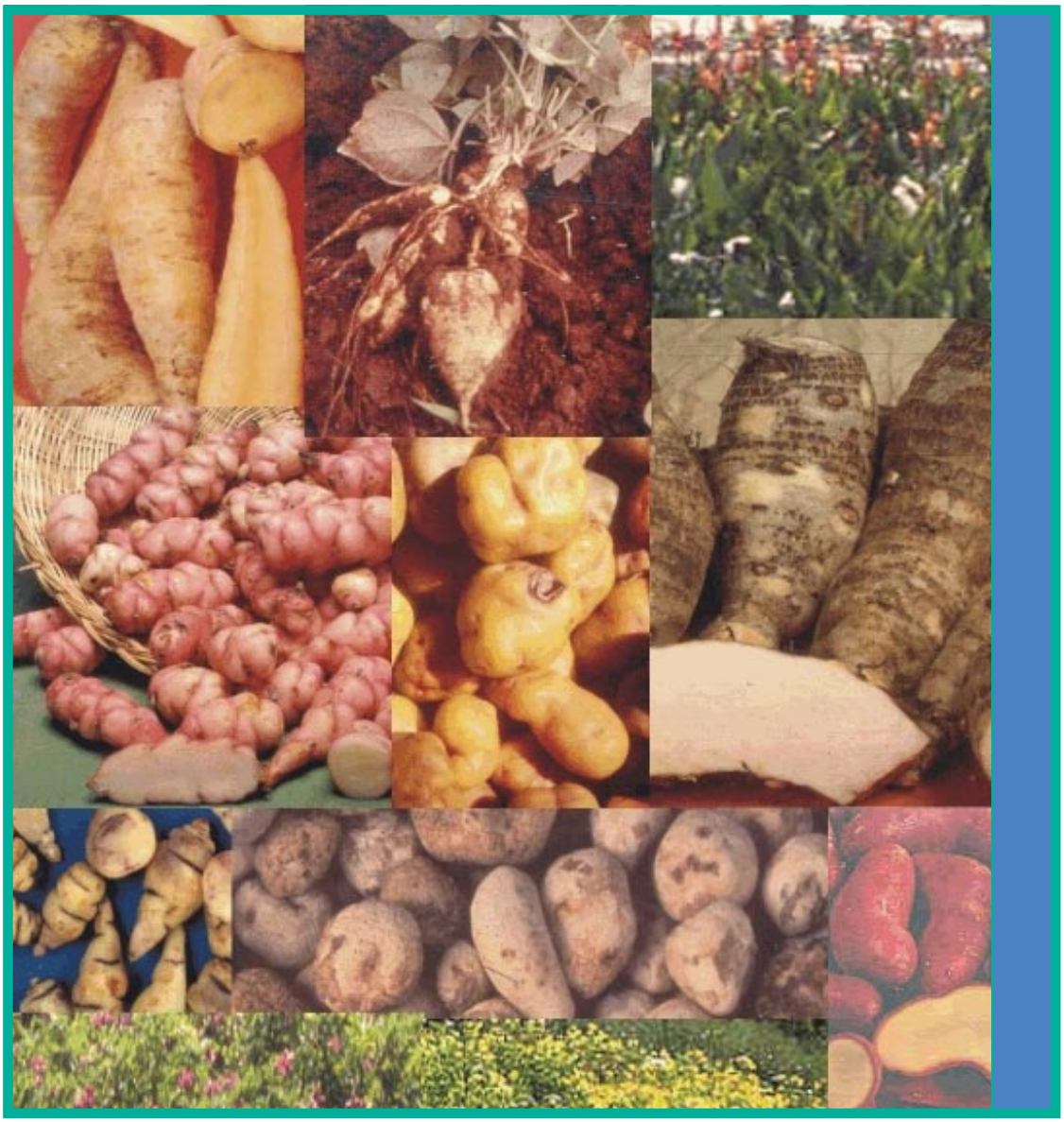
International Plant Genetic Resources Institute

Bibliography on
UNDERUTILIZED ROOTS AND TUBERS CROPS

Dimary Libreros, compiler



International Plant Genetic Resources Institute

Americas Group

Bibliography on

UNDERUTILIZED ROOTS AND TUBERS CROPS

compiled by
Dimary Libreros

Cali, Colombia, Abril 2001

Contents

Introduction iv

Plant Pathology 1

Plant Breeding 3

Plant Propagation 9

Taxonomy and Evolution 11

Crop Management and Production 17

Plant Physiology 21

Entomology 24

Roots and Tubers Chemical Composition 24

INTRODUCTION

Roots and tubers crops are present in the diet of people almost all over the world, the best known being the potato (*Solanum tuberosum* L.) and cassava (*Manihot esculenta* Crantz), both of which are of South American origin but are now widely distributed. The potato was domesticated in the Andean region, but there are several species of roots and tubers which originated there and which are still of importance to Andean people, such as yacon (*Polymnia sonchifolia* Poeppig & Endlicher), white carrot (*Arracacia xanthorrhyza* Brancrof.), mauka (*Mirabilis expansa* Ruiz & Pavón), maca (*Lepidium meyenii* Walp.), achira (*Canna edulis* Ker Grawler), oca (*Oxalis tuberosus* Molina), mashua (*Tropaeolum tuberosum* R. & P.) and ulluco (*Ullucus tuberosus* Lozano). These species are little known to farmers and investigators outside the Andean region, and even to some within the region. They are species that have perhaps not been fully exploited or whose potential has not been fully taken advantage of, possibly because their cultivation is restricted and their use localized. Some of these species have a nutritive value and other characteristics that make them very promising candidates for more extensive use. For example, oca and mashua have a high energy value, maca and white carrot contain high levels of iron and calcium, and the sugar content of yacón is so high that it has potential for agroindustrial alcohol production.

The results of the relatively limited research that has been carried out on these underutilized species by national and international agricultural research institutions, non-governmental organizations and universities is the starting point for future research. This bibliography is a compilation of such results, reflecting the state of knowledge on diverse research subjects and also what still needs to be done, for example in areas such as entomology and pathology.
The bibliography contains 451 references, with citation and Agrovoc descriptors. Records are organized in 8 subjects, that is taxonomy and evolution (102), chemical composition (50), crop management and production (66), plant propagation (50), plant pathology (32), plant physiology (41), entomology (7) and plant breeding (103).

We hope this bibliography will be a valuable tool for researchers and other professionals working with Andean root and tube crops. For further contributions and updates, please contact Ms. Dimary Libreros, Information Assistant, IPGRI-Americas Group, d.libreros@cgiar.org.

BIBLIOGRAPHY ON UNDEUTILIZED ROOTS AND TUBERS CROPS

PLANT PATHOLOGY

Agbor Egbe, T. and J.E. Rickard. 1991. Study on the factors affecting storage of edible aroids. Annals of Applied Biology 119(1):121-130. **Keywords:** Postharvest decay, environmental factors, storage, temperature, humidity, biodeterioration, plant pathology.

Agueguia, A. and O.U. Onokpise. 1990. Evaluation of cocoyam (*Xanthosoma sagittifolium*) clones for root rot blight complex resistance. Indian Journal of Genetics and Plant Breeding 50(3):216-220**. Keywords:** Disease resistance, plant breeding, plant pathology, plant pathogenic fungi.

Agueguia, A., C.A. Fatokun., S.K. Hahn and F. Ofori. 1994. The genetics of resistance to cocoyam root rot blight complex disease in *Xanthosoma sagittifolium* (L.) Schott. Tropical root crops in a developing economy held at Accra, Ghana, 20-26 October 1991. Acta Horticulturae No. 380:438-442. **Keywords:** Root vegetables, hybrids, disease resistance, plant diseases, plant pathogenic fungi, genetic variance, varietal reactions.

Atkey, P.T. and A.A. Brunt. 1982. The occurrence of mycoplasma like bodies in severely diseased oca plants from Bolivia. Phytopathologische Zeitschrift 103:294-300. **Keywords:** Diseases, *Oxalis tuberosa*, Bolivia.

Bolle, M.F.C.d., R.W. Osborn., I.J. Goderis., L. Noe., D. Acland., C.A. Hart., S. Torrekens., F.v. Leuven., W.F. Brockaert., M.F.C. De Bolle and F. Van Leuven. 1996. Antimicrobial peptides from *Mirabilis jalapa* and *Amaranthus caudatus*: expression, processing, localization and biological activity in transgenic tobacco. Plant Molecular Biology 31(5):993-1008. **Keywords:** Genetic engineering, disease resistance, transgenic plants, pathogenesis, proteins, biotechnology, stimulant plants.

Broschat, T.K., J.A. Reinert and H.M. Donselman. 1983. Resistance of *Canna* cultivars to canna rust and *Hippeastrum* mosaic. HortScience 18(4):451-452. **Keywords:** Cultivars, diseases, plant pathogenic fungi.

Fuglie, K.O., L. Zhang., L. Salazar and T. Walker. 1997. Economic impact of virus-free sweet potato planting material in Shandong Province, China. Impact on a changing world. International Potato Center, Program Report. **Keywords:** Sweet potatoes, seed potatoes, economic impact, economic evaluation.

Gollifer, D.E., G.V.H. Jackson., A.J. Dabek., R.T. Plumb and Y.Y. May. 1977. The occurrence and transmission of viruses of edible aroids in the Solomon Islands and the Southwest Pacific. Pans 23(2):171-177. **Keywords:** Hosts, transmission, polyploidy, plant introduction, sugar crops, plant pathology.

Gomez, L., M. Monge., R. Valverde., O. Arias and T. Thorpe. 1989. Micropropagation of 3 virus-free edible aroids. Turrialba 39(2): 155-161. **Keywords:** Micropropagation, tissue culture, corms, Benzyladenine, biotechnology, *in vitro* culture, plant growth regulators, plant pathology.

Habuka, N., M. Miyano., J. Kataoka., H. Tsuge., H. Ago and M. Noma. 1991. Substantial increase of the inhibitory activity of *Mirabilis* antiviral protein by an elimination of the disulfide bond with genetic engineering. Journal of Biological Chemistry 266(35):23558-23560. **Keywords:** Medicinal plants, ornamental herbaceous plants, molecular genetics, plant extracts, plant pathology.

Hahn, S.K., J.C.G. Isoba and T. Ikotun. 1989. Resistance breeding in root and tuber crops at the International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria. Crop Protection 8(3):147-168. **Keywords:** Varietal susceptibility, insect pests, pest resistance, cassava, sweet potatoes, yams, plant nematology, pest control, plant pathogenic bacteria, plant pathology.

Hashidoko, Y., M. Urashima., T. Yoshida and J. Mizutani. 1993. Decarboxylative conversion of hydroxycinnamic acids by *Klebsiella oxytoca* and *Erwinia uredovora*, epiphytic bacteria of *Polymnia sonchifolia* leaf, possibly associated with formation of microflora on the damaged leaves. Bioscience, Biotechnology and Biochemistry 57(2):215-219. **Keywords:** Diseases, host parasite relationships, fodder plants, plant pathology.

Hibberd, A.M., G. Piperidis and I.D. Godwin. 1996. The hypersensitive reaction to bacterial canker in *Mirabilis jalapa* is simply inherited. Australasian Plant Pathology 25(1):64-67. **Keywords**: Plant diseases, plant pathogens, plant pathogenic bacteria, medicinal plants, disease resistance, genetics, weeds, biology.

Ikeda, T., Y. Takanami., S. Imaizumi., T. Matsumoto., Y. Mikami and S. Kubo. 1987. Formation of anti-plant viral protein by *Mirabilis jalapa* L. cells in suspension culture. Plant Cell Reports 6(3):216-218. **Keywords:** Tissue culture, antiviral properties, plant extracts, ornamental plants, ornamental bulbs, pesticidal plants, plant pathology.

Jackson, G.V.H. 1990. Pathogen-free Pacific taro. FAO Plant Protection Bulletin 38(3):145-150. **Keywords:** Diseases, tissue culture, disease resistance, pathogens, plant pathology.

Jones, R.A.C. and R.H. Kenten. 1981. A strain of arracacha virus B infecting oca (*Oxalis tuberosa*: Oxalidaceae) in the Peruvian Andes. (Phytopathologische Zeitschrift 100: 88-95. **Keywords:** *Arracacia xanthorrhiza*, viruses, diseases, white carrot, oca.

Jones, R.A.C. and R.H. Kenten. 1978. Arracacha virus A: A newly recognize virus infecting arracacha (*Arracacia xanthorrhiza*; Umbelliferae) in the Peruvian Andes. Annals of Applied Biology 93:31-36. **Keywords:** Viruses, white carrot, diseases, Peru, plant pathology.

Kubo, S., T. Ikeda., S. Imaizumi., Y. Takanami and Y. Mikami. 1990. A potent plant virus inhibitor found in *Mirabilis jalapa* L. Annals of the Phytopathological Society of Japan 56(4):481-487. **Keywords:** Plant extracts, antiviral agents, inhibition, elisa, detection, biotechnology, plant pathology.

Liu, L.J., M. Licha., D. Baella and E. Rosa. 1982. Variations in morphology and mosaic virus resistance in plantlets of taniers (*Xanthosoma* sp.) via tissue culture. Phytopathology 72(7):990. **Keywords:** Tissue culture, root crops.

Lizarraga, C., M. Santa Cruz., L.F. Salazar and M.S. Cruz. 1996. First report of potato leafroll luteovirus in ulluco (*Ullucus tuberosus* Caldas). Plant Disease 80(3):344. **Keywords:** Plant diseases, plant pathogens, new host records, records, hosts, disease resistance, root crops, plant genetic resources, plant pathology.

Lockhart, B.E.L. 1990. Evidence for a double-stranded circular DNA genome in a second group of plant viruses. Phytopathology 80(2):127-131. **Keywords:** Biotechnology, DNA, molecular genetics, plant pathology.

Nakanishi, T. and T. Sato. 1997. Differences in resistance to bacterial wilt caused by *Erwinia chrysanthemi* among yacon clones (*Polymnia sonchifolia* Poepp. & Endl). Bulletin of the Shikoku National Agricultural Experiment Station No. 61:149-157. **Keywords:** Plant diseases, plant pathogens, plant pathogenic bacteria, plant disease control, disease resistance.

Ohazurike, N.C. and A.E. Arinze. 1996. Changes in phenol oxidase and peroxidase levels in cocoyam tubers of different postharvest ages infected by *Sclerotium rolfsii* Sacc. Nahrung 40(1): 25-27. **Keywords:** Plant diseases, plant pathogens, plant composition, disease resistance, physiology, postharvest decay, resistance, enzymes, root crops.

Onuegbu, B.A. 1999. Composition of four cocoyam cultivars and their tolerance of corm rot. Tropical Science 39(3):136-139. **Keywords:** Corms, cultivars, plant diseases, plant pathogens, disease resistance, biochemistry, varietal reactions, root crops, control, plant pathology.

Pacumbaba, R.P., J.G. Wutoh and M.M.B. Meboka. 1992. Protocol to screen cocoyam accessions for resistance or tolerance to cocoyam root rot disease in Cameroon. Plant Disease 76(8): 768-770. **Keywords:** Screening, techniques, root crops, disease resistance, plant pathology, plant pathogenic fungi.

Smit, N. 1989. Root crop production in Tonga. Technical Bulletin Ministry of Agriculture, Fisheries and Forests, Tongan German Plant Protection Project No. 1079 pp. **Keywords:** Control, pathogenicity, plant parasitic nematodes, root crops, potatoes, sweet potatoes, cassava, yams, nematology, plant pathology.

Thankappan, M. 1993. Tuber crops are vulnerable to viruses. Indian Horticulture 38(3):25-26. **Keywords:** Plant diseases, plant pathogens, plant disease control, root crops, cassava, sweet potatoes, yams, plant pathology.

Vivanco, J.M., B.J. Savary and H.E. Flores. 1999. Characterization of two novel type I ribosome-inactivating proteins from the storage roots of the andean crop *Mirabilis expansa*. Plant Physiology 119(4):1447-1456. **Keywords:** Root crops, plant pathogens, plant pathogenic fungi, plant composition, plant pathogenic bacteria.

Volin, R. 1980. Selecting for resistance to dasheen mosaic virus (DMV) among seedling cocoyam plants. IITA Research Briefs 1(1): 3-4. **Keywords:** Techniques, plant pathology.

Wutoh, J.G., J.T. Tambong., M.M. Meboka., S. Nzietchueng., F. Ofori and S.K. Hahn. 1994. Field evaluation of cocoyam (*Xanthosoma sagittifolium* (L) Schott) for tolerance to the root rot disease caused by *Pythium myriotylum*. Tropical root crops in a developing economy held at Accra, Ghana, 20-26 October 1991. Acta Horticulturae. 1994, No. 380:462-466. **Keywords:** Plant pathogens, plant diseases, plant pathogenic fungi, disease resistance, varietal reactions.

Xie, Y. and Y.P. Xie. 1999. Study on inoculation methods for testing resistance of sweet potato varieties to root rot in the laboratory. Plant Protection 25(6):7-9. **Keywords:** Sweet potatoes, vermiculite, culture media, plant diseases, disease resistance, plant pathogens.

Zettler, F.W., G.V.H. Jackson and E.A. Frison. 1989. FAO/IBPGR technical guidelines for the safe movement of edible aroid germplasm. IBPGR, Rome, Italy. 24 p. **Keywords:** Germplasm, movement, genetic resources, insect pests, quarantine, pests, root crops, plant nematology, agricultural entomology, plant pathology, plant genetic resources.

PLANT BREEDING

Acheampong, E., G.G. Henshaw., E.R. Terry., E.V. Doku., O.B. Arene and N.M. Mahungu. 1984. *In vitro* methods for cocoyam improvement. Tropical Root Crops: Production and Uses in Africa. 165-168. **Keywords:** Tissue culture, plan breeding.

Acheampong, E., F. Ofori and S.K. Hahn. 1994. *In vitro* preservation of cocoyam germplasm under reduced temperature and light conditions. *In* Tropical root crops in a developing economy. Ghana, 20-26 October 1991. Acta Horticulturae No. 380:443-447. **Keywords:** Root vegetables, germplasm, plant genetic resources, temperature, *in vitro* culture.

Agueguia, A., S. Nzietchueng., E.R. Terry., E.V. Doku., O.B. Arene and N.M. Mahungu. 1984. Production of hybrid *Xanthosoma sagittifolium* and test for resistance to *Pythium myriotylum*. Tropical Root Crops: Production and Uses in Africa. 169-171. **Keywords:** Growth regulators, gibberellic acid, flowering, induction, flowers, pollination, plant growth regulators, plant breeding.

Agueguia, A. 1993. Association of metric traits and path analysis in cocoyam, *Xanthosoma sagittifolium* (L.) Schott. Indian Journal of Genetics and Plant Breeding 53(3):287-291. **Keywords:** Yield components, leaf area, dry matter, corms, crop yield, yields, path analysis, yield correlations, root crops.

Ahmed, G. and M.M. Rashid. 1975. A comparative study of the gross morphological characters and the yield potentialities of the major types of edible aroids of Bangladesh. Bangladesh Horticulture 3(1):15-21. **Keywords:** Cultivars, sugar crops, crop management.

Arevalo, T.A., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. Performance of cultivars of the genus *Pachyrhizus* DC in Ecuador. Proceedings of 2nd International Symposium on Tuberous Legumes Guanajuato, Mexico, 5-8 August 1996. 1998, 115-125. **Keywords:** Experimental plots, genetic erosion, marketing, pests, variety trials, evaluation, root crops, plant genetic resources.

Benavides, A.S. 1976. Variabilidad clonal en ulluco (*Ullucus tuberosus* Loz.). Fitotécnia Latinoamericana 4(2):91-98. **Keywords:** Genetic variability, *Ullucus*.

Boom, B.M. 1989. Use of plant resources by the Chácobo. Adv. Econ. Bot. 7:78-96. **Keywords:** Bolivia, Amazon, rain forest, *Manihot esculenta*, maize, *Dioscorea trifida*, yam, sweet potato, *Ipomoea batatas*, *Xanthosoma*, fruit, medicinal.

