

UNIVERSITAT DE LLEIDA

TESI DOCTORAL

**GENÈTICA DE LA VARIABILITAT ISOENZIMÀTICA EN
L'AVELLANER: IDENTIFICACIÓ VARIETAL**

Tesi Doctoral presentada per: Mercè Rovira i Cambra

Lleida, octubre, 1993

6.-REFERÈNCIES BIBLIOGRÀFIQUES

- ADAMS, W.T., 1983. Application of isozymes in tree breeding. A: Isozymes in plant genetics and breeding, Part A. S.D. Tanksley i T.J. Orton (eds.). Elsevier Science Publishers B.V., Amsterdam. p:381-400.
- AHMAD, Z., DALEY, L.S., MENENDEZ, M.A., LAGERSTEDT, H.B., 1987. Characterization of filbert (*Corylus*) species and cultivars using gradient polyacrylamide gel electrophoresis. J. Environ. Hort., 5(1):11-16.
- ALETÀ, N., OLARTE, C., TRUCO, M.J., ARÚS, P., 1989. Identification of walnut cultivars by isozyme analysis. Acta Hortic., 284:91-96.
- ALETÀ, N., ROVIRA, M., NINOT, A. , ARÚS, P., 1993. Inheritance of four isozymes in walnut. Acta Hortic., 311:62-67.
- ALLARD, R.W., 1956. Formulas and tables to facilitate the calculation of recombination values in heredity. Hilgardia, 24:235-278.
- ALLARD, R.W., 1960. Principles of Plant Breeding. John Wiley & Sons, New York.
- AL-JIBOURI, A.A.M., ADHAM, K.M., 1990. Biochemical classification of date palm male cultivars. J. Hortic. Sci., 65(6):725-729.
- ALVAREZ-REQUEJO, S., 1965. El avellano. Publicaciones del Ministerio de Agricultura (Madrid) (ed.). Serie A núm. 32, 190 pp.
- ANAGNOSTAKIS, S.L., 1991. Peroxidase allozyme phenotypes in *Castanea* and their segregation among progeny. HortScience, 26(11):1424.
- ARULSEKAR, S., PARFITT, D.E., McGRANAHAN, G.H., 1985. Isozyme gene markers in *Juglans* species. J. Hered., 76:103-106.
- ARULSEKAR, S., PARFITT, D.E., 1986. Isozyme analysis. Procedures for stone fruits, Almond, Grape, Walnut, Pistachio and Fig. HortScience, 21(4): 928-933.
- ARULSEKAR, S., PARFITT, D.E., KESTER, D.E., 1986a. Comparison of isozyme variability in peach and almond cultivars. J. Hered., 77:272-274.

- ARULSEKAR, S., McGRANAHAN, G.H., PARFITT, D.E., 1986b. Inheritance of phosphoglucosyltransferase and esterase isozymes in Persian walnut. *J. Hered.*, 77:220-221.
- ARÚS, P., 1983. Genetic purity of commercial seed lots. A: Isozymes in plant genetics and breeding, Part A. S.D. Tanksley i T.J. Orton (eds.). Elsevier Science Publishers B.V., Amsterdam. p:415-423.
- ARÚS, P., MORENO-GONZÁLEZ, J., 1993. Marker-assisted selection. A: Plant Breeding: Principles and prospects. M.D. Hayward, N.O. Bosemark i I. Romagosa (eds.). Chapman & Hall, London. p:314-331.
- ARÚS, P., OLARTE, C., VARGAS, F.J., ROMERO, M., 1993. Linkage analysis of ten isozyme genes in F_1 segregating progenies of almond. *J. Am. Soc. Hortic. Sci.*, (en premsa).
- ASHARI, S., ASPINALL, D., SEDGLEY, M., 1989. Identification and investigation of relationships of mandarin types using isozyme analysis. *Sci. Hortic.*, 40:305-315.
- AYFER, M., 1990. Nut production in Turkey. A: Nut production and industry in Europe, Near East and North Africa. Board (ed.), FAO REUR technical series, 13:317-325.
- AYFER, M., AZUN, A., BAS, F., 1986. Turkish hazelnut cultivars. KBFIB, Giresun. 95 pp.
- BARATTA, B., OCCORSO, G., 1979. Indagine carpologiche sul nocciolo. Osservazione su materiale introdotto e su cultivar del patrimonio corilicolo siciliano. Atti del Convegno nazionale su: Il miglioramento della coltura del mandorlo e del nocciolo. Aspetti genetici e tecnici. Messina e Siracusa (Itàlia) p:43-66.
- BERGOUGNOUX, F., GERMAIN, E., SARRAQUIGNE, J.P., 1978. Le noisetier. Production et culture. Invuflec, 136 pp.