Briceno Vergara, A. 1975. Preliminary results on the introduction of clonal material of *Arracacia xanthorrhiza* Banc into the Venezuelan Andes. Agronomia Tropical 25(1):31-37. **Keywords:** Variety trials, sugar crops, *Arracacia xanthorrhiza*.

Castillo, R., C. Tapia., J. Estrella., N. Mazon., L. Munoz., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. The *Pachyrhizus* project in Ecuador: technical report. Proceedings of 2nd International Symposium on Tuberous Legumes Guanajuato, Mexico, 5-8 August 1996. 1998, 19-29. **Keywords:** Collecting missions, tissue culture, conservation, gene banks, wild relatives, genetic resources, germplasm, root crops.

Castillo T., R. 1991. Análisis preliminar sobre los recursos fitogenéticos en el Ecuador. Pp. 3-12 *In* Las plantas y el hombre. (M. Ríos and H. Borgtoft, Pedersen (eds.)). Ediciones Abya-Yala, Quito, Ecuador. **Keywords:** Ecuador, germplasm, accession numbers, *ex situ* conservation, collection, *Phaseolus*, *Pachyrhizus*, *Ullucus*, *Arracacia*, *in vitro* conservation.

Chadha, K.L. and G.G. Nayar. 1994. Advances in horticulture: tuber crops. Using Smart Source Parsing. Volume 8. 714 p. **Keywords:** Cassava, sweet potatoes, yams, plant genetic resources, plant breeding, crop husbandry, fungal diseases, viral diseases, pests, chemical composition, storage, drying, handling, processing, root crops.

Chemarin, N.G., A.N. Glazurina and I.A. Zabelin. 1973. The uses of ionizing radiation in *Canna* breeding. Byulleten' Gosudarstvennogo Nikitskogo Botanicheskogo Sada No.1(20):52-57. **Keywords:** Mutants, induction, gamma radiation, irradiation, ornamental plants, ornamental herbaceous plants.

Chen, F., X. Chen., Z. Yuan., B. Zhuang., F.X. Chen., X.Y. Chen., Z.N. Yuan and B.H. Zhuang. 2000. Advances in sweet potato breeding in Fujian and its prospects. Journal of Fujian Agricultural University 29(1):7-11. **Keywords:** Sweet potatoes, reviews, plant breeding, breeding methods, quality, root crops.

Crombie, H.J., S. Chengappa., A. Hellyer and J.S.G. Reid. 1998. A xyloglucan oligosaccharide-active, transglycosylating beta-D-glucosidase from the cotyledons of nasturtium (*Tropaeolum majus* L) seedlings - purification, properties and characterization of a cDNA clone. Plant Journal 15(1): 7-38. **Keywords:** Complementary DNA, cotyledons, seedlings, beta glucosidase, xyloglucans, nucleotide sequences, enzymes, ligosaccharides, biochemistry, hydrolysis, amino acid sequences, *Barley*, gene expression, ornamental plants, biotechnology.

Damania, A.B. and J.T. Williams. 1980. Directory of germplasm collections. II Root crops. IBPGR. Rome, Italy. **Keywords:** Potatoes, gene banks, cereals, yams.

De Azkue, D. 1984. Variación del cariotipo, volumen nuclear y contenido de AND en siete especies de *Oxalis*. Darwiniana 25(1-4):267-277. **Keywords:** *Oxalis*, DNA, caryotipo.

De Azkue, D. and A. Martínez. 1990. Chromosome number of the *Oxalis tuberosa* alliance (Oxalidaceae). Plant Systematic Evolution 169:25-29. **Keywords:** Angiospermae, Oxalidaceae, *Oxalis tuberosa*, genetics.

Debouck, D.G. 1994. Introduction to the conservation of genetic resources of American tuber legumes *(Pachyrhizus)*. Pp. 5-17 *In* Proceedings of the First International Symposium on Tuberous Legumes. Guadeloupe, F.W.I., 21-24 April 1992. (M. Sorensen (eds.)). DSR Tryk, Copenhagen, Denmark. **Keywords:** *Pachyrhizus ahipa*, yam bean, wild species, cultivated species, germplasm conservation, *Pachyrhizus tuberosus*, jicama.

Delool, R.A.H. and R.A.E. Tilney Bassett. 1984. The inheritance of the mutable variegated leaf in *Mirabilis jalapa* L. Euphytica 33(1):169-176. **Keywords:** Leaves, variegation, genetics, ornamental plants, ornamental bulbs.

Doygaard, S., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. Principal component analysis of morphological characters in the genus *Pachyrhizus* DC. Proceedings of 2nd International Symposium on Tuberous Legumes. Guanajuato, Mexico, 5-8 August 1996. 1998, 33-42. **Keywords:** Morphology, principal component analysis, multivariate analysis, quantitative traits, root crops, plant genetic resources.

Engels, J.M., W.N.M.v. Kester., C.J.T. Spitters., L. Vosselman and A.C. Zeven. 1975. Investigations of the inheritance of flower variegation in *Mirabilis jalapa* L. 1. General introduction and 2. Inheritance of colour in uniformly coloured flowers. Euphytica 24(1):1-5. **Keywords:** Breeding, flowers, colour, ornamental plants, ornamental bulbs, selection.

Esnard, J., F. Ferwerda., E. Rivera Amador and P.R. Hepperly. 1993. Induction of tetraploidy in the tanier cultivar 'Inglesa' (*Xanthosoma sagittifolium* (L.) Schott). Plant Breeding 111(4):335-338. **Keywords:** Root vegetables, *in vitro* culture, shoot tip culture, plant growth regulators, aneuploidy, culture media, polyploidy.

Estrella, J., S. Phillips., R. Abbott., A. Gillies., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. Genetic variation and relationships in agronomically important species of yam bean (*Pachyrhizus* DC.) based on RAPD markers. Proceedings of 2nd International Symposium on Tuberous Legumes. Guanajuato, Mexico, 5-8 August 1996. 1998, 43-59. **Keywords:** Cultivar identification, variety classification, genetic erosion, polymerase chain reaction, multivariate analysis, random amplified polymorphic DNA, plant genetic resources, biotechnology.

Feofilova, G.F., A.A. Gostev., T.A. Sholokhova and I.A. Mudrik. 1990. Cytogenetic basis of *Canna* breeding. Byulleten' Gosudarstvennogo Nikitskogo Botanicheskogo Sada No. 71:113-115. **Keywords:** Interspecific hybridization, chromosome number, chromosome morphology, triploidy, karyotypes.

Fernandez, C.E. and L. Kucera. 1997. Determination of number of chromosomes in select ecotypes of yacon (*Polymnia sonchifolia* Poeppig and Endlicher) cultivated *in vitro*. Agricultura Tropical et Subtropical No. 30: 89-93. **Keywords:** *In vitro* culture, chromosome number, vegetables.

Foster, R.C. 1958. A catalogue of the ferns and flowering plants of Bolivia. Contr. Gray Herb. Harvard Univ. 1841-223. **Keywords:** Flora, floristic survey, plant inventory, *Phaseolus*, *Pachyrhizus*, *Macroptilium*, *Vigna*.

Galwey, N.W. and J.R. Risi Carbone. 1983. Grain and tuber crop collecting in the Andes. Plant Genetic Resources Newsletter No. 55:17-20. **Keywords:** Maps, genetic resources.

Gandarillas Santa Cruz, H. and J. Luizaga. 1967. Número de cromosomas de la papalisa (*Ullucus tuberosus* Caldas. Sayana 5(2):8-9. **Keywords:** Genetics, ADN, plant breeding.

Gibbs, P.E. 1976. Studies on the breeding system of *Oxalis tuberosa* Mol. Flora. 165: 129-138. **Keywords:** Plant breeding, oca.

Gibbs, P.E., Marshall, D/. Brunton, D. 1978. Studies on the cytology of *Oxalis tuberosa* and *Tropaeolum tuberosum.* Notes from the Royal Botanical Garden od Edinburgh. 37: 215-220. **Keywords:** Cytology, Chromosomes, ADN, oca, mashua.

Giordano, L.d.B., F.F. Santos., G.P. Henz and A.W. Moita. 1995. Evaluation of *Arracacia xanthorrhiza* clones originating from botanical seeds in the Distrito Federal. Horticultura Brasileira 13(2):188-191. **Keywords:** Plant breeding, performance testing, true seeds.

Goenaga, R. and P. Hepperly. 1990. Flowering induction, pollen and seed viability and artificial hybridization of taniers (*Xanthosoma* spp.). Journal of Agriculture of the University of Puerto Rico 74(3):253-260. **Keywords:** Root crops, flowering, pollination, hybrid seed production, breeding, germination, storage, viability, plant growth regulators.

Grubben, G.J.H. 1977. Other warm weather vegetables (okra, sweet corn, palm cabbage, bamboo, arracacha, mushrooms). Grubben, G. J. H. Tropical vegetables and their genetic resources. **Keywords:** Vegetables, variation, plant collections, maize, breeding.

Grum, M., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. *Pachyrhizus* DC (yam bean) symbiosis with *Rhizobium* bacteria: genetic variation and performance. Proceedings of 2nd International Symposium on Tuberous Legumes. Guanajuato, Mexico, 5-8 August 1996. 1998, 419-429. **Keywords:** Genetic variation, symbiosis, nitrogen fixing bacteria, nodulation, crop yield.

Hahn, S.K., F.S. Shideler and H. Rincon. 1983. Progress on root and tuber improvement at IITA. Proceedings: sixth symposium of the International Society for Tropical Root Crops, Lima, Peru. 55-58. **Keywords:** Root crops, breeding.

Heredia, Z.A., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1996. Selection of advanced generations of interspecific crosses of the genus *Pachyrhizus* DC. Proceedings of 2nd International Symposium on Tuberous Legumes, Celaya, Guanajuato, Mexico. 343-350. **Keywords:** Characteristics, interspecific hybridization, sexual reproduction, breeding, root crops, plant genetic resources.

Ibrahim, M.N.M., S. Raveendranath and S. Balasubramaniam. 1983. Studies on root and tuber crops grown in association with coconut. 1. Survey on root and tuber crops found under coconut and the morphological characterization of edible aroids. Cocos No.1:17-30. **Keywords:** Intercropping, coconuts, root crops, tropics, identification, oilseed plants, yams.

International Board for Plant Genetic, R. and U. Netherlands Agricultural. 1988. *In vitro* storage of *Colocasia*, *Xanthosoma* and *Cryptocoryne* germplasm. IBPGR Report 88-96. **Keywords:** Genetic resources, root vegetables, gene banks, *in vitro* culture, techniques.

Jackson, G.V.H. and I.D. Firman. 1987. Characterization and preliminary evaluation of root crop germplasm in the South Pacific with special reference to pests and diseases. Newsletter, IBPGR Regional Committee for Southeast Asia Special Issue. 19-23. **Keywords:** Root crops, genetic resources, sweet potatoes, yams, cassava.

Jimenez, F. 1977. Performance of vegetables at Mayaguez, Puerto Rico during the rainy season-1976. Vegetables for the Hot, Humid Tropics No. 2: 18-29. **Keywords:** Cabbages, Chinese cabbages, kohlrabi, okras, cucumbers, varieties, vegetables.

Jokela, P. and L. Pietila. 1987. Collecting minor tuber crops in the Andes. Plant Genetic Resources Newsletter No. 7: 2-37. **Keywords:** Maps, genetic resources, root crops.

Jordan Molero, F.L. 1979. Preliminary work with tanier (*Xanthosoma* spp.) hybridization in Puerto Rico. Journal of Agriculture of the University of Puerto Rico 63(4):469-473. **Keywords:** Flowering, germination, hybridization.

Kalin Arroyo, M.T. 1981. Breeding systems and pollination biology in Leguminosae. Pp. 723-769 *In* Advances in legume systematics. (R.M. Polhill and P.H. Raven (eds.)). Royal Botanic Gardens, Kew, England. **Keywords:** Plant breeding, *Phaseolus coccineus*, self-compatibility, *Pachyrhizus*.

Karikari, S.K., E.H. Belen and M. Villanueva. 1982. Preliminary evaluation of 14 Puerto Rican and six Ghanaian varieties of cocoyam (*Colocasia* and *Xanthosoma* spp.) under Ghanaian conditions. 5th International symposium on tropical root and tuber crops. **Keywords:** Cultivars, *Colocasia, Xanthosoma*.

Kataoka, J., N. Habuka., M. Furuno., M. Miyano., Y. Takanami and A. Koiwai. 1991. DNA sequence of *Mirabilis* antiviral protein (MAP), a ribosome-inactivating protein with an antiviral property, from *Mirabilis jalapa* L. and its expression in *Escherichia coli*. Journal of Biological Chemistry 266(13):8426-8430. **Keywords:** Biotechnology, medicinal plants, antiviral properties, ornamental herbaceous plants, molecular genetics, nucleotide sequences, disease resistance.

Kataoka, J., N. Habuka., M. Miyano., C. Masuta and A. Koiwai. 1992. Adenine depurination and inactivation of plant ribosomes by an antiviral protein of *Mirabilis jalapa* (MAP). Plant Molecular Biology 20(6):1111-1119. **Keywords:** Biotechnology, medicinal plants, molecular genetics, nucleotide sequences, ribosomal DNA, tobacco.

Kataoka, J., M. Miyano., N. Habuka., C. Masuta and A. Koiwai. 1993. A genomic gene for MAP, a ribosome-inactivating protein from *Mirabilis jalapa*, contains an intron. Nucleic Acids Research 21(4): 1035. **Keywords:** Biotechnology, medicinal plants, ornamental herbaceous plants, molecular genetics, nucleotide sequences.

Kester, W.N.M.v., C.J.T. Spitters., L. Vosselman., J.M.M. Engels and A.C. Zeven. 1975. Investigations of the inheritance of flower variegation in *Mirabilis jalapa* L. 3. Somatic chromosome number, 4. Distribution of the pigments and 5. Chromatographic studies. Euphytica 24(1):6-12. **Keywords:** Genetics, flowers, pigments, ornamental plants, ornamental bulbs.

Khalaburdin, A.P. 1991. Effect of gamma radiation from 60Co on changes in some biological and morphological traits in hybrid *Canna*. Genetiko selektsionnye issledovaniya 158-167. **Keywords:** Gamma radiation, breeding, plant height, variegation, flowers, seed production, irradiation, seeds, development, mutants, induction, radiation, ornamental plants, ornamental bulbs.

Labord, J.A. 1972. First varieties of jicama (*Pachyrhizus erosus*). Tropical Root and Tuber Crops Newsletter No. 6: 42. **Keywords:** Varieties, vegetables.

Larkka, J., P. Jokela., L. Pietila and Y. Viinikka. 1992. Karyotypes and meiosis of cultivated and wild ulluco (*Ullucus tuberosus*). Caryologia 45(3-4):229-235. **Keywords:** Karyotypes, meiosis, wild plants, plant genetic resources, chromosome morphology.

Lawrence, T., J. Toll and D.H.v. Sloten. 1986. Directory of germplasm collections. 2. Root and tuber crops. 2. IBPGR. Rome, Italy. **Keywords:** Gene banks, root crops, genetics, cassava, potatoes, sweet potatoes, yams.

León, J. 1992. Los recursos fitogenéticos del Nuevo Mundo. Pp. 3-22 *In* Cultivos Marginados: Otra Perspectiva de 1492. (E. Hernández Bermejo and J. León (eds.)). Food and Agriculture Organization of the United Nations, Rome, Italy. **Keywords:** *Pachyrhizus ahipa*, jicama, *Amaranthus*, *Passiflora*, *Annona*, *Manihot*, Sapotaceae, *Anacardium*, *Spondias*.

Marks, G.E. 1956. Chromosome number in the genus *Oxalis*. New Phytol. 55(1):120-129. **Keywords:** Cytogenetics, *Oxalis.*

Martinez, A.B., J.J. Castillo Mont., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. Preliminary evaluation of 18 cultivars of jicama (*Pachyrhizus* DC.) in the valley of the Ciudad de Guatemala. Proceedings of 2nd International Symposium on Tuberous Legumes, Guanajuato, Mexico, 5-8 August 1996. 175-180. **Keywords:** Flowering, germplasm, growth period, productivity, evaluation, characterization, variety trials.

Mathew, P.M. 1958. Cytology of Oxalidaceae. Cytologia 23: 200-210. **Keywords:** Oxalis, caryology, wild species, *Averrhoa carambola*, *Oxalis tuberosa*.

Nagl, W., B. Knapp and O. Bill. 1991. The complex satellite DNA of *Tropaeolum majus* L. partial characterization of isolated and of cloned restriction fragments. Annals of Botany 67(4):347-355. **Keywords:** Biotechnology, ornamental herbaceous plants, ribosomal DNA, restriction mapping, restriction fragment length polymorphism.

Nair, S.G. and S. Abraham. 1989. Improvement of tuber yield in yam bean by mutation induction. Mutation Breeding Newsletter No. 34:20. **Keywords:** Root vegetables, tubers, genetic resources, gamma radiation, induced mutations, yields, root crops.

Nair, S.G. and S. Abraham. 1989. Spectrum of mutations induced by gamma rays and ethylmethane sulphonate in yam bean (*Pachyrrhizus erosus* Linn.). Journal of Root Crops 15(1):7-13. **Keywords:** Beans, root vegetables, induced mutations, morphology, mutagens, gamma radiation, ethyl methanesulfonate, vegetables.

Nair, S.G. and S. Abraham. 1990. EMS induced dwarf and high yielding mutant in yam bean (*Pachyrhizus erosus* Linn.). Mutation Breeding Newsletter No. 36:5-6. **Keywords:** Plant height, yields, protein content, induced mutations, ethyl methanesulfonate.

Nair, S.G. and S. Abraham. 1992. Quality improvement in yam bean (*Pachyrrhizus erosus* L.) by mutation induction. Mutation Breeding Newsletter No. 39:10-11. **Keywords:** Quality, induced mutations, starch, proteins, ethyl methanesulfonate.

Nielsen, P.E., M. Halafihi., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. Germplasm evaluation of *Pachyrhizus tuberosus* (Lam.) Spreng. Proceedings of 2nd International Symposium on Tuberous Legumes Guanajuato, Mexico, 5-8 August 1996. 1998, 253-259. **Keywords:** Evaluation, dry matter, root crops, quality, variety trials.

Noda, H., C.R. Bueno and F.D. Silva. 1991. Genetic erosion threatens native Amazonian vegetable crops. Diversity 7(1-2):62-63. **Keywords:** Vegetables, fruit crops, genetic resources, genetic erosion, plant genetic resources.

Nomura, K., K. Yoneda., H. Uchiyama and T. Koyama. 1999. Comparison of growth characteristics among several species of *Canna* spp. Japanese Journal of Tropical Agriculture 43(2):97-102. **Keywords:** Apical dominance, differentiation, flowering, growth analysis, plant development, rhizomes, genetics, plant morphology, ornamental plants.

Orting, B., W.J. Gruneberg., A. Grau., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. Status of ahipa (*Pachyrhizus ahipa* (Wedd.) Parodi) in Bolivia and northwestern Argentina. Proceedings of 2nd International Symposium on Tuberous Legumes. Guanajuato, Mexico, 5-8 August 1996. 1998, 73-93. **Keywords:** Plant breeding, evaluation, genetic analysis, germplasm, surveys, collecting missions.

Orting, B., W.J. Grüneberg and M. Sørensen. 1996. Ahipa (*Pachyrhizus ahipa* (Wedd.) Parodi) in Bolivia. Genet. Resources & Crop Evolution. 43(5):435-446. **Keywords:** Landraces, genetic variation, conservation, surveys, genetic resources, collecting missions.

Paiva, W.O.d. and W.O. De Paiva. 1993. Characterization and evaluation of edible aroids in the state of Amazonas. Acta Amazonica 23(2-3):115-123. **Keywords:** Variety trials, yields, nutritive value.

Pinto Cortes, B. 1970. Cultivation of *Pachyrhizus erosus.* Novedades Horticolas 15(1-4): 31-34. **Keywords:** Breeding, vegetables.

Plucknett, D.L. and N.W. Simmonds. 1976. Edible aroids. *Alocasia*, *Colocasia*, *Cyrtosperma*, *Xanthosoma*. Evolution of Crop Plants 10: 12. **Keywords:** Breeding, sugar crops.

Prain, G., J. Schneider., C. Widiyastuti., C. Almekinders and W.d. Boef. 2000. Farmers' maintenance of sweet potato diversity in Irian Jaya. Encouraging diversity: the conservation and development of plant genetic resources. Intermediate Technology Publications, London; UK. 54-59p. **Keywords:** Sweet potatoes, biodiversity, farm management, new variety, plant breeding, case studies, farmers' attitudes.

Quinones, V. and N. Moreno. 1996. Evaluation of eight cultivars of *Xanthosoma sagittifolium* Schott in Barinas state, Venezuela. Revista Unellez de Ciencia y Tecnologia, Produccion Agricola 14(2):44-54. **Keywords:** Cultivars, variety trials, yields, stability.

Ramachandran, K. 1978. Cytological studies on south Indian Araceae. Cytologia 43(2):289-303. **Keywords:** Chromosome number, sugar crops.

Sanchez, I., M. Milian., A. Morales., F.d.l. Puente and F. De la Puente. 1995. Search for genetic resources of tropical root and tuber crops in Cuba in 1991. Cultivos Tropicales 16(1):84-87. **Keywords:** Maps, collecting missions, cassava, sweet potatoes, gene banks, yams.

Sanchez Nieva, F. 1977. A comparison of the processing characteristics of three tanier cultivars. Journal of Agriculture of the University of Puerto Rico 61(3):337-344. **Keywords:** Food processing quality, sugar crops.

Santos, F.F.d. and J.B. Spina. 1997. International bibliography on Peruvian carrots (*Arracacia xanthorrhiza* Bancroft). EMBRAPA-CNPH; Brasilia, Distrito Federal; Brazil. 57 p. **Keywords:** Agronomy, botany, physiology, plant diseases, pests, genetics, breeding, food processing, economics, bibliographies, root crops.

Schnell, R.J., R. Goenaga and C.T. Olano. 1999. Genetic similarities among cocoyam cultivars based on randomly amplified polymorphic DNA (RAPD) analysis. Scientia Horticulturae 80(3-4):267-276. **Keywords:** Cultivars, genetic variation, germplasm, random amplified polymorphic DNA, cultivar identification, variety classification, cluster analysis.

Seigler, D.S., B.R. Maslin and E.E. Conn. 1989. Cyanogenesis in the Leguminosae. Pp. 645-672 *In* Advances in legume biology. (C.H. Stirton and J.L. Zarucchi (eds.)). Monogr. Syst. Bot. Missouri Bot. Gard. 29, St. Louis, Missouri, USA. **Keywords:** *Phaseolus lunatus*, HCN, linamarin, seed, toxicity, *Lablab*, *Pachyrhizus*, lima bean, common bean, nutrition, food quality, *Vigna* .

Shah, A.A., H. Stegemann and M. Galvez. 1993. The Andean tuber crops mashua, oca and ulluco: optimizing the discrimination between varieties by electrophoresis and some characters of the tuber proteins. Plant Varieties and Seeds 6(2):97-108. **Keywords:** Esterases, nutritive value, SDS page, variety classification, proteins.

Shevchenko, S.V. 1979. Obtaining callus and haploid seedlings by the anther culture of certain angiosperms. 3-ya-Vses.-konf.-Kul'tura-kletok-rast.,-Abovyan, 157-158p. **Keywords:** Haploidy, cold, anther culture, cereals, effects.

Sinha, R.P., R. Prakash and M.F. Haque. 1977. Genotypic and phenotypic correlation studies in yam bean (*Pachyrhizus erosus*). Tropical Grain Bulletin No. 724-25. **Keywords:** Yield components, growth, yields, grain legumes, plant development.

Sinha, R.P., R. Prakash and M.F. Haque. 1977. Genetic variability in yam bean (*Pachyrhizus erosus* Urban). Tropical Grain Legume Bulletin No. 7:21-23. **Keywords:** Yield components, grain legumes.

Sirju Charran, G., F. Hosein., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. The construction and use of cDNA libraries in the genetic improvement of *Pachyrhizus* Rich ex DC. Proceedings of 2nd International Symposium on Tuberous Legumes. Guanajuato, Mexico, 5-8 August 1996. 1998, 351-357. **Keywords:** Complementary DNA, RNA, seeds, molecular genetics, biotechnology.

Siso, A.M.d. and S.J. Siso. 1978. Cytological observations on *Xanthosoma sagittifolium* L. and *Colocasia esculenta* Schott, (Araceae). Venezuela, Universidad Centro Occidental: Reports of the 5th Venezuelan Congress of Botany, Barquisimeto, 14-19 May . 1978:119-120. **Keywords:** Chromosomes.

Smartt, J. 1984. Gene pools in grain legumes. Econ. Bot. 38(1):24-35. **Keywords:** *Arachis*, *Cajanus*, *Cyamopsis*, *Dolichos*, *Lablab*, *Macrotyloma*, *Glycine*, *Lathyrus*, *Lens*, *Pachyrhizus*, *Phaseolus*, *Pisum*, *Psophocarpus*, *Vicia*, *Vigna.*

Sorensen, M. 1996. Yam bean (*Pachyrhizus* DC.). Promoting the conservation and use of underutilized and neglected crops 2. IPGRI, Rome, Italy. **Keywords:** Taxonomy, botany, morphology, ecology, reproduction, agronomy, nitrogen fixation, plant composition, nutritive value, geographical distribution, genetics, breeding.

Spitters, C.J.T., L. Vosselman., J.M.M. Engels., W.N.M.v. Kester and A.C. Zeven. 1975. Investigations of the inheritance of flower variegation in *Mirabilis jalapa* L. 6. Genetic system of flower variegation and speculation about its existence. Euphytica 24(2): 323-332. **Keywords:** Genetics, flowers, colour, ornamental plants, ornamental bulbs.

Staritsky, G. 1980. *In vitro* storage of aroid germplasm. Plant Genetic Resources Newsletter No. 42:25-27. **Keywords:** Gene banks, techniques, tissue culture, storage, root crops.

Takayanagi, K. and M. Hirai. 1990. Collection and identification of taro varieties in Japan. JICA Ref Series No. 3: 101-113. **Keywords:** Plant introduction, varieties, cultivars, history, variety classification, plant genetic resources, collecting missions.

Tambong, J.T., M. Meboka., F. Ofori and S.K. Hahn. 1994. Cocoyam (*Xanthosoma sagittifolium* Schott (L.)) hybridization studies: pollen viability and seed germination. Tropical root crops in a developing economy held at AccraGhana, 20-26 October 1991. Acta Horticulturae. 1994, No. 380:448-452. **Keywords:** Root vegetables, pollen, viability, seed germination, i*n vitro* culture, sucrose, pollen germination, germination, root crops.

Tambong, J.T., X. Ndzana., J.G. Wutoh and R. Dadson. 1997. Variability and germplasm loss in the Cameroon national collection of cocoyam (*Xanthosoma sagittifolium* Schott (L.)). Plant Genetic Resources Newsletter No. 112:49-54. **Keywords:** Germplasm, evaluation, collecting missions, gene banks.

Tambong, J.T., V.T. Sapra and S. Garton. 1998. *In vitro* induction of tetraploids in colchicine-treated cocoyam plantlets. Euphytica 104(3):191-197. **Keywords:** Tissue culture, colchicine, dimethyl sulfoxide, flow cytometry, DNA, chromosome number, ploidy.

Taylor, M. 1993. Plant germplasm conservation in the South Pacific. IBPGR Newsletter for Asia, the Pacific and Oceania No. 12:10-11. **Keywords:** Plant collections, sweet potatoes, bananas, cassava, plant introduction, gene banks.

Tiwari, R., R. Prakash., H. Md Fazlul and M. Fazlul Haque. 1977. Effect of gamma radiation on germination and survival in yam bean. Tropical Grain Legume Bulletin No. 10:6-7. **Keywords:** Gamma radiation, seed germination, seed treatment, irradiation, vegetables.

Tiwary, R., R. Prakash., C.M. Sharma and F. Haque. 1980. Effect of gamma irradiation on tuber characteristics in yam bean (*Pachyrhizus erosus* Rich.). Tropical Grain Legume Bulletin No. 17-18:40-42. **Keywords:** Induced mutations, gamma radiation, seed treatment, irradiation, vegetables.

Toledo, J., P. Dehal., F. Jarrin., J. Hu., M. Hermann., I. Al Shehbaz and C.F. Quiros. 1998. Genetic variability of *Lepidium meyenii* and other Andean *Lepidium* species (Brassicaceae) assessed by molecular markers. Annals of Botany 82(4):523-530. **Keywords:** Genetic variation, phylogeny, wild relatives, ploidy, genetic markers, random amplified polymorphic DNA.

Trognitz, B.R., M. Hermann and S. Carrion. 1998. Germplasm conservation of oca (*Oxalis tuberosa* mmol.) through botanical seed. Seed formation under a system of polymorphic incompatibility. Euphytica 101(2): 133-141. **Keywords:** Germplasm, conservation, self incompatibility, diallel analysis, gene banks, pollination.

Vasudevan, K. and J.S. Jos. 1991. Gamma ray induced mutants in *Xanthosoma*. Mutation Breeding Newsletter No. 37:11-12. **Keywords:** Induced mutations, radiation, root crops.

Veselovskii, I.A. and L.E. Gorbatenko. 1981. High-altitude potato species and their use in breeding for frost resistance. Byulleten' Vsesoyuznogo Ordena Lenina i Ordena Druzhby Narodov Instituta Rastenievodstva Imeni N. I. Vavilova No. 112:22-25. **Keywords:** Interspecific hybridization, evolution, cold resistance, breeding, root crops, tuberous species.

Volin, R.B. and A.J. Beale. 1982. Genetic variation in F1 cocoyam (*Xanthosoma* sp.) hybrids. Proceedings of the Florida State Horticultural Society. 1981. 94:235-238. **Keywords:** Tubers, shape, colour, plant height, root crops.

Zandvoort, E.A. 1987. *In vitro* germplasm conservation of tropical aroids. Acta Botanica Neerlandica 36(2): 150. **Keywords:** Tissue culture, cryopreservation, root crops.

Zandvoort, E.A., M.J.H. Hulshof and G. Staritsky. 1994. *In vitro* storage of *Xanthosoma* spp. under minimal growth conditions. Plant Cell, Tissue and Organ Culture 36(3):309-316. **Keywords:** *In vitro* culture, tissue culture, storage, culture media, wild relatives.

Zimmerer, K.S. 1996. Changing fortunes - Biodiversity and peasant livelihood in the Peruvian Andes. University of California Press. Berkeley, California, USA. 308 p. **Keywords:** *Solanum tuberosum*, potato, *ex situ* conservation, landraces, *in situ* conservation, on-farm conservation, maize, *Zea mays*, *Ullucus tuberosus*, olluco, *Chenopodium quinoa*, *Lupinus mutabilis*, tarwi, *Arracacia xanthorrhiza*, arracacha, *Tropaeolum tuberosum*, mashua, *Solanum phureja*, Peru.

PLANT PROPAGATION

Afreen Zobayed, F., S.M.A. Zobayed., C. Kubota., T. Kozai and O. Hasegawa. 2000. A combination of vermiculite and paper pulp supporting material for the photoautotrophic micropropagation of sweet potato. Plant Science 157(2):225-231. **Keywords:** Micropropagation, sweet potatoes, vermiculite, *in vitro*, vegetative propagation, culture media.

Alamu, S. and C.R. McDavid. 1978. Effect of time and method of application of gibberellic acid on the growth and promotion of flowering in tannia (*Xanthosoma sagittifolium*). Tropical Agriculture 55(3):235-241. **Keywords:** Growth regulators, gibberellic acid, flowers, date, leaves, leaf area, plant growth regulators, propagation.

Alamu, S., C.R. McDavid and E.J. Duncan. 1982. Production of viable seed in gibberellic acid-treated tannia (*Xanthosoma sagittifolium* (L.) Schott) plants. Tropical Agriculture 59(4):333-334. **Keywords:** Flowering, growth regulators, gibberellic acid, cultivars, root crops, plant growth regulators.

Alandia B., S. 1967. Producción de semilla sexual de oca. Sayana 2:12-15. **Keywords:** *Oxalis tuberosa*, plant propagation, sexual propagation.

Anaya, A.L. and H.R. Pelayo Benavides. 1997. Allelopathic potential of *Mirabilis jalapa* L. (Nyctaginaceae): effects on germination, growth and cell division of some plants. Allelopathy Journal 4(1):57-68. **Keywords:** Plant growth regulators, plant extracts, mitosis, polyploidy, growth rate, barley, peas, maize, radishes, allelopathy, seed germination, ecology, weed biology, cereals.

Asokan, M.P., O.H. SK and R.E. Litz. 1984. Rapid multiplication of *Xanthosoma caracu* by in vitro shoot tip culture. HortScience 19(6): section 1, 885-886. **Keywords:** Tissue culture, root crops.

Balange, A.P., A. Driouich and D.O. Ndoumou. 1998. Tania: between tradition and biotechnology. Biofutur No. 18(3):36-39. **Keywords:** Cultivars, *in vitro*, plant pathogens, plant diseases, cuttings, micropropagation, varietal susceptibility.

Beale, A.J. 1980. Effects of fertilization, herbicides, growth regulators, planting material, and breeding on malanga (*Xanthosoma* spp.) production in southern Florida. Dissertation Abstracts International, B 40(8):3523-3524. **Keywords:** Breeding, fertilization, growth regulators, root crops, mixtures.

Beale, A.J., V.E. Green, Jr. and J.L. Parrado. 1982. Inducement of flowering in taniers (*Xanthosoma* spp.). Journal of Agriculture of the University of Puerto Rico 66(2):115-122. **Keywords:** Flowering, induction, growth regulators, gibberellic acid, benzyladenine, plant growth regulators.

Bon, H.d., R. Boula and H. De Bon. 1992. Improved cultivation of tania, *Xanthosoma sagittifolium* (L.) Schott, in Martinique. Agronomie Tropicale 46(1):3-11. **Keywords:** Genetic resources, diseases, crop husbandry, vegetative propagation, farming systems, ecotypes, evaluation.

Bressan, W., C.H. Siqueira de Carvalho and D.M. Sylvia. 2000. Inoculation of somatic embryos of sweet potato with an arbuscular mycorrhizal fungus improves embryo survival and plantlet formation. Canadian Journal of Microbiology 46(8):741-743. **Keywords:** Somatic embryos, sweet potatoes, growth stages, *in vitro* culture, tissue culture, mycorrhizas, vermiculite, *in vitro* regeneration, culture media.

Castro, Y., C.A. Fierro and A. Cedeno. 1976. Effect of naphthaleneacetic acid and kinetin on the development "in vitro" of tania meristems (*Xanthosoma caracu* Koch et Bouche). American Society for Horticultural Sciences Puerto Rico, December 5-10, 1976. undated, 356-361. **Keywords:** Tissue culture, meristems, growth regulators, NAA, kinetin, plant growth regulators.

Cedeno Maldonado, A., C. Fierro and A. Bosques. 1988. Salt and sugar levels for effective plant regeneration from in vitro cultured tissues of cocoyam. Journal of Agriculture of the University of Puerto Rico 72(4): 515-520. **Keywords:** Tissue culture, meristems, kinetin, techniques, plant growth regulators.

Cedeno Maldonado, A. and A. Bosque Vega. 1992. Yield of cocoyam cultivars propagated by the single bud method. Journal of Agriculture of the University of Puerto Rico 76(1):1-7. **Keywords:** Cultivars, root crops, vegetative propagation, yields, variety trials.

Conner, A.J., X.R. Zhang and A.R. Wooding. 1993. Micropropagation of oca on a high sucrose medium promotes starch accumulation and plant establishment in soil. New Zealand Journal of Crop and Horticultural Science 21(1):91-93. **Keywords:** Tissue culture, *in vitro* culture, culture media, metabolism, starch, carbohydrates.

Dorle, U.P. and A.R. Kulkarni. 1984. Anther culture for production of pollen haploids in *Tropaeolum majus* L. Current Science, India 53(16):867-868. **Keywords:** Tissue culture, propagation, anthers, ornamental plants, ornamental herbaceous plants.

Estrella, J.E. and J.E. Lazarte. 1994. In vitro propagation of jicama (*Polymnia sonchifolia* Poeppig & Endlicher): a neglected Andean crop. HortScience 29(4):331. **Keywords:** Plant growth regulators, tissue culture, *in vitro* culture, micropropagation, conservation, regeneration, biotechnology.

Fernandez, E. and Z. Opatrny. 1996. Organ specificity of regeneration in explant cultures of Yacon, *Polymnia sonchifolia* Poeppig & Endlicher. Agricultura Tropica et Subtropica No. 29:99-108. **Keywords:** Regeneration, *in vitro* culture, explants.

Fierro, C.A. 1976. *In vitro* induction of storage organs in tanier (*Xanthosoma* spp.) by combinations of growth regulators. American Society for Horticultural Sciences Puerto RicoDecember 5-10, 1976. undated, 368-375. **Keywords:** Tissue culture, growht regulators, absicic acid, kinetin, plant growth regulators.

Garcia, M., V. Peralta and S. Rodriguez. 1989. *In vitro* culture of apical meristems of tannier (*Xanthosoma* spp.) for seed production. Ciencia y Tecnica en la Agricultura, Viandas Tropicales 12(2):17-26. **Keywords:** Tissue culture, propagation.

Gomez, L., R. Valverde., O. Arias and T. Thorpe. 1992. Regeneration of *Xanthosoma sagittifolium* by somatic embryogenesis. Agronomia Costarricense 16(2): 219-223. **Keywords:** Tissue culture, somatic embryogenesis, regeneration, plant growth regulators, kinetin.

Gupta, P.P. 1985. Plant regeneration and variabilities from tissue cultures of cocoyams (*Xanthosoma sagittifolium* and *X. violaceum*). Plant Cell Reports 4(2):88-91. **Keywords:** Tissue culture, somaclonal variation, plant growth regulators, cytokinins.

Khan, M.R.I., J.K. Heyes and D. Cohen. 1988. Plant regeneration from oca (*Oxalis tuberosa* M.): the effect of explant type and culture media. Plant Cell, Tissue and Organ Culture 14(1):41-50. **Keywords:** Tissue culture, plant growth regulators, cytokinins.

Kovacs, G. and M. Garcia. 1990. Microcorm production in *Xanthosoma* spp. Agrotecnia de Cuba 22(1): 85-86. **Keywords:** Corms, micropropagation, techniques, benzyladenine, plant growth regulators, cytokinins.

Kuroda, S. and J. Ishihara. 1993. Field growth characteristics of plantlets propagated *in vitro* and line selection for increased percentage of sugar in tuberous roots of yacon, *Polymnia sonchifolia*. Bulletin of the Shikoku National Agricultural Experiment Station No. 57:111-121. **Keywords:** Pasture plants, biotechnology, sugars, fructose, osmotic pressure, yield correlations, artificial selection, tissue culture, vegetative propagation, somaclonal variation.

Kuroda, S., M. Yamashita., J. Ishihara and M. Iwasaki. 1993. *In vitro* mass-propagation and variant selection of yacon, *Polymnia sonchifolia*, by tissue culture. Bulletin of the Shikoku National Agricultural Experiment Station No. 57:99-110. **Keywords:** Biotechnology, somaclonal variation, plant growth regulators, tissue culture, *in vitro* culture, regeneration, kinetin, vegetables, cytokinins.

Lempiaienen, T. 1989. Germination of seeds of ulluco (*Ullucus tuberosus*, Baellaceae). Economic Botany. 43(4): 456-463. **Keywords:** Plant propagation, seed.