- BHAT, K.V., BHAT, S.R., CHANEL, K.P.S., 1992a. Survey of isozyme polymorphism for clonal identification in *Musa*. I. Esterase, acid phosphatase and catalase. J. Hortic. Sci., 67(4):501-507.
- BHAT, K.V., BHAT, S.R., CHANEL, K.P.S., 1992b. Survey of isozyme polymorphism for clonal identification in *Musa*.II. Peroxidase, superoxide dismutase, shikimate dehydrogenase and malate dehydrogenase. J. Hortic. Sci., 67(6):737-743.
- BOTTA, R., EMANUEL, E., ME, G., SACERDOTE, S., VALLANIA,R., 1986. Indagine cariologica in alcune specie del genere *Corylus*. Riv.Ortoflorofrutt. It., 70:323-329.
- BRIEGER, F.G., MANGELSDORF, A.J., 1926. Linkage between a flower color factor and self-sterility factors. PNAS 12:248-255.
- BYRNE, D.H., 1989. Characterization of isozyme variability in apricots. J. Am. Soc. Hortic. Sci., 114(4):674.
- BYRNE, D.H., 1990. Isozyme variability in four diploid stone fruits compared with other woody perennial plants. J. Hered., 81(1):68-71.
- BYRNE, D.H., LITTLETON, T.G., 1988a. Verification of the parentage of presumed peach x almond hybrids by isozyme analysis. Fruit Var. J., 42(4):130-134.
- BYRNE, D.H., LITTLETON, T.G., 1988b. Electrophoretic characterization of diploid plums of the southeastern United States. J. Am. Soc. Hortic. Sci., 113(6):918-924.
- BYRNE, D.H., LITTLETON, T.G., 1989a. Interspecific hybrid verification of Plum x Apricot hybrids via isozyme analyses. HortScience, 24(1):132-134.
- BYRNE, D.H., LITTLETON, T.G., 1989b. Characterization of isozyme variability in Apricots. J. Am. Soc. Hortic. Sci., 114(4):674-678.

- CANALS, F., FOLCH, C., 1992. Resumen de los viveros de frutales en Catalunya. *Fruticultura profesional*, 52:9-24.
- CEREZO, M., SOCIAS I COMPANY, R., ARÚS, P., 1989. Identification of Almond cultivars by pollen isoenzymes. *J. Am. Soc. Hortic. Sci.*, 114(1):164-169.
- CHAPARRO, J.X.; DURHAM, R.E.; MOORE, G.A.; SHERMAN, W.B., 1987. Use of isozyme techniques to identify Peach x "Nonpareil" Almond Hybrids. *HortScience*, 22(2):300-302.
- CHAPARRO, J.X., GOLDY, R.G., MOWREY, B.D., WERNER, D.J., 1989. Identification of *Vitis vinifera* L. x *Muscadina rotundifolia* small hybrids by starch gel electrophoresis. *HortScience*, 24(1):128-130.
- CHENG, S., MEHLENBACHER, S.A., CHEN, T., 1990. Identification of hazelnut cultivars by isozyme analysis. A: XXIII Int. Hortc. Congres. Florència (Itàlia) Abstract núm.3011.
- CHEVREAU, E., 1984. Intérêt de l'électrophorèse pour l'identification des génotypes de pommier. 4e Colloque sur les recherches fruitières-Bordeus, 28-29 novembre, p:163-174.
- CLAVÉ, J., 1976. Principales características del fruto de las más importantes variedades de avellano de la provincia de Tarragona. Memoria I Congreso Internacional de Almendra y Avellana, Reus (Espanya) p:121-127.
- CRAWFORD, D.J., 1983. Phylogenetic and systematic inferences from electrophoretic studies. A: Isozymes in plant genetics and breeding, Part A. S.D. Tanksley i T.J. Orton (eds.). Elsevier Science Publishers B.V., Amsterdam. p:257-287.
- DALEY, S.L., MENENDEZ, R.A., STEBBINS, R.C., 1987. Identification of red-fruited pears by four derivated spectroscopy of intact lamina. *J. Environ. Hort.*, 5(1):25-28.

- DEGANI, C., BLUMENFELD, A., 1986. The use of isozyme analysis for differentiation between loquat cultivars. *HortScience*, 21(6):1457-1458.
- DEGANI, C., COHEN, M., EL-BATSRI, R., GAZIT, S., 1992. PGI Isozyme diversity and its genetic control in mango. *HortScience*, 27(3):252-254.
- DE WALD, M.G., MOORE, G.A., SHERMAN, W.B., 1992. Isozymes in *Ananas* (Pineapple): Genetics and usefulness in taxonomy. *J. Am. Soc. Hortic. Sci.*, 117(3):491-496.
- DURHAM, R.E., MOORE, G.A., SHERMAN, W.B., 1987. Isozyme banding patterns and their usefulness as genetic markers in peach. *J. Am. Soc. Hortic. Sci.*, 112(6):1013-1018.
- DURHAM, R.E., CIOU, P.C., GMITTER, F.G., MOORE, G.A., 1992. Linkage of restriction fragment length polymorphisms and isozymes in *Citrus*. *Theor. Appl. Genet.*, 84:39-48.
- DUKE, J.A., 1989. *Corylus*. A: Handbook of nuts. CRC. Press, Inc. Florida. p:116-130.
- EVREINOFF, V.A., 1958. Contribution à l'étude des noisetiers. *J. Agric. Trop. Bot. App.*, 5(4-5):247-295.
- EVREINOFF, V.A., 1963. Le passé géologique des noisetiers. *J. Agric. Trop. Bot. App.*, 10(8-9):393-395.
- EYNARD, I., 1969. Proposta d'una scheda per la descrizioni varietali del nocciuolo. *Annali Fac. Sci. Agr. Torino*, 5:31-56.
- FREGONI, M., MARCAZZAN, C., 1965. Ricerche sulle caratteristiche morfologiche, merceologiche e chimico-industriali dei frutti di alcune cultivar di nocciuolo dell'Italia Meridionale. *Industrie Agrarie*, III(10):457-467.
- GARCIA, M.D., CLAVÉ, J., 1985. Característiques i comportament de les varietats d'avellaner. Publicació CAMB (Centre Agropecuari Mas Bové), Generalitat de Catalunya-Diputació de Tarragona, núm.36, 79 pp.

- GERMAIN, E., 1986. Selection et création variétales. Convention INRA-ANPN. Rapport détaillé núm.1 (document mecanografiat).
- GERMAIN, E., 1983. Physiology of reproduction in Filbert (*Corylus avellana* L.): Flowering and fruiting. Convegno Internazionale sul Nocciuolo, Avellino (Itàlia) p:47-55.
- GERMAIN, E., 1990a. Hazelnut production and industry in Europe, north Africa and Middle east. A: Nut production and industry in Europe, Near East and North Africa. Board (ed.), FAO REUR technical series, 13:107-117.
- GERMAIN, E., 1990b. Hazelnut industry in France. A: Nut production and industry in Europe, Near East and North Africa. Board (ed.), FAO REUR technical series, 13:173-176.
- GERMAIN, E., 1991. Pauetet: nouvelle variété d'industrie. Fruits et Legumes, 83:18-19.
- GERMAIN, E., LEGLISE, P., DELORT, F., 1981 Analyse du systeme d'incompatibilité pollinique observé chez le noisetier *Corylus avellana* L. 1er. Colloque sur Recherches Fruitières. Bordeus, p:143-216.
- GIL, J.F., SANTOS, J., PLANA, J., 1986. El avellano en Tarragona. Situaciones y orientaciones sobre el cultivo. A: I Congreso Español de Frutos Secos, Reus (España). Ponencias y comunicaciones presentadas en la jornada técnica. Publicación CAMB (Centre Agropecuari Mas Bové), Generalitat de Catalunya-Diputació de Tarragona, núm. 37: 63-88.
- GIRONA, J., 1987. Caracterización de los síntomas provocados por el riego del avellano con aguas salinas: I caracterización y sensibilidad del cultivo. Commission des Communautés européennes. Rapport EUR 11207:61 (resum).
- GOLDRING, A., ZAMIR, D., DEGANI, CH., 1985. Duplicated phosphoglucose isomerase genes in avocado. Theor. Appl. Genet., 71:491-494.