Liu, L.J., E.R. Marquez., M. Licha and M.L. Biascoechea. 1983. Isolation and culture of callus and protoplasts of taniers (*Xanthosoma* spp.) in Puerto Rico. Phytopathology 73(5):791. **Keywords:** Tissue culture, protoplasts, root crops.

Liu, L.J.Y., E. Rosa Marquez., M. Licha and M.L. Biascoechea. 1988. Tanier (*Xanthosoma* spp.) propagation *in vitro*. Journal of Agriculture of the University of Puerto Rico 72(3):413-426. **Keywords:** Tissue culture, IAA, Kinetin, micropropagation, plant growth regulators, cytokinins.

Luz, J.M.Q., M. Pasqual., R.V.d. Souza and R.V. De Souza. 1993. Meristem culture of Peruvian carrot (*Arracacia xanthorrhiza* Bancroft). Horticultura Brasileira 11(2):129-130. **Keywords:** Tissue culture, root vegetables, meristems, micropropagation, culture media, benzyladenine, plant growth regulators.

Luz, J.M.Q., M. Pasqual., R.J.d. Souza., A.M.M. Nogueira and R.J. De Souza. 1994. *In vitro* propagation of Peruvian carrot (*Arracacia xanthorrhiza* Bancroft). Ciencia e Pratica 18(1): 399-402. **Keywords:** *In vitro* culture, tissue culture.

Matos, M.C., A.A. Matos., J.B.V.d. Silva., J.B.V. da Silva., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. Effect of manual and chemical flower pruning on tuber production of *Pachyrhizus ahipa* (Wedd.) Parodi. Proceedings of the 2nd International Symposium on Tuberous Legumes Guanajuato, Mexico, 5-8 August 1996. 1998, 181-189. **Keywords:** Flowers, pruning, 2,4 D, chlorophyll, plant growth regulators, crop yield.

McDavid, C.R. and S. Alamu. 1979. Effect of daylength and gibberellic acid on the growth and promotion of flowering in tannia (*Xanthosoma sagittifolium*). Tropical Agriculture 56(1): 17-23. **Keywords:** Flowering, photoperiod, growth regulators, gibberellic acid, leaves, photoperiodism, plant growth regulators, sugar crops, plant development.

Munoz, L., P. Krogstrup., J. Estrella., R. Castillo., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. *In vitro* propagation of yam beans (*Pachyrhizus erosus* (L.) Urban) in Ecuador. Proceedings of the 2nd International Symposium on Tuberous Legumes Guanajuato, Mexico, 5-8 August 1996. 1998, 453-467. **Keywords:** Germplasm, IBA, *in vitro* culture, NAA, tissue culture, culture media, rooting, growth regulators, plant growth regulators, benzyladenine.

Nakatani, M. and Y. Koda. 1992. Potato tuber-inducing activity of the extracts of some root and tuber crops. Japanese Journal of Crop Science 61(3):394-400. **Keywords:** Tissue culture, plant growth regulators, potatoes, tubers, growth regulators, abscisic acid, sweet potatoes, cassava, growth stimulators, *in vitro* culture, biochemistry, allelopathy, allelopathins, Compositae, growth inhibitors.

Nguyen Thi, Q. and U. Nguyen Van. 1987. Aroids propagation by tissue culture: 1. Shoot tip culture and propagation of *Xanthosoma violaceum*. HortScience 22(4):671-672. **Keywords:** Tissue culture, meristems, IBA, Benzyladenine, shoot meristems, plant growth regulators, cytokinins.

Noda, H. and W.E. Kerr. 1983. The effects of staking and of inflorescence pruning on the Root production of yam bean (*Pachyrhizus erosus* Urban). Trop. Grain Leg. Bull.(27):35-37. **Keywords:** Physiology plant, production, yields, flowering.

Nyochembeng, L.M. and S. Garton. 1998. Plant regeneration from cocoyam callus derived from shoot tips and petioles. Plant Cell, Tissue and Organ Culture 53(2):127-134. **Keywords:** Callus, tissue culture, auxins, plant growth regulators, kinetin, biotechnology, cytokinins, growth inhibitors.

Ochatt, S.J., A.A. Ciai and O.H. Caso. 1986. Tissue culture techniques applied to native American crops: micropropagation of oca (*Oxalis tuberosa* Moll.) an Andean tuber-bearing species. Turrialba 36(2):187-189. **Keywords:** Tissue culture, gibberellic acid, stems, plant growth regulators.

Onokpise, O.U., J.T. Tambong., L. Nyochembeng and J.G. Wutoh. 1992. Acclimatization and flower induction of tissue culture derived cocoyam (*Xanthosoma sagittifolium* Schott) plants. Agronomie 12(2):193-199. **Keywords:** Growth regulators, flowering, induction, tissue culture, transplanting, growth, gibberellic acid, regeneration.

Pennycooke, J.C. and L.E. Towill. 2000. Cryopreservation of shoot tips from in vitro plants of sweet potato (Ipomoea batatas (L.) Lam.) by vitrification. Plant Cell Reports 19(7):733-737. **Keywords:** vitrification, cryopreservation, kinetin, sweet potatoes, plant growth regulators, tissue culture, benzyladenine, biotechnology, auxins, cytokinins.

Pessoa, A.C.S., R.C. Vieira and M.A. Esquibel. 1994. Induction and histogenesis of calli from petiole explants of Peruvian carrot (*Arracacia xanthorrhiza* Banc.). Arquivos de Biologia e Tecnologia 37(2):231-246. **Keywords:** Tissue culture, plant growth regulators, sucrose, *in vitro* culture, growth regulators, organogenesis, culture media, explants, 2,4 D, benzyladenine.

Saba., D. Pande., M. Iqbal and P.S. Srivastava. 2000. Effect of ZnSO4 and CuSO4 on regeneration and lepidine content in Lepidium sativum L. Biologia Plantarum 43(2):253-256. **Keywords:** Tissue culture, *in vitro* culture, plant growth regulators, explants, shoot apices, yields, nitrogen compounds.

Salazar, S.S. 1985. Meristem cultivation of tropical corms, roots and tubers (first part). Actividades en Turrialba 13(1):6-7. **Keywords:** Sweet potatoes, tissue culture, apical meristems, cassava.

Shanthi, A. and N. Ramaswamy. 1997. Studies on the evaluation of half sib population of sweet potato. Progressive Horticulture 29:3-4. **Keywords:** Evaluation, sweet potatoes, yield components.

Strauss, M.S. and J. Arditti. 1980. Plantlet regeneration from shoot tip cultures of *Xanthosoma caracu*. Annals of Botany 45(2): 209-212. **Keywords:** Tissue culture, vegetables.

Volin, R.B. and F.W. Zettler. 1974. Seed propagation of *Xanthosoma caracu* as a potential means of pathogen elimination and genetic improvement. Proceedings of the American Phytopathological Society 1123. **Keywords:** Hybridization, sugar crops.

Volin, R.B. and F.W. Zettler. 1976. Seed propagation of cocoyam, *Xanthosoma caracu* Koch & Bouche. HortScience 11(5):459-460. **Keywords:** Pollination, diseases.

Westcott, R.J. 1981. Tissue culture storage of potato germplasm. 1. Minimal growth storage. Potato Research 24(3):331-342. **Keywords:** Tissue culture, temperature, techniques, shoot tip culture, root crops, tuberous species, potatoes.

Zok, S., X. Ndzana and L. Nyochembeng. 1998. Field performance of tissue culture derived cocoyam (*Xanthosoma sagittifolium* (L.) Schott). Journal of Agriculture of the University of Puerto Rico 81(3-4):133-139. **Keywords:** *In vitro* culture, tissue culture, planting stock.

TAXONOMY AND EVOLUTION

Arbizu, C. and M. Tapia. 1992. Tubérculos andinos. Pp. 147-161 *In* Cultivos Marginados: Otra Perspectiva de 1492. (E. Hernández Bermejo and J. León (eds.)). Food and Agriculture Organization of the United Nations, Rome, Italy. **Keywords:** Andes, crop origin, crop evolution, genetic diversity, Oxalis, *Tropaeolum*, *Solanum*, *Ullucus*, botany, agronomy, use, South America.

Balée, W. and A. Gély. 1989. Managed forest succession in Amazonia: the Ka'apor case. Adv. Econ. Bot. 71:29-158. **Keywords:** *Manihot esculenta*, cassava, use, *in situ* conservation, *Canna*, *Ipomoea batatas*, sweet potato, yam, Amazon, Brazil.

Berg, R.G., M.J. Zevenbergen., J.P. Kardolus., N. Groendijk Wilders., R.G. van den Berg., S. Andrews., A.C. Leslie and C. Alexander. 1998. The origin of Solanum juzepczukii. Proceedings of the Third International Symposium on the Taxonomy of Cultivated Plants, Edinburgh, UK. **Keywords:** Tuberous species, potatoes, wild relatives, DNA hybridization, interspecific hybridization, biotechnology.

Brako, L. and J.L. Zarucchi. 1993. Catalogue of the flowering plants and gymnosperms of Peru. Missouri Botanical Garden. St. Louis, Missouri, USA. 1286 p. **Keywords:** Flora, phytogeography, taxonomy, *Oxalis*, *Solanum*, *Cyphomandra*, *Physalis*, *Nicotiana*, *Lycopersicon*.

Breedlove, D.E. and R.M. Laughlin. 1993. The flowering of man - A Tzotzil botany of Zinacantán. Smithsonian Contributions to Anthropology 351-706. **Keywords:** Ethnobotany, use, Mexico, Chiapas, *Ipomoea batatas*, sweet potato, *Manihot esculenta*, cassava, *Sechium edule*, chayote.

Brown, A.D. 1995. Fitogeografía y conservación de las selvas de montaña del noroeste de Argentina. Pp. 663-672 *In* Biodiversity and conservation of Neotropical montane forests. (S.P. Churchill., H. Balslev., E. Forero and J.L. Luteyn (eds.). The New York Botanical Garden, New York, USA. Jujuy, Salta, Tucuman. **Keywords:** Life zone, phytogeography, vegetation types, montane forests, Cyclanthera, *Polymnia*, llacon, *Podocarpus*, *Alnus*, *Schinus.*

Brucher, H. 1967. *Ullucus aborigineus* spec.nov., die Wildform einer andine Kulturpflanze. Ber. Deutsch. Bot. Ges. 80:376-381. **Keywords:** Wild species, botany, crop origin, Andes.

Brücher, H. 1989. Useful plants of neotropical origin and their wild relatives. Springer-Verlag. Berlin, Heidelberg, Germany. 296 p. **Keywords:** Morphology, agronomy, origin, *Pachyrhizus, Ipomoea*, *Oxalis*, *Dioscorea*, *Solanum*, *Arracacia*, *Canna*, *Maranta*, *Tropaeolum*, *Ullucus*, *Xanthosoma*, *Sechium*.

Bruneau, A., J.J. Doyle and J.L. Doyle. 1995. Phylogenetic relationships in Phaseoleae: evidence from chloroplast DNA restriction sites characters. Pp. 309-330 *In* Advances in legume systematics 7: phylogeny. (M.D. Crisp and J.J. Doyle (eds.)). Royal Botanic Gardens, Kew, England. **Keywords:** Taxonomy, DNA, chloroplast genome, inverted repeat, deletion, molecular markers, *Pachyrhizus*, restriction enzymes, molecular systematics.

Bunting, G.S. 1979. Synopsis of the Araceae of Venezuela. Revista de la Facultad de Agronomia 10(1-4):139-285. **Keywords:** Taxonomy.

Cárdenas, M. 1989. Manual de plantas económicas de Bolivia - 2da edición. Editorial Los Amigos del Libro. La Paz, Bolivia. 333 p. **Keywords:** *Arracacia xanthorrhiza*, use, ethnobotany, agronomy, *Solanum tuberosum*, potato, cassava, *Manihot esculenta*, geographic distribution, ecology, crop history, Andes, Peru.

Clement, C.R. 1992. Los cultivos de la Amazonía y Orinoquía: origen, decadencia y futuro. Pp. 193-201 *In* Cultivos marginados: otra perspectiva de 1492. (E. Hernández Bermejo and J. León (eds.)). Food and Agriculture Organization of the United Nations, Rome, Italy. **Keywords:** Crop origin, plant domestication, *Manihot*, *Ipomoea*, *Xanthosoma*, *Erythroxylon*, *Ananas*, *Bactris*, *Bixa*, agroforestry, Amazon.

Coe, F.G. and G.J. Anderson. 1997. Ethnobotany of the Miskitu of eastern Nicaragua. J. Ethnobiol. 17(2):171-214. **Keywords:** Use, ethnobotany, medicinal, nutrition, food, *Manihot esculenta*, cassava, yam, Dioscorea, trifida, yautia, Xanthosoma, sagittifolium, agronomy, Central America.

Cohen, M.N. 1978a. Archaeological plant remains from the central coast of Peru. Nawpa Pacha 1623-50. **Keywords:** Archaeology, crop history, *Ipomoea batatas*, sweet potato, *Canna,* achira, potato, Solanum, *Manihot esculenta*, cassava, *Pachyrhizus*, yam bean, crop introduction, Andes.

Cohen, M.N. 1978b. Population pressure and the origins of agriculture: an archaeological example from the Coast of Peru. Pp. 135-177 *In* Origins of agriculture. (C.A. Reed (eds.)). Mouton Publishers, The Hague, Paris. **Keywords:** *Pachyrhizus tuberosus*, jicama, *Polymnia*, yacon, lima bean, archaeology, *Capsicum*, *Cucurbita*, Peru.

Croat, T.B., S.P. Churchill., H. Balslev., E. Forero and J.L. Luteyn. 1995. Floristic comparisons of Araceae in six Ecuadorian florulas. Biodiversity and conservation of Neotropical montane forests New York Botanical Garden21-26 June 1993. 1995, 489-499. **Keywords:** Mountain forests, rain forests, mountains, species diversity, altitude, plant ecology, tropical forests.

Dawson, G. 1960. Los alimentos vegetales que America dio al mundo. Universidad Nacional de La Plata, Facultad de Ciencias Naturales y Museo. Serie Tecnica y Didactica No. 8. La Plata, República Argentina. 68 p. **Keywords:** Use, food, ethnobotany, *Ipomoea batatas*, sweet potato, *Manihot esculenta*, cassava, *Maranta arundinaceae*, arrow root, *Arracacia xanthorhiza*, arracacha, *Tropaeolum tuberosum*, mashua, *Pachyrhizus tuberosus*, roots, tubers, Ullucus, tuberosus, olluco, *Polymnia sonchifolia*, yacon, *Canna edulis*, achira, crop origin, crop history.

Debouck, D.G. and D. Libreros Ferla. 1995. Neotropical montane forests: a fragile home of genetic resources of wild relatives of New World crops. Pp. 561-577 *In* Biodiversity and conservation of Neotropical montane forests. (S.P. Churchill., H. Balslev., E. Forero and J.L. Luteyn (eds.)). The New York Botanical Garden, New York, USA. **Keywords:** Life zones, montane forests, *Polymnia sonchifolia*, *Pachyrhizus*, wild species, geographic distribution, yacon, potato, *Solanum andigena, ex situ* conservation, *in situ* conservation, Andes.

Downie, S.R., S. Ramanath., D.S. Katz-Downie and E. Llanas. 1998. Molecular systematics of Apiaceae subfamily Apioideae: phylogenetic analyses of nuclear ribosomal DNA internal transcribed spacer and plastid *RPOC1* intron sequences. American Journal Botany 85(4):563-591. **Keywords:** *Arracacia*, molecular markers, arracacha, taxonomy.

Emshwiller, E. and J.J. Doyle. 1998. Origins of domestication and polyploidy in oca (*Oxalis tuberosa*: Oxalidaceae): nrDNA ITS data. American Journal of Botany 85(7):975-985. **Keywords:** Domestication, polyploidy, genomes, phylogeny, ribosomal DNA, taxonomy, evolution, biotechnology.

Engel, F. 1970. Exploration of the Chilca canyon, Peru. Current Anthropol. 11(1):55-58. **Keywords:** Archaeology, Peru, *Ipomoea*, *Pachyrhizus*, *Solanum*, *Ullucus*, *Opuntia*, *Lagenaria*, crop origin.

Engel, F. 1973. New facts about pre-Columbian life in the Andean lomas. Curr. Anthropol. 14(3):271-280. **Keywords:** Peru, archaeology, crop origin, *Pachyrhizus*, potato, *Ullucus*, *Manihot*, *Ipomoea*.

Esquinas Alcazar, J.T. 1982. Phytogenetic resources of the Andean region. (5). The phytogenetic resources of Peru. Plant Genetic Resources Newsletter No. 52:31-36. **Keywords:** Gene banks, taxonomy.

Esquivel, M. and K. Hammer. 1992. Native food plants and the American influence in Cuban agriculture. Pp. 46-74 *In* "... y tienen faxones y fabas muy diversos de los nuestros ..." Origin, evolution and diversity of Cuban plant genetic resources. (K. Hammer., M. Esquivel and H. Knupffer (eds.)). Institut für Pflanzengenetik und Kulturpflanzenforschung, Gatersleben, Germany. **Keywords:** *Pachyrhizus erosus*, *Pachyrhizu tuberosus*, use, arracacha, *Arracacia xanthorrhiza*, cassava, *Manihot esculenta*, sweet types, bitter types, Cuba.

Esquivel, M., H. Knupffer and K. Hammer. 1992. Inventory of the cultivated plants. Pp. 213-454 *In* "... y tienen faxones y fabas muy diversos de los nuestros ..." Origin, evolution and diversity of Cuban plant genetic resources. (K. Hammer., M. Esquivel and H. Knupffer (eds.)). Institut fur Pflanzengenetik und Kulturpflanzenforschung, Gatersleben, Germany. **Keywords:** *Pachyrhizus erosus*, *Pachyrhizus tuberosus*, use, Cuba, *Annona*, Sapotaceae, *Anacardium*, *Spondias*, *Manilkara*.

Feofilova, F.G. 1972. On the question of the origin and modern classification of *Canna* cultivars. Trudy Gosudarstvennogo Nikitskogo Botanicheskogo Sada 59:45-56. **Keywords:** Classification, ornamental plants, ornamental bulbs.

Furness, C.A. and P.J. Rudall. 1998. The tapetum and systematics in monocotyledons. Botanical Review 64(3):201-239. **Keywords:** Taxonomy, anthers, developmental stages, protoplasts, ultrastructure, evolution.

García Barriga, H. 1992a. Flora medicinal de Colombia. Tomo I. Tercer Mundo Editores. Bogotá, Colombia. 559 p. **Keywords:** Food analysis, use, geographic distribution, morphology, ethnobotany, *Dioscorea*, *Ullucus*, *Xanthosoma* .

García Barriga, H. 1992b. Flora medicinal de Colombia. Tomo II. Tercer Mundo Editores. Bogotá, Colombia. 537 p. **Keywords:** Geographic distribution, use, morphology, ethnobotany, *Manihot*, *Oxalis tuberosa*, *Tropaeolum tuberosum*, *Ipomoea*.

Gentry, A.H. 1993. A field guide to the families and genera of woody plants of northwest South America (Colombia, Ecuador, Peru). Conservation International. Washington, D.C., USA. 895 p. **Keywords:** Botany, morphology, *Solanum*, taxonomy, tubers.

Girón V., C. 1992. Consideraciones sobre las raices y tuberculos tropicales en la Orinoquia Amazonia venezolana. Pp. 48-56 *In* Tecnologías alternativas para el uso y conservación de bosques tropicales. (K. Jaffé and P. Sánchez (eds.)). Hoturvensa S.A., Caracas, Venezuela. **Keywords:** Use, ethnobotany, cassava, *Manihot*, sweet potato, *Ipomoea*, *Dioscorea*, *Xanthosoma*, *Colocasia*, *Arracacia*, agronomy, Venezuela.

Goncalves, E.G. 2000. *Xanthosoma riparium* (Araceae), a new species from Goias, Brazil. Novon 10(1):26-28. **Keywords:** New species, taxonomy, plant genetic resources, root crops.

Granda, I.A. 1994. *Xanthosoma cubense* (Schott) Schott (Araceae): taxonomy and nomenclature. Studia Botanica 12: 237-240. **Keywords:** Vegetables, geographical distribution, taxonomy, nomenclature, root crops, wild relatives.

Grootjen, C.J. and F. Bouman. 1988. Seed structure in Cannaceae: taxonomic and ecological implications. Annals of Botany 61(3):363-371. **Keywords:** Seeds, morphology, germination, plant physiology, taxonomy, seed anatomy, longevity.

Gunn, C.R. 1981. Seeds of Leguminosae. Pp. 913-925 *In* Advances in legume systematics. Part 1. (R.M. Polhill and P.H. Raven (eds.)). Royal Botanic Gardens, Kew, Richmond, United Kingdom. **Keywords:** Taxonomy, *Phaseolus*, Phaseolinae, testa, anatomy, morphology, *Pachyrhizus*, *Canavalia*, *Glycine*.

Hawkes, J.G., D.R. Harris and G.C. Hillman. 1989. The domestication of roots and tubers in the American tropics. Foraging and farming: the evolution of plant exploitation. One World Archaeology No. 13 : 481-503. **Keywords:** *Ipomoea*, *Calathea*, *Xanthosoma*, jicama, ajipa, yam bean, *Pachyrhizus erosus*, *Pachyrhizus tuberosus*, *Pachyrhizus ahipa*, geographic distribution, archaeology, yacon, mauka, oca, maca, *Ullucus*, malanga, arracacha, achira, sweet potato.

Hernandez Bermejo, J.E. and J. Leon. 1994. Neglected crops: 1492 from a different perspective. FAO Plant Production and Protection Series No. 26. Food and Agriculture Organization (FAO); Rome; Italy. 341 pp. **Keywords:** Tubers, cereals, fruit crops, plant introduction, maps, genetic erosion, cocoa.

Hernández Xolocotzi, E. 1993. Aspects of plant domestication in Mexico: a personal view. Pp. 733-753 *In* Biological diversity of Mexico: origins and distribution. (T.P. Ramamoorthy., R. Bye., A. Lot and J. Fa (eds.)). Oxford University Press, Inc., New York, USA. **Keywords:** Archaeology, crop evolution, crop history, *Pachyrhizus*, *Manihot*, *Ipomoea*, use, genetic erosion.

Huang, J.C. and M. Sun. 2000. Genetic diversity and relationships of sweetpotato and its wild relatives in *Ipomoea* series *Batatas* (Convolvulaceae) as revealed by inter-simple sequence repeat (ISSR) and restriction analysis of chloroplast DNA. Theoretical and Applied Genetics 100(7):1050-1060. **Keywords:** chloroplast DNA, sweet potatoes, interspecific hybridization, wild relatives, genetic markers, genetic diversity, restriction fragment length polymorphism, biotechnology.

IBPGR. 1989. Descriptors for *Xanthosoma*. IBPGR, Rome, Italy. 30 p. **Keywords:** Classification, characterization.

Isely, D. 1990. Vascular flora of the Southeastern United States. The University of North Carolina Press. Chapel Hill, North Carolina, USA. 258 p. **Keywords:** Morphology, geographic distribution, *Pachyrhizus*, *Lablab*, pulses, yam bean.

Johns, T., D.R. Harris and G.C. Hillman. 1989. A chemical-ecological model of root and tuber domestication in the Andes. Foraging and farming: the evolution of plant exploitation. One World Archaeology No. 13:504-519. **Keywords:** Genetic resources, starch crops, evolution, toxic substances, plant composition, tuberous species, artificial selection, glycoalkaloids, breeding.

King, S.R., H.H.C. Bastien., G.T. Prance and M.J. Balick. 1990. *Oxalis tuberosa* Mol. (Oxalidaceae) in Mexico: an Andean tuber crop in Meso-America. New directions in the study of plants and people. Advances in Economic Botany 8:77-91. **Keywords:** Root vegetables, *Oxalis*, Mexico.

Kumagai, T., O. Yamakawa and K. Ishiguro. 1998. 'Sunny Red': new sweet potato cultivar for powder. Sweetpotato Research Front(7):2. **Keywords:** Sweet potatoes, cultivars, characteristics.

Lackey, J.A. 1977. A revised classification of the tribe Phaseoleae (Leguminosae: Papilionoideae), and its relation to canavanine distribution. Bot. J. Linn. Soc. 74:163-178. **Keywords:** Taxonomy, *Phaseolus*, Phaseolinae, *Pachyrhizus*, free amino acid, genera classification.

Lackey, J.A. 1981. Tribe 10. Phaseoleae. Pp. 301-327 *In* Advances in legume systematics. Part 1. (R.M. Polhill and P.H. Raven (eds.)). Royal Botanic Gardens, Kew, Richmond, United Kingdom. **Keywords:** Taxonomy, *Phaseolus*, Phaseolinae, subtribes, anatomy, morphology, blastogeny, Cajaninae, *Pachyrhizus*, *Canavalia*, *Glycine*, *Vigna*, *Centrosema*, *Lablab*.

León, J. 1964a. The 'Maca' (*Lepidium meyenii*), a little known food plant of Peru. Econ. Bot. 18(2):122-127. **Keywords:** Origin, *Lepidium*, tuber.

León, J. 1964b. Plantas alimenticias andinas. Instituto Interamericano de Ciencias Agricolas, Zona Andina, Boletin Técnico No. 6. Lima, Perú. 112 p. **Keywords:** Use, crop origin, botany, agronomy, *Ullucus*, *Oxalis*, *Tropaeolum*, *Canna*, *Lepidium*, *Pachyrhizus*, *Arracacia*, *Polymnia*, Andean region.

León, J. 1987. Botánica de los cultivos tropicales. Instituto Interamericano de Cooperación para la Agricultura, Servicio Editorial. San José, Costa Rica. 445 p. **Keywords:** *Pachyrhizus erosus*, jicama, ahipa, botany, morphology.

Lundell, C.L. 1939. Plants probably utilized by the old empire Maya of Petén and adjacent lowlands. Pap. Mich. Acad. Sci. Arts & Lett. 24(1):37-56. **Keywords:** Crop history, archaeology, Maya, Guatemala, Yucatan, Peten, *Zea mays*, maize, *Phaseolus vulgaris*, common bean, *Ipomoea batatas*, sweet potato, *Manihot*, cassava, *Xanthosoma*, Yucca, *Pachyrhizus*, Sapotaceae, *Persea*, avocado, *Carica*, *Annona*, *Spondias*, *Psidium*, *Byrsonima*, *Acrocomia*, *Theobroma*, *Capsicum*, *Cedrela*, *Agave*, *Gossypium*, *Bixa*, *Crescentia*, *Lagenaria*, *Nicotiana*, Castilla, use, Guatemala.

Macbride, J.F. 1943. Flora of Peru - Family Leguminosae. Field Mus. Nat. Hist. Bot. Ser. 13(1):1-507. **Keywords:** *Pachyrhizus*, botany, use, wild species, cultivated species, pachyrrhizoides, geographic distribution, type specimen, taxonomy, Peru.

Mahecha Vega, G.E. 1997. Fundamentos y metodología para la identificación de plantas. Proyecto BIOPACIFICO, Ministerio del Medio Ambiente, PNUD-GEF. Bogotá, D.C., Colombia. 282 p. **Keywords:** Taxonomy, morphology, systematics, *Dioscorea*, *Xanthosoma*, *Solanum*.

Martínez, M. 1979. Catálogo de nombres vulgares y científicos de plantas mexicanas. Fondo de Cultura Económica. México, D.F., México. 1247 p. **Keywords:** *Pachyrhizus erosus*, jicama, morphology, use, *Ipomoea batatas*, Mexico.

McVaugh, R. 1987. Flora Novo-Galiciana - A descriptive account of the vascular plants of western Mexico - Volume 5 Leguminosae. The University of Michigan Press. Ann Arbor, Michigan, USA. 786 p. **Keywords:** Taxonomy, *Pachyrhizus erosus*, geographic distribution, use, ethnobotany, wild species, Mexico.

Montaldo B., P. 1988. Agricultura precolombina en Chile. AgroSur 16(2):132-139. **Keywords:** Archaeology, crop history, crop origin, *Canna edulis*, achira, *Ipomoea batatas*, sweet potato, *Manihot esculenta*, cassava, *Oxalis tuberosa*, oca, potato, Peru, Bolivia.

Montes de Oca, I. 1989. Geografía y recursos naturales de Bolivia. Editorial Educational, Ministerio de Educación y Cultura. La Paz, Bolivia. 574 p. **Keywords:** Use, yield, *Ullucus tuberosus*, geography, vegetation types, climate, rainfall, Andes.

Murkherjee, I. and T.N. Khoshoo. 1971. Genetic-evolutionary studies on cultivated *Canna*. V: Intraspecific polyploidy in starch yielding *Canna edulis*. Genet. Iber. 23:35-42. **Keyword**: Achira, origin, evolution.

Nagl, W. 1976. Early embryogenesis in *Tropaeolum majus* L.: evolution of DNA content and polyteny in the suspensor. Plant Science Letters 7(1):1-6. **Keywords:** Seeds, development, cytology, ornamental plants, ornamental herbaceous plants.

Ochoa, C.M. and D. Ugent. 1990. The potatoes of South America: Bolivia. Cambridge University Press; Cambridge; UK. 512 p. **Keywords:** Maps, tuberous species, taxonomy, genetic resources, plant genetic resources.

Parodi, L.R. and A.L. Pastore. 1939. Géneros de plantas cultivadas representados en la flora indígena de la República Argentina. Physis 18:255-268. **Keywords:** *Ananas*, *Canna*, *Dioscorea*, *Maranta, Manihot*, *Solanum*, *Polymnia*, wild relatives, crop origin, Argentina.

Patiño, V.M. 1964. Plantas cultivadas y animales domesticos en América equinoccial. Tomo 2. Plantas alimenticias. Imprenta Departamental. Cali, Colombia. 364 p. **Keywords:** *Polymnia sonchifolia*, yacon, *Pachyrhizus ahipa*, use, ethnobotany, ajipa, jicama*, Xanthosoma*, *Canna*, *Maranta*, *Dioscorea*, *Ullucus*, *Oxalis*, *Tropaeolum*, *Manihot*, *Arracacia*, *Solanum*, *Ipomoea*, geographic distribution, crop history, Colombia, Ecuador.

Pearsall, D.M. 1992. The origins of plant cultivation in South America. Pp. 173-205 *In* The origins of agriculture - An international perspective. (C.W. Cowan and P.J. Watson (eds.)). Smithsonian Institution Press, Washington, D.C. USA. **Keywords:** Archaeology, plant domestication, crop origin, *Pachyrhizus*, *Ipomoea*, *Ullucus*, *Manihot*, *Canna*, potato, cassava, *Arracacia xanthorrhiza*, Peru, Chile, Argentina, Ecuador.

Pérez Arbeláez, E. 1978. Plantas utiles de Colombia. Litografía Arco. Bogotá, Colombia. 831 p. **Keywords:** Ethnobotany, geographic distribution, *Lepidium*, use.

Pickersgill, B. and C.B. Heiser. 1978. Origins and distribution of plants domesticated in the New World tropics. Pp. 133-165 *In* Advances in Andean archaeology. (D.L. Browman (eds.)). Mouton Publishers, The Hague, Paris. **Keywords**: Provenance, geographical distribution, roots, tubers.

Pido, N.L., J.R. Pardales, Jr., F.G. Villamayor, Jr. and A.M. Mariscal. 1986. Minor root crops: their classification and description. Root Crops Digest 1(5):1-6. **Keywords**: Taxonomy, yams.

Pittier, H. 1926. Manual de las plantas usuales de Venezuela. Litografia del Comercio. Caracas, Venezuela. 458 p. **Keywords**: *Polymnia sonchifolia*, *Pachyrhizus erosus*, Venezuela, *Ananas*, *Phaseolus vulgaris*, *Lunatus coccineus*, *Psidium*, use, ethnobotany, *Eugenia*, *Manihot*, *Annona*, *Passiflora*, Sapotaceae, *Achras*, cassava, *Arracacia xanthorrhiza*.

Pollock, N.J. 1992. These root remain - Food habits in islands of the central and eastern Pacific since Western contact. University of Hawaii Press. Honolulu, Hawaii, USA. 298 p. **Keywords:** Breadfruit, taro, use, nutrition, *Colocasia esculenta*, crop origin, agronomy, geographic distribution, *Xanthosoma*, *Dioscorea*, *Ipomoea*, *Manihot*, sweet potato, cassava, crop origin.

Purseglove, J.W. 1968. Tropical crops - Dicotyledons 1. Longman Group Limited. London, United Kingdom. 719 p. **Keywords:** *Pachyrhizus tuberosus*, *Pachyrhizus erosus*, *Pachyrhizus ahipa*, crop origin, use, crop husbandry, nutritional value.

Qi, Z.S. 1993. A correction for the Chinese name of *Tropaeolum majus* L. Acta Horticulturae Sinica 20(2):203-204. **Keywords:** Taxonomy, nomenclature.

Rea, J. 1992. Raíces andinas. Pp. 163-177 *In* Cultivos Marginados: Otra Perspectiva de 1492. (E. Hernández Bermejo and J. León (eds.)). Food and Agriculture Organization of the United Nations, Rome, Italy. **Keywords:** *Lepidium meyenii*, yacon, *Arracacia xanthorrhiza*, arracacha, taxonomy, ecology, genetic resources, *Mirabilis expansa*, mauka, nutritional value, *Polymnia sonchifolia*, geographic distribution, use.

Sanoja, M. 1989. From foraging to food production in northeastern Venezuela and the Caribbean. Pp. 523-537 *In* Foraging and farming - The evolution of plant exploitation. (D.R. Harris and G.C. Hillman (eds.)). Unwin Hyman Ltd, London, United Kingdom. **Keywords:** Provenance, cassava, *Manihot*, *Xanthosoma*, *Calathea*, *Zamia*, plant domestication, Colombia, Venezuela.

Sattler, R. and L. Perlin. 1982. Floral development of *Bougainvillea spectabilis* Willd., *Boerhaavia diffusa* L. and *Mirabilis jalapa* L. (Nyctaginaceae). Botanical Journal of the Linnean Society 84(3):161-182. **Keywords:** Flowers, development, ornamental plants, ornamental woody plants, medicinal plants.

Sauer, C.O. 1965. Cultural factors in plant domestication in the New World. Euphytica 14:301-306. **Keywords:** Provenance, *Solanum*, *Ipomoea*, *Canna*, *Maranta*, *Manihot carthaginensis*, wild relatives, ethnobotany, *Xanthosoma*, *Arracacia*, *Ullucus*, *Oxalis*, *Tropaeolum*, *Amaranthus*, Colombia, Brazil.

Schafer, J.L. 1999. Improvement of systems of cultivation of *Xanthosoma sagittifolium* (L.) Schott in the Bamileke region, west Cameroon. Cahiers Agricultures 8(1):9-20. **Keywords:** NPK fertilizers, cultivars.

Schmiediche, P.E., J.G. Hawkes and C.M. Ochoa. 1982. The breeding of the cultivated potato species *Solanum* X *juzepczukii* and *S.* X *curtilobum*. II. The resynthesis of *S.* X *juzepczukii* and *S.* X *curtilobum*. Euphytica 31(3):695-708. **Keywords:** Evolution, interspecific hybridization, cold resistance.

Seminario, J. 1986. Inventario de los cultivos andinos en Cajamarca. Pp. 235-247 *In* V Congreso internacional de sistemas agropecuarios andinos. (E. Chávez and M. Tapia (eds.)). Proyecto de Investigación de Sistemas Agropecuarios Andinos (PISA), Serie Informes Técnicos No. 9, Lima, Peru. **Keywords:** *Polymnia sonchifolia*, Peru, geographic distribution, use, *Arracacia xanthorrhiza*, *Ullucus tuberosus*, *Oxalis tuberosa*.

Smartt, J. 1990. Grain legumes: evolution and genetic resources. Cambridge University Press. Cambridge, United Kingdom. 379 p. **Keywords:** *Pachyrhizus erosus*, yam bean, jicama, use, *Phaseolus*, taxonomy, crop evolution, cytogenetics, *Arachis*, domestication, morphology.

Smith, C.E. 1977. Recent evidence in support of the tropical origin of New World crops. Pp. 79-95 *In* Crop resources. (D.S. Seigler (eds.)). Academic Press, New York, USA. **Keywords:** Crop origin, Americas, archaeology, *Phaseolus*, *Zea*, *Persea*, *Manihot*, *Oxalis*, *Gossypium*.

Sorensen, M. 1988. A taxonomic revision of the genus *Pachyrhizus* (Fabaceae-Phaseoleae). Nordic Journal of Botany 8(2):167-192. **Keywords:** Yam bean, taxonomy, classification.

Sorensen, M. 1990. Observations on distribution, ecology and cultivation of the tuber-bearing legume genus *Pachyrhizus* Rich. ex DC. Agricultural University Wageningen Papers No. 338 pp. **Keyword:** Starch crops, evolution, interspecific hybridization, vegetables.

Sorensen, M., S. Doygaard., J.E. Estrella., L.P. Kvist and P.E. Nielsen. 1997. Status of the South American tuberous legume *Pachyrhizus tuberosus* (Lam.) Spreng. Biodiversity and Conservation 6(12):1581-1625. **Keywords:** *In situ* conservation, maps, principal component analysis, germplasm, morphology, domestication, genetic variation, taxonomy, multivariate analysis.

Soukup, J. 1986. Vocabulario de los nombres vulgares de la flora peruana y catálogo de los géneros. Editorial Salesiana. Lima, Peru. 436 p. **Keywords:** *Pachyrhizus*, jicama, ajipa, use, vernacular names, Peru, *Phaseolus*, *Capsicum*, ethnobotany.

Sousa S., M. and A. Delgado Salinas. 1993. Mexican Leguminosae: phytogeography, endemism, and origins. Pp. 459-511 *In* Biological diversity of Mexico: origins and distribution. (T.P. Ramamoorthy., R. Bye., A. Lot and J. Fa (eds.)). Oxford University Press, Inc., New York, USA. **Keywords:** Endemism, legumes, phytogeography, *Pachyrhizus*, taxonomy, geographic distribution, Mexico.

Sousa Sanchez, M. and A. Delgado Salinas. 1979. Herramientas y consideraciones para la revisión del genero *Phaseolus*. Pp. 59-82 *In* Contribuciones al conocimiento del frijol (*Phaseolus*) en México. (E.H. Engleman (eds.)). Escuela Nacional de Agricultura, Colegio de Postgraduados, Chapingo, México, México. **Keywords:** *Phaseolus*, taxonomy, morphology, *Vigna*, *Strophostyles*, *Pachyrhizus*.

Standley, P.C. and J.A. Steyermark. 1946. Flora of Guatemala - Part V. Fieldiana, Botany 241-502. **Keywords:** *Phaseolus*, *Pachyrhizus erosus*, use, cultivated species, wild species, geographic distribution, Guatemala

Staples, G.W. and K.R. Woolliams. 1997. An overlooked naturalized aroid for the Hawaiian flora. Bishop Museum Occasional Papers No. 49:13-16. **Keywords:** Geographical distribution, biology, keys, identification.

Tanaka, N. 1998. On the genus *Canna* in Yaeyama Islands, the Ryukyus, Japan. Journal of Japanese Botany 73(3):165-169. **Keywords:** Descriptions, flowers, colour, nomenclature, plant genetic resources.

Towle, M.A. 1961. The ethnobotany of pre-Columbian Peru. Aldine Publishing Co. Chicago, USA. 180 p. **Keywords:** Archaeology, crop origin, Andes, crop history, vulgaris, *Pachyrhizus*, *Ullucus*, *Amaranthus*, *Inga*, ethnobotany, Peru.

Turner II, B.L. and C.H. Miksicek. 1984. Economic plant species associated with prehistoric agriculture in the Maya lowlands. Econ. Bot. 38(2):179-193. **Keywords:** Archaeology, maize, squash, avocado, cocoa, cotton, *Xanthosoma*, *Manihot*, *Cucurbita moschata,* pepo, *Lycopersicon*, tomato.