- GOFFREDA, J.C., ARMSTRONG NICK, J.M., MEHLENBACHER, S.A., VORSA, N., 1991. Inheritance of isozymes in peach x *Prunus kansuensis* and peach x *Prunus daviana* hybrids. *Euphytica*, 54:161-168.
- GOTTLIEB, L.D., 1981. Electroforetic evidence and plant populations. *Prog. Phytochem.*, 7:1-47.
- GOTTLIEB, L.D., 1982. Conservation and duplication of isozymes in plants. *Science*, 216:373-380.
- HAMRICK, J.L., 1990. Isozymes and the analysis of genetic structure in plant populations. A: Isozymes in plant biology. D.E. Soltis i P.E. Soltis (eds.). Chapman and Hall. London, p:87-105.
- HAUAGGE, R., KESTER, D.E., ASAY, R.A., 1987a. Isozyme variation among almond cultivars: I. Inheritance. *J. Am. Soc. Hortic. Sci.*, 112(4):687-693.
- HAUAGGE, R., KESTER, D.E., ARULSEKAR, S., LIU, L., 1987b. Isozyme variation among California almond cultivars: II. Cultivar characterization and origins. *J. Am. Soc. Hortic. Sci.*, 112(4):693-698.
- HUNTER, R.L., MARKERT, C.L., 1957. Histochemical demonstration of enzymes separated by zone electrophoresis in starch gels. *Science*, 125:1294-1295.
- JACKSON, J.F., CLARKE, G.R., 1991. Gene Flow in an almond orchard. *Theor. Appl. Genet.*, 82:169-173.
- JANICK, J.; MOORE, J.N., 1975. *Advances in fruit breeding*. Janick i Moore (eds.). Purdue University Press. West Lafayette, Indiana. 623 pp.
- JANG, J.T., TANABA, K., TAMURA, F., BANNO, K., 1991. Identification of *Pyrus* species by peroxidase isozyme phenotypes of flowers buds. *J. Jpn. Soc. Hortic. Sci.*, 60(31):513-519.
- JARRET, R.L., LITZ, R.E., 1986. Isozymes as genetic markers in bananas and plantains. *Euphytica*, 35:539-549.