Ugent, D., S. Pozorski and T. Pozorski. 1981. Prehistoric remains of sweet potato from the Casma Valley, Peru. Phytologia 49(5):401-415. **Keywords:** *Ipomoea*, archaeology, crop history, Andes, *Canna edulis*, achira, *Solanum*, potato, yam bean, jicama, *Pachyrhizus*, use.

Ugent, D., S. Pozorski and T. Pozorski. 1984. New evidence for ancient cultivation of *Canna edulis* in Peru. Econ. Bot 38(4):417-432. **Keywords:** Cultivation, achira, *Canna*.

Vavilov, N.I. 1931. Mexico and Central America as the principal centre of origin of cultivated plants of the New World. Bull. Appl. Bot. Gen. Pl. Breed. 26(3):135-199. **Keywords:** *Capsicum*, crop origin, centers of diversity, *Phaseolus*, *Zea*, *Agave*, *Gossypium*, wild forms, *Pachyrhizus*, squash, Amaranthus.

Vavilov, N.I. 1939. The important agricultural crops of pre-Columbian America and their mutual relationships. Izd. Gos. Geogr. O-va (Public. Nat. Dept. Geogr. USSR) 71(10):1-25. **Keywords:** Crop evolution, centers of origin, Solanum, *Oxalis*, oca, *Ullucus*, *Lepidium*, maca, *Polymnia*, *Xanthosoma*, *Canna*, Arracacia, pepino, *Manihot*, cassava, *Theobroma*, *Arachis*, peanut, Brazil, Mexico.

Verdcourt, B. 1980. The classification of *Dolichos* L. emend. Verdc., *Lablab* Adans., *Phaseolus* L., *Vigna* Savi and their allies. Pp. 45-48 *In* Advances in legume science. (R.J. Summerfield and A.H. Bunting (eds.)). Royal Botanic Gardens, Kew, England. **Keywords:** Taxonomy, Phaseoleae, *Pachyrhizus*, *Macroptilium*, nomenclature.

Voss, E.G., H.M. Burdet., W.G. Chaloner., V. Demoulin., P. Hiepko., J. McNeill., R.D. Meikle., D.H. Nicholson., R.C. Rollins., P.C. Silva and W. Greuter. 1983. International Code of Botanical Nomenclature. Dr. W. Junk, Publishers. The Hague, The Netherlands. 472 p. **Keywords:** Systematics, type specimens, type description, type, Centrosema, Vigna, Leguminosae, *Pachyrhizus*.

Weberbauer, A. 1945. El mundo vegetal de los Andes peruanos. Ministerio de Agricultura, Estación Experimental Agricola de La Molina. Lima, Peru. 776 p. **Keywords:** *Polymnia sonchifolia*, *Pachyrhizus erosus*, geographic distribution, Peru, use, *Phaseolus augusti*, *Phaseolus pachyrrhizoides*, *Phaseolus vulgaris*, *Phaseolus lunatus*, phytogeography, taxonomy, *Arracacia xanthorrhiza*.

Weddell, H.A. 1857. Notice sur l'ahipa et l'aricoma, plantes alimentaires du Haut-Pérou. Ann. Sci. Nat. Bot. 4:111-115. **Keywords:** *Pachyrhizus ahipa*, ahipa, *Polymnia sonchifolia*, yacon, aricoma, Bolivia, Peru, ethnobotany, *Polymnia edulis*, taxonomy.

Wells, J.R. 1965. A taxonomic study of *Polymnia* (Compositae). Brittonia 17:144-159. **Keywords:** Taxonomy, yacon, *Polymnia sonchifolia*, wild species, geographic distribution, ethnobotany, Andean región.

Wilhelm de Mosbach, E. 1992. Botánica indígena de Chile. Editorial Andres Bello. Santiago, Chile. 140 p. **Keywords:** *Rubus*, *Fragaria*, *Ribes*, ethnobotany, *Oxalis*, *Tropaeolum*, *Phaseolus*, mapuche, root crops, use.

Yacovleff, E. 1933. La jiquima, raíz comestible extinguida en el Perú. Rev. Mus. Nac. Lima 2(1):51-66. **Keywords:** Pachyrhizus, yam bean, jicama, archaeology, taxonomy, *Pachyrhizus tuberosus*, *Pachyrhizus ahipa*, ethnobotany.

Zardini, E. 1991. Ethnobotanical notes on "Yacon", *Polymnia sonchifolia* (Asteraceae). Economic Botany 45(1):72-85. **Keywords:** Ethnobotany, conservation, vegetables, Compositae, plant genetic resources.

Zukovskij, P.M. 1962. Cultivated plants and their wild relatives. Commonwealth Agricultural Bureaux. Bucks, England. 107 p. **Keywords:** Crop origin, *Manihot esculenta*, cassava, crop history, plant migration, archaeology, *Xanthosoma sagittifolium*, *Arracacia xanthorhiza*, wild ancestor, Andean region.

CROP MANAGEMENT AND PRODUCTION

Afreen Zobayed, F., S.M.A. Zobayed., C. Kubota., T. Kozai and O. Hasegawa. 1999. Supporting material affects the growth and development of in vitro sweet potato plantlets cultured photoautotrophically. *In Vitro* Cellular and Developmental Biology Plant 35(6):470-474. **Keywords:** *In vitro* culture, sweet potatoes, acclimatization, cellulose, cuttings, porosity, seaweeds, culture media, vermiculite.

Annerose, D., O. Diouf., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. Research on the adaptation of the cultivation of *Pachyrhizus* DC in semiarid zones. Proceedings of 2nd International Symposium

on Tuberous Legumes Guanajuato, Mexico, 5-8 August 1996. 1998, 377-387. **Keywords:** Genotype environment interaction, yield components, evaluation, root crops.

Arevalo, T.A., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. Effect of flower removal on the yield of root tubers of *Pachyrhizus erosus* (L.) Urban. Proceedings of 2nd International Symposium on Tuberous Legumes Guanajuato, Mexico, 5-8 August 1996. 1998, 125-130p. **Keywords:** Biomass production, crop production, ecotypes, flowers, genotypes, marketing, plant development, pruning, deblossoming, root crops.

Ayuk Takem, J.A. and H.R. Chhedda. 1985. Grain yield potential of some diverse maize (*Zea mays* L.) morphotypes intercropped with cocoyam (*Xanthosoma sagittifolium*). Experimental Agriculture 21(2): 145-152. **Keywords:** Crop mixtures, crop density, cereals, maize, *Xanthosoma*.

Canahua Zaga, A. 1977. Cultivo de la arracacha en Puno (*Arracacia xanthorrhiza* Bancr.) Pp 268-271 *in* Primer Congreso Internacional sobre Cultivos Andinos, Ayacucho, 25-28 octubre, 1977. La Paz, Bolivia. Ministerio de Asuntos Campesinos y Agropecuarios; IICA. **Keywords:** White carrot, production, Andean crops.

Castellanos, J.Z., F. Zapata., V. Badillo., J.J. Pena Cabriales., E.S. Jensen and E. Heredia Garcia. 1997. Symbiotic nitrogen fixation and yield of *Pachyrhizus erosus* (L) urban cultivars and *Pachyrhizus ahipa* (wedd) parodi landraces as affected by flower pruning. International Symposium 29(5-6):973-981. **Keywords:** Nitrogen fixation, cultivars, landraces, pruning, flowers, crop yield.

Castillo, T. R. 1984. La zanahoria blanca. Desde el Surco No: 42:38-45. **Keywords:** *Arracacia xanthorrhiza*, cultivation, production.

Decaisne, J. 1848. *Ullucus tuberosus*. Revue Horticole 2:441-443. **Keywords:** *Ullucus tuberosus*, ulluco, Andean tubers, plant morphology, Peru.

Flach, M. and F. Rumawas. 1996. Plant resources of South-East Asia No. 9: plants yielding non-seed carbohydrates. 239 p. **Keywords:** Sweet potatoes, potatoes, Jerusalem artichokes, yams, cassava, starch crops, sago, production, horticultural crops, products, crops.

Goenaga, R. and U. Chardon. 1993. Nutrient uptake, growth and yield performance of three tanier (*Xanthosoma* spp.) cultivars grown under intensive management. Journal of Agriculture of the University of Puerto Rico 77(1-2):1-10. **Keywords:** Plant nutrition, corms, dry matter accumulation, mineral uptake, growth, fertilizers, irrigation.

Harper Goodspeed, T. 1941. Plant hunters in the Andes. Farrar & Rinehart, Inc. New York, USA. 429 p. **Keywords:** Nicotiana, *Chenopodium quinoa*, *Erythroxylon coca*, *Oxalis*, ethnobotany.

Heredia, Z.A. 1971. Effect of flower removal on the yield of jicama (*Pachyrhizus erosus*). Proceedings of the Tropical Region, American Society for Horticultural Science 15:146-150. **Keywords:** Jicama, yield, production.

Hijmans, R.J. 1997. Estimating frost risk in potato production on the Altiplano using interpolated climate data. Impact on a changing world. International Potato Center Program Report. **Keywords:** Climate, frost, potatoes, breeding, cold resistance, cold tolerance, production possibilities.

Hodge, W.H. 1954. The edible arracacha: A litte known food plant of the Andes. Economic Botany 8:195-221. **Keywords:** *Arracacia xanthorrhiza*, white carrot, production.

Hou, L., W. Li., H. Zhou., W. Ji., Q. Liu., S. Lu., L.X. Hou., W.J. Li., H.Y. Zhou., W. Ji., Q.C. Liu and S.Y. Lu. 1999. Studies on overcoming low seed-setting in cross between sweetpotato and 2n pollen clones of its closely related triploid hybrid with plant growth regulator. Acta Agronomica Sinica 25(3):328-334. **Keywords:** Growth regulators, sweet potatoes, fertilization, pollen germination, interspecific hybridization, ovaries, seeds, pollination, seed production, hybrid seed production.

Hulugalle, N.R., R. Lal and O.A. Opara Nadi. 1986. Effect of spatial orientation of mulch on soil properties and growth of yam (*Dioscorea rotundata*) and cocoyam (*Xanthosoma sagittifolium*) on an Ultisol. Journal of Root Crops 12(1):37-49. **Keywords:** Mulches, ultisols, plant residues, soil types genetic.

Irizarry, H. and M.A. Acosta. 1974. Effect of plant density on marketable yield, tuber number, and mean weight of three tanier cultivars. Journal of Agriculture of the University of Puerto Rico 58(1):37-43. **Keywords:** Spacing, stand density, sugar crops, tuber crops.

Irizarry, H., J. Badillo and J.R. Rivera. 1976. Effect of time of planting and age at harvest on marketable yield and quality of four tanier cultivars. Journal of Agriculture of the University of Puerto Rico 60(2):235-261. **Keywords:** Planting date, cooking quality, harvesting, growth period, sugar crops, sowing date.

Irizarry, H., M. Capiel and A. Acosta Matienzo. 1977. Yield of twelve tanier cultivars grown with and without irrigation in east-central Puerto Rico. Journal of Agriculture of the University of Puerto Rico 61(1):100-105.

Keywords: Irrigation, responses, variety trials, sugar crops.

Johns, T. 1981. The anu and the maca. Journal of Etnobiology 1(2):208-212. **Keywords:** *Tropaeolum tuberosum*, *Lepidium meyenii*, uses, cultivation.

Karikari, S.K. 1974. Cocoyam cultivation in Ghana. Ghana Farmer 18(1-2):30-35. **Keywords:** Cultivars, cooking quality, sugar crops.

León, J. 1964. The maca (*Lepidium meyenii* Walp.): A litte known food plant of Peru. Economic Botany 18(2):122-127. **Keywords:** Uses, cultivation.

Lu, A.N., T.C. Kao., P.N. Dah and T.S. Hong. 1985. Studies on the agronomic characteristics of edible *Canna* tubers. Bulletin of Taichung District Agricultural Improvement Station No. 10:101-104. **Keywords:** Leaves, colour, tubers, root crops.

Luciani, J.F. and J.R. Barrios. 1985. Preliminary observations on spontaneous flowering and fructification in *Xanthosoma sagittifolium* Schott. Revista de la Facultad de Agronomia, Universidad Central de Venezuela Alcance No. 33:269-279. **Keywords:** Flowering, seed production, induction, cultivars, root crops.

Lugo, M.d.L., E. Acevedo., L.C. Liu., N.M. Acin and L.L.M. de. 1998. Oxyfluorfen in 'Estela' and 'Alela' tanier. Journal of Agriculture of the University of Puerto Rico 82(3-4):221-223. **Keywords:** Phytotoxicity, herbicides, weed control, chemical control, crop yield, crop plants as weeds, root crops.

Melo, Z.L.d.O. and C.R. Bueno. 2000. Development of yam beans in a floodplain area. Horticultura Brasileira 18(1):9-15. **Keywords:** Inflorescences, pruning, staking, metabolism, chlorophyll.

Mercado Silva, E., R. Garcia., A. Heredia Zepeda and M. Cantwell. 1998. Development of chilling injury in five jicama cultivars. Postharvest Biology and Technology 13(1):37-43. **Keywords:** Storage disorders, chilling injury, cold storage, cultivars, texture, respiration.

Mochida, H., T. Kobayashi and H. Niimi. 1999. Growth and yield of sugar producing yacon in southern Kyushu. Report of the Kyushu Branch of the Crop Science Society of Japan No. 65:63-65. **Keywords:** Yields, fertilizers, nitrogen, phosphorus, potassium, cultivars.

Mora, Q.A., M.J. Morera., F. Cadima., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. Evaluation of yield of two cultivars of yam beans (*Pachyrhizus erosus* (L.) Urban) in association with a cultivar of cassava (*Manihot esculenta* Crantz). Proceedings of the 2nd International Symposium on Tuberous Legumes Guanajuato, Mexico, 5-8 August 1996. 1998, 191-203. **Keywords:** Cassava, yields, cropping systems, intercropping, crop yield.

Morera, M.J., Q.A. Mora., F. Cadima., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. A study of growth and development of plants of yam beans (*Pachyrhizus erosus* (L.) Urban) in association with a cultivar of cassava (*Manihot esculenta* Crantz). Proceedings of the 2nd International Symposium on Tuberous Legumes GuanajuatoMexico, 5-8 August 1996. 1998, 205-219. **Keywords:** Cassava, cropping systems, intercropping, growth, cultivars.

Nakanishi, Y., H. Toyohara., M. Miyata and M. Amano. 1994. Traditional cultivation and cropping patterns in Papua New Guinea. 1. Rational diversity of shifting cultivation systems in sparsely populated areas. Japanese Journal of Tropical Agriculture 38(4):328-334. **Keywords:** Erosion, diversity, sago, cropping systems, cultural methods, traditional farming, genetic diversity, yams.

Nielsen, P.E., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. Reproductive pruning in *Pachyrhizus ahipa* (Wedd.) Parodi. Proceedings of 2nd International Symposium on Tuberous Legumes Guanajuato, Mexico, 5-8 August 1996. 1998, 245-251. **Keywords:** Pruning, variety trials, yields, root crops.

Nielsen, P.E., M. Halafihi., M. Sorensen., O. Stolen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. Pruning practices in *Pachyrhizus tuberosus* (Lam.) Spreng. Proceedings of the 2nd International Symposium on Tuberous Legumes Guanajuato, Mexico, 5-8 August 1996. 231-244. **Keywords:** Dry matter, pruning, crop yield, flowers.

Olasantan, F.O. 1990. The response of cocoyam, *Xanthosoma sagittifolium* (L.) Schott, to row arrangement, maize intercrop, and frequency of young leaf harvest. Beitrage zur Tropischen Landwirtschaft und Veterinarmedizin 28(1):49-58. **Keywords:** Leaves, removal, intercropping, cocoyam, maize.

Onokpise, O.U., M. Boya Meboka and J.G. Wutoh. 1992. Hybridisation and fruit formation in macabo cocoyam (*Xanthosoma sagittifolium* (L.) Schott). Annals of Applied Biology 120(3):527-535. **Keywords:** Plant morphology, plant growth regulators, seed morphology, seed production, yield components, hybridization, pollination.

Pearsall, D.M. 1988. La producción de alimentos en Real Alto: la aplicación de las técnicas etnobotánicas al problema de la subsistencia en el período formativo ecuatoriano. Biblioteca Ecuatoriana de Arqueología,

Corporación Editora Nacional. Quito, Ecuador. 234 p. **Keywords:** *Zea mays*, *Canavalia*, *Canna edulis*, archaeology, achira, maize, crop history, Ecuador.

Pietila, L. and P. Jokela. 1990. Seed set of ulluco (*Ullucus tuberosus* Loz.). Variation between clones and enhancement of seed production through the application of plant growth regulators. Euphytica 47(2): 139-145. **Keywords:** Root vegetables, genetic differences, seed production, growth regulators, yield components, root crops, growth retardants.

Pietila, L., P. Jokela and J. Salo. 1990. Seed of *Ullucus tuberosus* - an apomict or not. Euphytica 47(2):117-120. **Keywords:** Root vegetables, biotechnology, polymorphism, malate dehydrogenase, aspartate aminotransferase, sexual reproduction, apomixis, isoenzymes, root crops.

Pietila, L. and P. Jokela. 1994. Developmental abnormalities in the ovule and embryo sac of ulluco (*Ullucus tuberosus*) and their effect on seed set. Euphytica 75(1-2):31-39. **Keywords:** Root vegetables, reproduction, plant embryos, sexual reproduction, ovules, embryo sac, abnormal development, fertility, embryology, root crops.

Pietila, L. 1995. Pollination requirements for seed set in ulluco (*Ullucus tuberosus*). Euphytica 84(2):127-131. **Keywords:** Seed set, pollination, requirements, hybrid seed production, outcrossing, root crops.

Plchova, R. 1997. *Polymnia sonchifolia* (Poepp. et Endl.) and its growing in Czech Republic. Agricultura Tropica et Subtropica No. 30:61-69. **Keywords:** Cultural methods, ecotypes, plant morphology, vegetables.

Plucknett, D.L. 1978. Tolerance of some tropical root crops and starch-producing tree crops to suboptimal land conditions. In Crop Tolerance to Suboptimal Land Conditions No.32:125-144. **Keywords:** Soil fertility, responses, root crops, starch crops, soil water regimes, tropics.

Popenoe, H.L. 1992. New crops for South America's farmers. Acta Horticulturae No. 318:209-210. **Keywords:** Flavour, cherimoyas, tamarillos, production possibilities, *Arracacia xanthorrhiza*, *Ullucus tuberosus*, fruit vegetables, subtropical crops.

Ratanadilok, N., K. Suriyawan., S. Thanaisawanrayangkura., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. Yam bean (*Pachyrhizus erosus* (L.) Urban) and its economic potential. Proceedings of 2nd International Symposium on Tuberous Legumes Guanajuato, Mexico, 5-8 August 1996. 1998, 261-273. **Keywords:** Nutritive value, characteristics, cultivars, quality, yields, landraces, protein content, variety trials, evaluation, characterization.

Ray, P.K., S. Mishra and S.S. Mishra. 1982. Yes, yam bean can yield more. Intensive Agriculture 20(2):8-9. **Keywords:** Cultivars, *Pachyrhizus*.

Rea, J. and J. León. 1965. La mauka (*Mirabilis expansa* Ruiz & Pavon), un aporte de la agricultura andina prehispánica de Bolivia. Anales Científicos Universidad Nacional Agraria, Lima, Perú 3(1):38-41. **Keywords:** Mauka, cultivation, Bolivia.

Rea, J. 1982. El miso (Mirabilis expansa): Una contribución de la agricultura pre-inca de Ecuador y Bolivia. Desde el Surco (Ecuador) 23: 26. **Keywords:** Cultivation, uses, genetic resources.

Rehm, S. and G. Espig. 1991. The cultivated plants of the tropics and subtropics. Cultivation, economic value, utilization. Verlag Josef Margraf. Weikersheim, Germany. 552 p. **Keywords:** *Pachyrhizus erosus*, *Pachyrhizus ahipa*, *Pachyrhizus tuberosus*, use, geographic distribution.

Resende, G.M.d. and G.M. de Resende. 2000. Yield components of sweet potato cultivars harvested on two dates in Porteirinha, Minas Gerais. Horticultura Brasileira 18(1):68-71. **Keywords:** Cultivars, sweet potatoes, harvesting date.

Rousi, A., J. Salo., R. Kalliola., P. Jokela., L. Pietila and M. Yli Rekola. 1986. Variation pattern in ulluco (*Ullucus tuberosus* - Basellaceae), a supposedly asexual Andean tuber crop. Acta Horticulturae No. 182:145-152. **Keywords:** Photoperiodism, flowering, sexual reproduction, genetic resources, root crops.

Rousi, A., M. Yli Rekola., P. Jokela., R. Kalliola., L. Pietila and J. Salo. 1988. The fruit of *Ullucus* (Basellaceae), an old enigma. Taxon 37(1):71-75. **Keywords:** Sexual reproduction, seed production, root crops.

Rousi, A., P. Jokela., R. Kalliola., L. Pietila., J. Salo and M. Yli Rekola. 1989. Morphological variation among clones of ulluco (*Ullucus tuberosus*, Basellaceae) collected in southern Peru. Economic Botany 43(1):58-72. **Keywords:** Genetic resources, root vegetables, chromosome number, sexual reproduction, morphology, root crops.

Salick, J. 1989. Ecological basis of Amuesha agriculture, Peruvian upper Amazon. Adv. Econ. Bot. 7:189-212. **Keywords:** Peru, *Manihot esculenta*, cassava, *Xanthosoma*, *Ipomoea batatas*, sweet potato, *Pachyrhizus*, yam bean, *Dioscorea*, yam, use, agroforestry, agronomy.

Saray Meza, C.R. and A. Palacios Alvarez. 1980. The effect of soil moisture on the yield and form of roots of the yam bean (*Pachyrhizus erosus* L.). Chapingo No. 21-22:17-23. **Keywords:** Irrigation, tubers, *Pachyrhizus*.

Sen, H. and S.K. Mukhopadhyay. 1989. Effect of nitrogen and potassium on tuber yield and quality of yam bean (*Pachyrrhizus erosus*). Journal of Root Crops 15(1):33-37. **Keywords:** Fertilizers, nitrogen, potassium, nitrogen fertilizers, potassium fertilizers.

Sivan, P., C.J. Asher., F.P.C. Blamey., E.T. Craswell and O.S. JN. 1996. Effects of potassium on drought tolerance of taro and tannia. Mineral nutrient disorders of root crops in the Pacific: Proceedings of a workshop Kingdom of Tonga 17-20 April 1995. 1996, 100-104. **Keywords:** Mineral deficiencies, drought resistance, mineral nutrition, stomatal resistance, leaf area, *Dioscorea*, *Canna*.

SK, O.H., J. Janick and J.E. Simon. 1990. Tropical root and tuber crops. Advances in new crops developmenteconomics', Indianapolis, Indiana, USA, 23-26 October 1988. 1990, 424-428. **Keywords:** Cassava, production possibilities, sweet potatoes, yams.

Smole, W.J. 1989. Yanoama horticulture in the Parima highlands of Venezuela and Brazil. Adv. Econ. Bot. 7:115-128. **Keywords:** Amazon, Orinoco, *Manihot esculenta*, cassava, bitter, *Xanthosoma*, sweet potato, *Ipomoea batatas*, forest, *in situ* conservation.

Tanaka, N. 1998. Economic botanical notes on edible *Canna* (Cannaceae) in South Vietnam. Journal of Japanese Botany 73(6):319-324. **Keywords:** Crop management, production possibilities, consumption, tannia, economics, rhizomes, utilization.

Terrazas, F. and G. Valdivia. 1998. Spatial dynamics of *in situ* conservation: handling the genetic diversity of Andean tubers in mosaic systems. Plant Genetic Resources Newsletter No. 114:9-15. **Keywords:** *In situ* conservation, genetic diversity, cultivars, germplasm, microclimate, phenotypic variation.

Trognitz, B.R., S. Carrion and M. Hermann. 2000. Expression of stylar incompatibility in the Andean clonal tuber crop oca (*Oxalis tuberosa* Mol., Oxalidaceae). Sexual Plant Reproduction 13(2):105-111. **Keywords:** Incompatibility, anthers, flowers, fertility, pollen germination.

Trujillo, L.E., J.G. Arrieta., G.A. Enriquez., F. Dafhnis., A.D. Fuentes., R. Garcia., M. Soto., D. Alfonso., A. Banguela., L. Hernandez and A.D. Arencibia. 1999. Strategies for fructan production in transgenic sugarcane (*Saccharum* spp. L.) and sweet potato (*Ipomoea batatas* L.) plants expressing the Acetobacter diazotrophicus levansucrase. Plant genetic engineering: towards the third millennium: Proceedings of the International Symposium on Plant Genetic Engineering, Havana, Cuba. 5-7p. **Keywords:** Sugarcane, sweet potatoes, transgenic plants, gene expression, recombinant proteins, sugar crops; biotechnology.

Vaz, F., J.B.V.d. Silva., M.C. Matos., J.B.V. da Silva., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. Yield of yam bean, *Pachyrhizus ahipa* (Wedd.) Parodi, in a Mediterranean climate. Proceedings of the 2nd International Symposium on Tuberous Legumes Guanajuato, Mexico, 5-8 August 1996. 1998, 285-290. **Keywords:** Mediterranean climate, fertilizers, pruning, nitrogen fixation, flowers, removal, landraces.

Williams, L.O. 1978. The anu in Mexico. Economic Botany 32(1):104. **Keywords:** *Tropaeolum tuberosum*, cultivation.

Wiseman, F.M. 1978. Agricultural and historical ecology of the Maya lowlands. Pp. 63-115 *In* Pre-Hispanic Maya agriculture. (P.D. Harrison and B.L. Turner II (eds.)). University of New Mexico Press, Albuquerque, New Mexico, USA. **Keywords:** *Pachyrhizus erosus*, yam bean, archaeology, Peten, Guatemala, Maya.

Yamaguchi, M. 1983. World vegetables - Principles, production and nutritive values. Ellis Horwood Ltd. Publishers. Chichester, United Kingdom. 415 p. **Keywords:** *Pachyrhizus tuberosus*, *Pachyrhizus ahipa*, *Pachyrhizus erosus*, use, plant morphology, *Xanthosoma*, *Dioscorea*, *Manihot*, *Ipomoea*, *Sechium*.

PLANT PHYSIOLOGY

Adjahossou, D.F., J. Ade., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. Some aspects of mechanisms of drought tolerance in two genotypes of *Pachyrhizus erosus* (L.) Urban and one genotype of *Pachyrhizus tuberosus* (Lam.) Sprengel. *In* Proceedings of the 2nd International Symposium on Tuberous Legumes. Guanajuato, Mexico. 5-8 August 1996. 361-375. **Keywords:** Drought, genotypes, stomata, transpiration, plant water relations, stomatal resistance, plant breeding.

Adjahossou, D.F., J. Ade., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. Effects of inflorescence removal on tuber yield of some accessions of *Pachyrhizus erosus* (L.) Urban and *P. tuberosus* (Lam.) Sprengel. *In* Proceedings of the 2nd International Symposium on Tuberous Legumes. Guanajuato, Mexico. 5-8 August 1996. 97-114. **Keywords:** Harvesting date, pruning, cultivars, yields, crop yield, flowers, removal, tubers, plant breeding.

Agrawal, M., R. Kumar and A. Prasad. 1995. Floral variability in *Canna* varieties. Recent Horticulture 2(2):124-126. **Keywords:** Ornamental bulbs, cultivars, variety trials, flowering, ornamental plants, physiology.

Agueguia, A. and C.A. Fatokun. 1988. Pollen storage in cocoyam (*Xanthosoma sagittifolium* (L.) Schott). Euphytica 39(3):195-198. **Keywords:** Root vegetables, pollen, storage, root crops, germplasm.

Amar, C. and A. Chandra. 1997. Yield prediction of sweet potato (*Ipomoea batatas* Poir) based on physiological and yield parameters. JNKVV Research Journal 31:1-2. **Keywords:** Sweet potatoes, growth rate, leaf area index, yield correlations, crop yield.

Berlingeri, G.C. and T.D. Jauregui. 1999. Leaf anatomy of two species of *Pachyrhizus*: *P. erosus* (L.) Urban and *P. tuberosus* (Lam.) Spreng. Anales de Botanica Agricola 6:51-59. **Keywords:** Parenchyma, cultivars, leaves, anatomy, stomata, trichomes.

Bikomo, M.R. 1994. Influence of variety, maturity at harvest, chlorination, and packaging on cocoyam (*Xanthosoma* spp.) in storage. Tropical root crops in a developing economy held at Accra Ghana, 20-26 Oct. 1991. Acta-Horticulturae. 1994, No. 380:478-482. **Keywords:** Storage decay, dry matter, palatability, harvesting, cultivars, storage, moisture content.

Cortella, A.R. and M.L. Pochettino. 1995. Comparative morphology of starch of three Andean tubers. Starch Starke 47(12):455-461. **Keywords:** Plant morphology, archaeology, tuberous species, starch, *Oxalis tuberosa*, *Ullucus tuberosus*, *Tropaeolum tuberosum*.

Council, N.R. 1989. Lost crops of the Incas: little known plants of the Andes with promise for worldwide cultivation. National Academy Press. Washington, D.C., USA. 415 p. **Keywords:** *Pachyrhizus ahipa*, ajipa, botany, use, nutritional value, physiology, nutrition, *Arracacia xanthorrhiza.*

Desfontaines, L., V. Vaillant., P. Constant., M. Unterstock., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. Changes in soluble carbohydrates and activities of sucrose-cleaving enzymes during tuberisation of *Pachyrhizus erosus* (L.) Urban. Proceedings of the 2nd International Symposium on Tuberous Legumes Guanajuato, Mexico, 5-8 August 1996. 399-406p. **Keywords:** Carbohydrates, fructose, sucrose synthase, metabolism, enzyme activity.

Desveaux, D., F. Ahmed., G. Maclachlan and A. Faik. 1998. Fucosyltransferase and the biosynthesis of storage and structural xyloglucan in developing nasturtium fruits. Plant Physiology 118(3):885-894. **Keywords:** Biosynthesis, transferases, enzyme activity, metabolism, plant development, *Tropaeolum majus*.

Diouf, O., H. Roy Macauley., D.J.M. Annerose., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. Tuber-pod competition and drought responses in yam bean (*Pachyrhizus ahipa* (Wedd.) Parodi). Proceedings of the 2nd International Symposium on Tuberous Legumes Guanajuato, Mexico, 5-8 August 1996. 407-412p. **Keywords:** Drought, inflorescences, photosynthesis, pruning, transpiration, water transfer, stomatal resistance, water content.

El Shabasi, M.S.S. and M.K. El Bahr. 1999. Effect of potassium and nitrogen sources in tissue cultures of sweet potato. Egyptian Journal of Horticulture 26(3):267-279. **Keywords:** Plant nutrition, sweet potatoes, cultivars, culture media, *in vitro* culture.

Feofilova, G.F. 1975. Evaluation of some results of garden *Canna* pollen analysis. Byulleten' Gosudarstvennogo Nikitskogo Botanicheskogo Sada No.3(28):1-23. **Keywords:** Pollen, research, ornamental plants.

Goenaga, R., V. Chew., S. Upendra and U. Singh. 1991. Estimation of leaf area in three tanier (*Xanthosoma* spp.) cultivars grown in Puerto Rico. Journal of Agriculture of the University of Puerto Rico 75(3): 13-315. **Keywords:** Leaf area, estimation.

Graven, P., C.G.d. Koster., J.J. Boon., F. Bouman and C.G. De Koster. 1997. Functional aspects of mature seed coat of the Cannaceae. Plant Systematics and Evolution 205(3-4):23-240. **Keywords:** Seed germination, imbibition, plant composition, anatomy, physiology, seed anatomy, ultrastructure.

Harrington, K.C. and V.T. Fakava. 1993. Herbicide tolerance of garden nasturtium (*Tropaeolum majus*). Proceedings of the Forty Sixth New Zealand Plant Protection Conference New Zealand 0-12 August 1993. 1993, 49-52. **Keywords:** Tolerance, herbicides, damage, seed germination, herbaceous plants.

Le, T.S. 1972. Cytoplasmic particles in *Tropaeolum majus*. Planta 106(3):27-236. **Keywords:** Cytology, ornamental plants.

Jos, J.S., K.V. Bai and N. Hrishi. 1980. Female fertility in tannia. Annals of Botany 45(1):23-125. **Keywords:** Female sterility, flowering, pollination, *Canna*.

K.Y. Kim., H.K. Kwon., S.Y. Kwon., H.S. Lee., Y.K. Hur., J.W. Bang., K.S. Choi and S.S. Kwak. 2000. Differential expression of four sweet potato peroxidase genes in response to abscisic acid and ethephon. Phytochemistry 54(1):9-22. **Keywords**: Ascisic acid, genes, sweet potatoes, cell culture, plant growth regulators, gene expression, root crops, growth inhibitors.

Kjaer, S. 1992. Biological nitrogen fixation in *Pachyrhizus ahipa* (Wedd.) Parodi. Ann. Bot. 70:11-17. **Keywords:** Yam bean, physiology.

Li, X., J. Hou., L. Shao., W. Yin., X.Z. Li., J.Z. Hou., L.M. Shao and W.Y. Yin. 1994. Physiological, biochemical and

cytological changes in senescing corolla of four-o'clock flower (*Mirabilis jalapa* L.). Acta Botanica Sinica 36(2): 116-122. **Keywords:** Cytology, flowers, senescence, physiology, starch, proteins, plant growth regulators, ethylene.

Lovett Doust, L., J. Lovett Doust and P. Cavers. 1981. Fertility relationships in closely related taxa of *Oxalis*, section *Corniculatae*. Can. J. Bot. 59:2603-2609. **Keywords:** Weed biology, taxonomy, *Oxalis corniculata.*

Nedunzhiyan, M. and R.C. Ray. 1996. Leaflet area estimation in yam bean. Journal of Root Crops 22(2):128-134. **Keywords:** Leaves, plant morphology, regression analysis, growth rate, *Pachyrhizus*.

Niesenbaum, R.A. and S.K. Schueller. 1997. Effects of pollen competitive environment on pollen performance in *Mirabilis jalapa* (Nyctaginaceae). Sexual Plant Reproduction 10(2):101-106. **Keywords:** Pollen competition, medicinal plants, stigma, selective fertilization, pollen germination, physiology.

Niesenbaum, R.A. 1999. The effects of pollen load size and donor diversity on pollen performance, selective abortion, and progeny vigor in *Mirabilis jalapa* (Nyctaginaceae). American Journal of Botany 86(2):261-268. **Keywords:** Pollen germination, plant ecology, pollen competition.

Niu, J., H. Bai., L. Li., X. Zhang., Sodmergen., J.G. Niu., H.H. Bai., L.J. Li and X. Zhang. 1999. Dynamic association between the vegetative nucleus and the generative cell in *Tropaeolum majus* (Tropaeolaceae). Cytologia 64(2):215-221. **Keywords:** Nuclei, endoplasmic reticulum, electron microscopy, hydration, pollen germination, ultrastructure.

Otto, H.W., P. Gebauer., H.J. Hardtke and K. Moravkova. 1999. Floristic monitoring during 1997 and 1998 in Oberlausitz and Elbhugelland. Berichte der Naturforschenden Gesellschaft der Oberlausitz 861-94. **Keywords:** Geographical distribution, new geographic records, flora.

Prasad, D. and R. Prakash. 1973. Floral biology of yam-bean, *Pachyrhizus erosus* (L.) Urb. Indian Journal of Agricultural Sciences 43(6):531-535. **Keywords:** Flowering, vegetables.

Quiros, C.F., A. Epperson., J. Hu and M. Holle. 1996. Physiological studies and determination of chromosome number in maca, *Lepidium meyenii* (Brassicaceae). Econ. Bot. 50(2):216-223. **Keywords:** Chromosome number, acid soils, root crops, polyploidy, photoperiodism, soil pH.

Rose, J.K.C., D.A. Brummell and A.B. Bennett. 1996. Two divergent xyloglucan endotransglycosylases exhibit mutually exclusive patterns of expression in nasturtium. Plant Physiology 110(2): 493-499. **Keywords:** Molecular genetics, plant tissues, genes, nucleotide sequences, gene expression, physiology, biotechnology, *Tropaeolum majus*.

Ruel, K., J.P. Joseleau and G. Franz. 1990. Cytological aspects of the formation of xyloglucans in the cotyledons of seeds of *Tropaeolum majus* L. (nasturtium). Comptes Rendus de l'Academie des Sciences. Series 3, Sciences de la Vie 310(3):89-95. **Keywords:** Cell walls, seeds, development, biochemistry, cytology, metabolism, plant physiology, carbohydrates.

Shayk, M., P.E. Kolattukudy and R. Davis. 1977. Production of a novel extracellular cutinase by the pollen and the chemical composition and ultrastructure of the stigma cuticle of nasturtium (*Tropaeolum majus*). Plant Physiology 60(6):907-915. **Keywords:** Pollination, biochemistry, enzyme activity, pollen.

Souza, J.G., A.T.P. Thi., J.V.d. Silva., A. Tashakorie., J.V. da Silva., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. Ecophysiology of three ahipa yam bean (*Pachyrhizus ahipa* (Wedd.) Parodi) landraces. Proceedings of 2nd International Symposium on Tuberous Legumes, Guanajuato, Mexico, 5-8 August 1996. 523-531p. **Keywords:** Biomass, chloroplasts, photosynthesis, respiration, water content, plasma membranes, drought resistance, landraces.

Tiwari, S.C. and B.E.S. Gunning. 1986. Development and cell surface of a non-syncytial invasive tapetum in *Canna*: ultrastructural, freeze-substitution, cytochemical and immunofluorescence study. Protoplasma 134(1):1-16. **Keywords:** Pollen, ultrastructure, chemica composition.

Tiwari, S.C. and B.E.S. Gunning. 1986. Development of tapetum and microspores in *Canna* L.: an example of an invasive but non-syncytial tapetum. Annals of Botany 57(4): 557-563. **Keywords:** Pollen, development, cytology.

Torres, O., T.J. Fandiño and M. Perea. 1989. Aspectos anatómicos y fisiológicos de cultivos *in vitro* de *Tropaeolum tuberosum* (Ruiz & Pavón). Acta Biol. Colombiana 1(5):71-79. **Keywords:** Physiology*, in vitro* culture.

Venthou Dumaine, A., V. Vaillant., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. Comparative development of three species of yam bean (*Pachyrhizus erosus* (L.) Urban, *P. tuberosus* (Lam.) Spreng. and *P. ahipa* (Wedd.) Parodi). Proceedings of the 2nd International Symposium on Tuberous Legumes, Guanajuato, Mexico, 5-8 August 1996. 291-296p. **Keywords:** Dry matter accumulation, dry matter distribution, phenology, plant development.

Vierheilig, H., R. Bennett., G. Kiddle., M. Kaldorf and J. Ludwig Muller. 2000. Differences in glucosinolate patterns and arbuscular mycorrhizal status of glucosinolate-containing plant species. New Phytologist 146(2):343-352. **Keywords:** Cultivars, glucosinolates, host plants, pawpaws, vesicular arbuscular mycorrhizas, fruit crops.

Yabuta, Y., K. Yoshimura., T. Takeda and S. Shigeoka. 2000. Molecular characterization of tobacco mitochondrial L-galactono-gamma-lactone dehydrogenase and its expression in Escherichia coli. Plant and Cell Physiology 41(6):666-675. **Keywords:** Tobacco, complementary DNA, genetic transformation, sweet potatoes, amino acid sequences, cauliflowers, nucleotide sequences, gene expression.