- JONA, R., 1986. Hazelnut. A: Handbook of fruit set and development. S.P. Monselise (ed.), CRC Press, INC. Boca Raton, Florida. p:193-216.
- KEPHART, S.R., 1990. Starch gel electrophoresis of plant isozymes: a comparative analysis of techniques. *Am. J. Bot.*, 77(5):693-712.
- KOVAL, G.K., 1976. Diversity of hazel in the Caucasus and the phylogenetic relationships of its species (en Rus). *Trudy po Prikladnoi Botanike Genetike i Slektzii*,57(1):110-114.
- KRUSSMAN. G., 1986. Manual of cultivated broad-leaved trees and shrubs. Timber Press, Beaverton, OR. Vol.I, A-D p:377-379.
- LAGERSTEDT, H.B., 1974. Development of a rootstock for filberts. 65th Annual Report of the Northern Nut Growers Association. Brock University, St. Chaterines, Ontario. p:161-165.
- LAGERSTEDT, H.B., 1975. Filberts. A: Advances in fruit breeding. Janick i Moore (eds.). West Lafayette, Indiana. p:456-589.
- LAGERSTEDT, H.B., 1980. "Ennis" and "Butler" filberts. *HortScience*, 15(6):833-835.
- LAGERSTEDT, H.B., 1990. Filbert rootstock and cultivar introduction in Oregon. USDA Research Horticulturist, Retired, Corvallis, OR 97331:60-63.
- LAGERSTEDT, H.B., HUBERT, G.E., 1976. Use of ionizing radiation to induce vegetative alterations in filbert, *Corylus avellana* L. 67th Annual Report of the Northern Nut Growers Association. Brownwood, Texas. p:12-17.
- LATORSE, M.P., 1981. Etude de deux facteurs limitant la productivité du noisetier *Corylus avellana* L.: Incompatibilité pollinique et fruits dépourvus d'amande. Mémoire D.E.A. Université de Bordeaux II, 52 pp.
- LEE, J.M., ELLSTRAND, N.C., 1987. Inheritance and linkage of isozymes in the chirimoya. *J. Hered.*, 78:383-387.

- LIMONGELLI, F., 1983. Selezione clonale della cultivar di nocciuolo "Tonda di Giffoni". Convegno Internazionale sul Nocciuolo, Avellino (Italia) p:253-258.
- LIMONGELLI, F., 1987. Selezione clonale della cultivar di nocciuolo "Tonda di Giffoni". Commission des communautés européennes. Rapport EUR 11207:41-42.
- LIMONGELLI, F., 1989. Per migliorare il nocciuolo. Agricoltura Campania, núm.1
- LO SCHIAVO, F., GIULIANO, G., TERZI, M., 1983. Identifying natural and parasexual hybrids. A: Isozymes in plant genetics and breeding, part A. S.D. Tanksley i T.J. Orton (eds.). Elsevier Science Publishers, Amsterdam, p:305-312
- LOUKAS, M., PONTIKIS, K., VERGINI, I., PAPALEXANDRIS, K., 1984. Identification of walnut and filbert cultivars by isozyme banding patterns. Agric. Res., 8:31-44.
- MALVOLTI, M.E., FINESCHI, S., 1987. Analysis of enzyme systems in chestnut (*Castanea sativa* Mill.). Estratto da "Genetica Agraria" Vol.XLI Fasc.3 p:243-256.
- MALVOLTI, M.E., PACIUCCI, M., CANNATA, M., FINESCHI, S., 1993. Genetic variation in italian populations of *Juglans regia* L. Acta Hortic., 311:86-94.
- MANGANARIS, A.G., 1989. Isozymes as genetic markers in apple breeding. PhD Thesis, University of London. 430 pp.
- MANGANARIS, A.G., ALSTON, F.H., 1987. Inheritance and linkage relationships of glutamate oxalacetate transaminase isoenzymes in apple. I. The gen *Got-1*, a marker for the S incompatibility locus. Theor. Appl. Genet., 74:154-161.
- MANGANARIS, A.G., ALSTON, F.H., 1988a. The acid phosphatase gene *ACP-1* and its linkage with the endopeptidase gene *END-1* and the pale green lethal gene *1* in apple. Acta Hortic., 224:177-184.