Yun., G.H. Huh., H.S. Lee., S.Y. Kwon., J.K. Jo., J.S. Kim., K.Y. Cho and S.S. Kwak. 2000. Differential resistance to methyl viologen in transgenic tobacco plants that express sweet potato peroxidases. Journal of Plant Physiology 156(4): 504-509. **Keywords:** Peroxidases, sweet potatoes, tobacco, transgenic plants, isoenzymes, genetic transformation, genetic engineering, biotechnology.

ENTOMOLOGY

Alavez Solano, D., J.R. Reyes Chilpa., M.A. Jimenez Estrada., M.A. Villavicencio., B.E. Perez Escandon., F. Gomez Garibay., M. Sorensen., E.J.Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. Study on the insecticidal activity of seeds of *Pachyrhizus erosus* (L.) Urban. Proceedings of the 2nd International Symposium on Tuberous Legumes, Guanajuato, Mexico, 5-8 August 1996. 535-548p. **Keywords:** Medicinal plants, insecticidal plants, insecticidal properties, plant composition, plant extracts, cultivars, pesticidal plants, agricultural entomology.

Galhano, C.I.C., M.F. Ryan., M.d. Santos., G. Staritsky and M. De Santos. 1997. Interactions between tannia (*Xanthosoma sagittifolium*) and the root-knot nematodes, *Meloidogyne megadora* and *M. javanica*. Nematropica 27(1):7-17. **Keywords:** Plant parasitic nematodes, interactions, plant extracts, nematicidal plants, chemical control, plant nematology.

Garcia, R., R. Moran., J. Mena., D. Somontes., E. Pimentel., Z. Zaldua., A. Lopez., M. Garcia and A.D. Arencibia. 1999. Sweet potato (*Ipomoea batatas* L.) regeneration and transformation technology to provide weevil (*Cylas formicarius*) resistance. Field trial results. Plant genetic engineering: towards the third millennium: Proceedings of the International Symposium on Plant Genetic Engineering, Havana, Cuba. **Keywords:** *In vitro* regeneration, genetic transformation, plant growth regulators, pest resistance, tissue culture, gene expression, sweet potatoes, biotechnology, agricultural entomology.

Grum, M., M. Halafihi., O. Stolen and M. Sorensen. 1994. Yield performance of yam bean in Tonga, South Pacific. Experimental Agriculture 30(1):67-75. **Keywords:** Varietal reactions, starch crops, proteins, insect pests, yields, variety trials, resistance, composition, pest resistance, agricultural entomology.

Kumar, R. 1989. Biology and management of root and tuber pests in tropical Africa. Discovery and Innovation 1(4):44-49. **Keywords:** Quarantine, insecticides, chemical control, biological control, cassava, yams, sweet potatoes, arthropod pests, pest control, agricultural entomology.

Reinert, J.A., T.K. Broschat and H.M. Donselman. 1983. Resistance of *Canna* spp. to the skipper butterfly, *Calpodes ethlius* (Lepidoptera: Hesperiidae). Environmental Entomology 12(6):1829-1832. **Keywords:** Varietal susceptibility, food plants, cultivars, pest resistance, pest control, agricultural entomology.

Shideler, F.S. and H. Rincon. 1984. Proceedings: sixth symposium of the International Society for Tropical Root Crops, Lima, Peru, 21-26 February, 1983. **Keywords:** Tropics, root crops, agricultural entomology.

ROOTS AND TUBERS CHEMICAL COMPOSITION

Agbor Egbe, T. and J.E. Rickard. 1990. Evaluation of the chemical composition of fresh and stored edible aroids. Journal of the Science of Food and Agriculture 53(4):487-495. **Keywords:** Corms, plant composition, storage, proteins, sugars, starch, amino acids, biochemistry.

Balsac, H.H.d. and D. Leroux. 1945. Le tubercule alimentaire d'oca - oxalide du Pérou. C. R. Acad. Agric. France 31(6):373-375. **Keywords:** *Oxalis tuberosa*, oca, food analysis, proteins, food conservation, Peru, Bolivia.

Bolle, M.F.C.d., F.R.G. Terras., B.P.A. Cammue., S.B. Rees., W.F. Broekaert., M.F.C. De Bolle., B. Fritig and M. Legrand. 1993. *Mirabilis jalapa* antibacterial peptides and *Raphanus sativus* antifungal proteins: a comparative study of their structure and biological activities. Mechanisms of plant defense responses p 433-436 *In* Proceedings of the 2nd International Conference of the European Foundation for Plant Pathology. Strasbourg, France, 24-27 August 1992. **Keywords:** Peptides, radishes, antifungal properties, antibacterial properties, plant composition, proteins.

Bolle, M.F.C.d., K. Eggermont., R.E. Duncan., R.W. Osborn., F.R.G. Terras., W.F. Broekaert and M.F.C. De Bolle. 1995. Cloning and characterization of two cDNA clones encoding seed-specific antimicrobial peptides from *Mirabilis jalapa* L. Plant Molecular Biology 28(4):713-721. **Keywords:** Complementary DNA, characterization,

clones, amino acid sequences, antimicrobial properties, nucleotide sequences, gene expression, seeds, composition, proteins, biotechnology.

Carlson, K.D. and R. Kleiman. 1993. Chemical survey and erucic acid content of commercial varieties of nasturtium, *Tropaeolum majus* L. Journal of the American Oil Chemists' Society 70(11):1145-1148. **Keywords:** Seed oils, fatty acids, erucic acid.

Chowdhury, B. and M. Hussain. 1979. Chemical composition of the edible parts of aroids grown in Bangladesh. Indian Journal of Agricultural Sciences 49(2):110-115. **Keywords:** Vegetables, plant composition, protein, starch, ascorbic acid, altitude, fatty oil plants.

Comerford, S.C. 1996. Medicinal plants of two Mayan healers from San Andrés, Petén, Guatemala. Econ. Bot. 50(3):327-336. **Keywords:** Use, ethnobotany, *Annona reticulata*, *Annonas quamosa*, *Carica papaya*, *Byrsonima crassifolia*, nance, *Pimenta dioica*, *Psidium guajava*, guayava, *Mirabilis jalapa*, *Pouteria sapota*, *Nicotiana tabacum*, tobacco, Sapotaceae.

Council, N.R. 1979. Tropical legumes: resources for the future. National Academy of Sciences. Washington, D.C., USA. 332 p. **Keywords:** *Phaseolus lunatus*, *P. acutifolius*, *Pachyrhizus erosus*, tuberosus, lima bean, yam bean, tepary bean, *Canavalia ensiformis*, use, nutrition, *Erythrina edulis* .

Du, L., B.A. Halkier and L.C. Du. 1996. Isolation of a microsomal enzyme system involved in glucosinolate biosynthesis from seedlings of *Tropaeolum majus* L. Plant Physiology 111(3):831-837. **Keywords:** Seedlings, biosynthesis, enzymes, metabolism, *in vitro* culture, ascorbic acid, plant composition, biochemistry.

Espinoza, F., Y. Diaz., P. Argenti., E. Perdomo., L. Leon., M. Sorensen., E.J. Estrella., O.J. Hamann and S.A. Rios Ruiz. 1998. Preliminary studies of the genus *Pachyrhizus* DC in Venezuela. Proceedings of 2nd International Symposium on Tuberous Legumes, Guanajuato, Mexico, 5-8 August 1996. 139-154p. **Keywords:** Protein content, evaluation, plant density, crop husbandry, variety trials, root crops.

Fanutti, C., M.J. Gidley and J.S.G. Reid. 1996. Substrate subsite recognition of the xyloglucan endo-transglycosylase or xyloglucan-specific endo-(1<right arrow>4)-beta-D-glucanase from the cotyledons of germinated nasturtium (*Tropaeolum majus* L.) seeds. Planta 200(2):221-228. **Keywords:** Seeds, metabolism, enzyme activity, hydrolysis, seedlings, biochemistry.

Fernandez, C.E., H. Lipavska and J. Michl. 1997. Determination of saccharides content in different ecotypes of yacon (*Polymnia sonchifolia* Poeppig and Endlicher) cultivated under conditions of Czech Republic. Agricultura Tropica et Subtropica No. 30:79-87. **Keywords:** Food products, inulin, fructose, plant composition, tubers, vegetables.

Fernandez, M.V., W.A. Warid., J.M. Loaiza and C.A. Montiel. 1997. Developmental patterns of jicama (*Pachyrhizus erosus* (L.) Urban) and the chemical constituents of roots grown in Sonora, Mexico. Plant Foods for Human Nutrition 50(4):279-286. **Keywords:** Growth, plant composition, chemical composition, proteins.

Flores, H.E., T. Flores., T. Johns and J.T. Romeo. 1997. Biology and biochemistry of underground plant storage organs. Functionality of food phytochemicals. **Keywords**: Root crops, plant composition, proteins, potatoes, sweet potatoes.

Fukai, K., S. Miyazaki., F. Nanjo and Y. Hara. 1993. Distribution of carbohydrates and related enzyme activities in yacon (*Polymnia sonchifolia*). Soil Science and Plant Nutrition 39(3):567-571. **Keywords:** Plant composition, enzyme activity, carbohydrates.

Fukai, K., S. Ohno., K. Goto., F. Nanjo and Y. Hara. 1997. Seasonal fluctuations in fructan content and related enzyme activities in yacon (*Polymnia sonchifolia*). Soil Science and Plant Nutrition 43(1):171-177. **Keywords:** Fructans, plant, biochemistry, seasonal variation, polysaccharides, metabolism, enzyme activity, vegetables.

Gomes, A.V., G. Sirju Charran and J.A. Barnes. 1997. Major proteins of yam bean tubers. Phytochemistry 46(2):185-193. **Keywords:** Proteinases, glycoproteins, proteinase inhibitors, plant composition.

Gruneberg, W.J., F.D. Goffman and L. Velasco. 1999. Characterization of yam bean (*Pachyrhizus* spp.) seeds as potential sources of high palmitic acid oil. Journal of the American Oil Chemists' Society 76(11):1309-1312. **Keywords:** Palmitic acid, seeds, characterization, fatty acids, linolenic acid, chemical composition, proteins.

Hu, M.F. 1983. Studies on the agronomic characteristics and starch contents of two edible *Canna* varieties. Journal of Agricultural Research of China 32(4): 336-340. **Keywords:** Yield components, plant composition, starch.

Ikeda, T., K. Niino., J. Kataoka and T. Matsumoto. 1987. Effects of nutritional and hormonal factors on the formation of anti-plant-viral protein by *Mirabilis jalapa* L. cells in suspension culture. Agricultural and Biological Chemistry 51(11):3119 -3124. **Keywords:** Tissue culture, biochemistry, culture media, antiviral properties, growth regulators, proteins, composition, pesticidal plants.

Indira, P., A. Mukherjee., G.T. Kurup., M.S. Palaniswami., V.P. Potty., G. Padmaja., S. Kabeerathumma and S.V. Pillai. 1996. Flowering behaviour in aroids and the associated physiological changes. Tropical tuber crops: problems, prospects and future strategies. 280-288 p. **Keywords:** Ascorbic acid, gibberellic acid, flowering,

respiration, nitrate reductase, starch, proteins, plant composition, enzyme activity, plant growth regulators.

Isla, M.I., M.A. Vattuone and A.R. Sampietro. 1998. Essential groups at the active site of *Tropaeolum* invertase. Phytochemistry 47(7):1189-1193. **Keywords:** Beta fructofuranosidase, proteins, characterization, plant composition, biochemistry, enzymes, ornamental herbaceous plants.

Johns, T. and G.H. Neil Towers. 1981. Isothiocyanates and thioureas in enzyme hydrolysates of *Tropaeolum tuberosum*. Phytochemistry 20(12):2687-2689. **Keywords:** *Tropaeolum tuberosum*, plant domestication, mashua, glucosinolates, nutrition, food, Andes.

Johns, T. 1988. A survey of traditional methods employed for the detoxification of food plants. J. Ethnobiol. 8(1):81-129. **Keywords:** Use, ethnobotany, *Canavalia*, *Pachyrhizus*, *Solanum*, *Tropaeolum*, *Manihot*, domestication, Andes.

King, S.R. and S.N. Gershoff. 1987. Nutritional evaluation of three underexploited Andean tubers: *Oxalis tuberosa* (Oxalidaceae), *Ullucus tuberosus* (Basellaceae), and *Tropaeolum tuberosum* (Tropaeolaceae). Economic Botany 41(4):503-511. **Keywords:** Chemical composition, genetic resources, centres of diversity.

Komaki, K. 1998. Development of new sweetpotato cultivars for new demands and their use. Improvement of chemical characteristics and addition of novel function through mutation. Report of a symposium held (37):67-79. **Keywords:** Cultivars, sweet potatoes, functional foods, nutritive value, genetic diversity, food processing, fermentation products, plant breeding, vegetables, chemical composition.

Kuruvilla, K.M. and S. Avtar. 1980. Karyotypic and electrophoretic studies on tannia. Journal of Cytology and Genetics 15(1):86-89. **Keywords:** Plant composition, protein, chromosome morphology.

Lake, J.C. and L. Hughes. 1999. Nectar production and floral characteristics of *Tropaeolum majus* L. grown in ambient and elevated carbon dioxide. Annals of Botany 84(4): 535-541. **Keywords:** Carbon dioxide, plant development, plant composition.

Maini, S.B., K.R. Lakshmi and N. Hrishi. 1981. Correlation coefficient and regression equation for dry matter and starch content in different tuber crops. Agricultural Science Digest, India 1(4):225-226. **Keywords:** Plant composition, starch, root crops, cassava, sweet potatoes.

Martin, F.W. and W.E. Splittstoesser. 1975. A comparison of total protein and amino acids of tropical roots and tubers. Tropical Root and Tuber Crops Newsletter No.8:7-15. **Keywords:** Plant composition, cassava, yams, sweet potatoes.

Martins, M., J. Pinto and E. Paiva. 1999. Purification of sporamin, a protein specific to sweet potatoes, and production of antibodies to it. Ciencia e Agrotecnologia 23(4):850-856. **Keywords:** Sweet potatoes, chromatography, metabolism, proteins, plant composition.

Morton, J.F. 1972. Cocoyams (*Xanthosoma caracu*, *X. atrovirens* and *X. nigrum*), ancient root- and leaf-vegetables, gaining in economic importance. Proceedings of the Florida State Horticultural Society publ. 197385:85-94. **Keywords:** Nomenclature, food quality, cultivars, sugar crops.

Oduro, I., W.O. Ellis., S.K. Aryeetey., K. Ahenkora and J.A. Otoo. 2000. Pasting characteristics of starch from new varieties of sweet potato. Tropical Science 40(1):25-28. **Keywords:** Starch, sweet potatoes, varieties, cultivars, physicochemical properties.

Ohyama, T., O. Ito., S. Yasuyoshi., T. Ikarashi., K. Minamisawa., M. Kubota., T. Tsukihashi and T. asami. 1990. Composition of storage carbohydrate in tubers of yacon (*Polymnia sonchifolia*). Soil Science Plant Nutrition 36 (1): 167-171. **Keywords:** Chemical composition, carbohydrates.

Perez, E., M. Lares and Z. Gonzalez. 1997. Some characteristics of sagu (*Canna edulis* Kerr) and zulu (*Maranta* sp.) rhizomes. Journal of Agricultural and Food Chemistry 45(7):2546-2549. **Keywords:** Starch, characteristics, rhizomes, plant composition, carbohydrates, protein contents.

Rashid, M.M. and H.J. Daunicht. 1979. Chemical composition of nine edible aroid cultivars of Bangladesh. Scientia Horticulturae 10(2): 127-134. **Keywords:** Plant composition, protein, ascorbic acid, phosphorus, carotenes, vitamins, fatty oil plants.

Ritchey, K.D., L.V. Ramirez., R. Goenaga and V. Chew. 1990. Rapid methods for determining tanier (*Xanthosoma* spp.) root responses to soil acidity. Journal of Agriculture of the University of Puerto Rico 74(4):365-373. **Keywords:** Soil acidity, resistance, techniques, soil pH, soil amendments, tolerance, growth.

Samson, J.A. 1972. Tropical spinach from *Amaranthus*, *Ipomoea* and *Xanthosoma*. Surinaamse Landbouw 20(1): 15-21. **Keywords:** Photoperiodism, plant composition, ascorbic acid, protein, vitamins, retinol, cultural methods, vegetables.

Sarangbin, S., Y. Watanapokasin., S. Somsak., W. Yuwadee and S. Harding. 1999. Yam bean starch: a novel substrate for citric acid production by the protease-negative mutant strain of Aspergillus niger. Special issue: Polysaccharide biotechnology 38(3):219-224. **Keywords:** Citric acid, mutants, productivity, proteinases, yams,

fermentation, biosynthesis.

Silva, J.d., C.D. Jarman., D.A. Arrowsmith., M.S. Stronach., S. Chengappa., C. Sidebottom., J.S.G. Reid and J. De Silva. 1993. Molecular characterization of a xyloglucan-specific endo-(1<right arrow>4)-beta-D-glucanase (xyloglucan endo-transglycosylase) from nasturtium seeds. Plant Journal 3(5):701-711. **Keywords:** Biotechnology, germination, genes, plant development, molecular genetics, enzymes, composition, biochemistry, biosynthesis.

Splittstoesser, W.E., F.W. Martin and A.M. Rhode. 1973. The nutritional value of some tropical root crops. Proceedings of the Tropical Region, American Society for Horticultural Science 17:290-294. **Keywords:** Yams, cassava, sweet potatoes, plant composition, protein, amino acids.

Splittstoesser, W.E. and A.M. Rhodes. 1973. Protein and amino acid values of some tropical root crops. Illinois Research 15(4):6-7. **Keywords:** Yams, sweet potatoes, cassava, plant composition, protein, amino acids, proteins.

Splittstoesser, W.E. and F.W. Martin. 1975. The tryptophan content of tropical roots and tubers. HortScience 10(1):23-24. **Keywords:** Yams, sweet potatoes, plant composition, sugar crops.

Splittstoesser, W.E. 1977. Protein quality and quantity of tropical roots and tubers. HortScience 12(4):294-298. **Keywords:** Cassava, potatoes, sweet potatoes, distribution, uses, plant composition, protein, yams.

Stegemann, H., S. Majino and P. Schmiediche. 1988. Biochemical differentiation of clones of oca (*Oxalis tuberosa*, Oxalidaceae) by their tuber proteins and the properties of these proteins. Economic Botany 42(1):37-44. **Keywords:** Variety classification, techniques, plant composition, proteins.

Tamer, I.M. and F. Mavituna. 1997. Protease from freely suspended and immobilised *Mirabilis jalapa*. Process Biochemistry 32(3):195-200. **Keywords:** Kinetics, tissue culture, cell suspensions, growth rate, cell culture, proteinases, biotechnology.

Taouil de Schulz, Y. 1985. Study of some physicochemical chemical features in *Xanthosoma sagittifolium*. Revista de la Facultad de Agronomia, Universidad Central de Venezuela Alcance No. 33:281-343. **Keywords:** Quality, rhizomes, mechanical harvesting, plant composition, proteins, cultivars.

Vaillant, V. and F. Pilet. 1998. Relationship between tuberization and the appearance of a neutral invertase activity in *Pachyrhizus erosus* (L.) Urban. Tropical root crops: staples for sustainable food security into the next millennium 75(1-2):183-185. **Keywords:** Carbohydrates, monitoring, metabolism, sugars, enzyme activity, proteins.

Velasco, L. and W.J. Gruneberg. 1999. Analysis of dry matter and protein contents in fresh yam bean tubers by near-infrared reflectance spectroscopy. Communications in Soil Science and Plant Analysis 30(13-14):1797-1805. **Keywords:** Plant composition, proteins, dry matter, determination, spectroscopy.

Wielanek, M. and H. Urbanek. 1999. Glucotropaeolin and myrosinase production in hairy root cultures of *Tropaeolum majus*. Plant Cell, Tissue and Organ Culture 57(1):39-45. **Keywords:** Cell cultures, callus, cell suspensions, enzyme activity, genetic transformation, biotechnology.