- MANGANARIS, A.G., ALSTON, F.H., 1988b. Inheritance and linkage relationships of glutamate oxalacetate transaminase isoenzymes in apple. 2. The genes *Got-2* and *Got-4*. *Theor. Appl. Genet.*, 76:449-454.
- MANGANARIS, A.G., ALSTON, F.H., 1989. Glutamate oxalacetate transaminase isoenzyme in apple cultivars and rootstocks. *J. Hortic. Sci.*, 64(1):9-15.
- MANGANARIS, A.G., ALSTON, F.H., 1992a. Genetics of leucine aminopeptidase in apple. *Theor. Appl. Genet.*, 83:345-352.
- MANGANARIS, A.G., ALSTON, F.H., 1992b. Inheritance and linkage relationships of peroxidase isoenzymes in apple. *Theor. Appl. Genet.*, 83:392-399.
- MANGANARIS, A.G., ALSTON, F.H., 1992c. Genetics of esterase isoenzymes in *Malus*. *Theor. Appl. Genet.*, 83:462-475.
- MANZO, P.; TAMPONI, G., 1982. Monografia di cultivar di nocciuolo. Istituto Sperimentale per la Frutticoltura. Roma, 62 pp.
- M.A.P.A., 1977. Inventario Agronómico del Avellano en Tarragona. Ministerio de Agricultura Pesca y Alimentación, Dirección general de la producción agraria.
- M.A.P.A., 1987. Inventario Agronómico del Avellano en Tarragona. Ministerio de Agricultura Pesca y Alimentación, Dirección general de la producción agraria.
- MARKERT, C.L., MOLLER, F., 1959. Multiple forms of enzymes: tissue, ontogenic, and species specific patterns. *Proc. Nat. Acad. Sci., USA* 45:753-763.
- MARQUARD, R.D., 1987. Isozyme inheritance, polymorphism, and stability of malate dehydrogenase and phosphoglucose isomerase in Pecan. *J. Am. Soc. Hortic. Sci.*, 112(4):717-721.

- MARQUARD, R.D., 1989. Rare allozymes of malate dehydrogenase in Pecan. Hortscience, 24(1):156.
- MARQUARD, R.D., 1991. Inheritance of phosphoglucomutase isozymes in Pecan. HortScience, 26(9):1213-1214.
- MARQUARD, R.D., SKORPENSKE, R.G., 1989. Expression of heritable biochemical markers from various pecan tissues. Euphytica, 42:65-70.
- McGRANAHAN, G.H., TULECKE, W., ARULSEKAR, S., HANSEN, J.J., 1986. Intergenic hybridization in the Juglandaceae: *Pterocarya* sp. x *Juglans regia*. J. Am. Soc. Hortic. Sci., 111(4):627-630.
- ME, G., ROMISONDO, P., RADICATI, L., 1979. Caratteri carpomerceologici di nuovi incroci di nocciuolo. Atti del Convegno nazionale su: Il miglioramento della coltura del mandorlo e del nocciuolo. Aspetti genetici e tecnici. Messina e Siracusa (Italia) p:129-136.
- MEHLENBACHER, S.A., 1991. Hazelnuts (*Corylus*). A: Genetic resources of temperate fruit and nut crops 2. ISHS, Wageningen, The Netherlands p:791-836.
- MEHLENBACHER, S.A. , SMITH, D.C., 1988. Heritability of ease of hazelnut pellicle removal. HortScience, 23(6):1053-1054.
- MEHLENBACHER, S.A., MILLER, A., 1989. Hazelnut breeding and evaluation. Progress Report to the Oregon Hazelnut commission. April, 1989 (document mecanografiat).
- MEHLENBACHER, S.A., THOMPSON, M.M., 1991. Inheritance of a chlorophyll deficiency in hazelnut. HortScience, 26(11):1414-1416.
- MEHLENBACHER, S.A., MILLAR, A.N., THOMPSON, M.M., LAGERSTEDT, H.B., SMITH, D.C., 1991. "Villamete" Hazelnut. HortScience, 26(10):1341-1342.

- MENA, J., 1987. Selección y Mejora genética del avellano en Tarragona. Commission des Communautés européennes. Rapport EUR 11207:47-48.
- MENENDEZ, R.A., DALEY, L.S., 1986. Characterization of *Pyrus* species and cultivars using gradient Polyacrilamide gel electrophoresis. J. Environ. Hort., 4(2):56-60.
- MESSEGUER, R., ARÚS, P., CARRERA, M., 1987. Identification of peach cultivars with pollen isozymes. Sci. Hortic., 31:107-117.
- MESSINA, R., TESTOLIN, R., MORGANTE., 1991. Isozymes for cultivar identification in Kiwifruit. HortScience, 26(7):899-902.
- MIELKE, E.A., WOLFE, W.H., 1982. Identification of Pecan cultivars with pollen isozymes. HortScience, 17(3): 382-383.
- MILLAR, C.I., 1985. Inheritance of allozyme variants in bioshop pine (*Pinus muricata*. D.Don). Biochem. Genet., vol.23 nº 11/12.
- MITTON, J.B., 1983. Conifers. A: Isozymes in plant genetics and breeding, Part B. S.D. Tanksley i T.J. Orton (eds.). Elsevier Science Publishers B.V., Amsterdam. p:443-472.
- MONASTRA, F., TAMPONI, G., AVANZATO, D., 1990. Nut industry in Italy. A: Nut production and industry in Europe, near East and north Africa. Board (ed.), FAO REUR technical series, 13:195-213.
- MONET, R., GIBault, B., 1991. Polymorphisme de l' α -amilase chez le pecher. Etude génétique. Agronomie, 11:353-358.
- MOORE, G.A., COLLINS, G.A., 1983. New challenges confronting plant breeders. A: Isozymes in plant genetics and breeding, Part A. S.D. Tanksley i T.J. Orton (eds.). Elsevier Science Publishers B.V., Amsterdam. p:25-58.

- MOWREY, B.D., WERNER, D.J., BYRNE, D.H., 1990. Inheritance of isocitrate dehydrogenase, malate dehydrogenase, and shikimate dehydrogenase in peach and peach x almond hybrids. *J. Am. Soc. Hortic. Sci.*, 115(2):312-319.
- NEWTON, J.J., 1983. Genetics of mitochondrial isozymes. A: Isozymes in plant genetics and breeding. Part A. S.D. Tanksley and T.J. Orton (eds). Elsevier Science Publishers B.V., Amsterdam. p:157-174.
- OCKENDON, D.J., 1977. Rare self-incompatibility alleles in a purple cultivar of Brussels sprouts. *Heredity*, 39:149-152.
- OCKENDON, D.J., 1980. Distribution of S-alleles and breeding structure of Cape broccoli (*Brassica oleracea* var. "italica"). *Theor. Appl. Genet.*, 58:11-15.
- OUAZZANI, N., LUMARET, R., VILLEMUR, P., DI GIUSTO, F., 1993. Leaf allozyme variation in cultivated and wild olive trees (*Olea europaea* L.). *J. Hered.*, 84:34-42.
- PAGLIETTA, R., 1976. Nuevas selecciones de avellano para Piemonte (Italia). Memoria I Congreso internacional de Almendra y Avellana, Reus (Espanya) p:211-215.
- PARFITT, D.A., ARULSEKAR, S., RAMMING, D.W., 1985. Identification of plum x peach hybrids by isoenzyme analysis. *HortScience*, 20(2):246-248.
- PARFITT, D.A., ARULSEKAR, S., 1989. Inheritance and isozyme diversity for GPI and PGM among grape cultivars. *J. Am. Soc. Hortic. Sci.*, 114(3):486-491.
- PARFITT, D. E., YONEMORI, J., RYUGO, K., SUGIURA, A., 1991. Isozyme identification of Japanese Persimmon (*Diospyros kaki* L.): comparison of cultivars in California and Japan. *Fruit Var. J.*, 45(2):107-113.

- PONCHIA, G., FERROLI, S., 1988. Osservazioni su caratteristiche fenologiche e produttive di alcuni semenzale di nocciuolo. *Frutticoltura*, (4):75-80.
- PONTIKIS, C.A., LOUKAS, M., KOUSOUNIS, G., 1980. The use of biochemical markers to distinguish olive cultivars. *J. Hortic. Sci.*, 55(4):333-334.
- QUARTA, R., ARNONE, S., 1987. Peroxidase polymorphism in apple cultivars. *Adv. Hort. Sci.*, 1:83-86.
- RECUPERO, G.R., RUSSO, G., ZAMPINO, D., 1989. Gli isozimi per la caratterizzazione dei portinnesti degli agrumi. *Frutticoltura*, Núm.8/9 p:39-43.
- RICHARTE, N., 1989. Contribution a l'identification variétale du pistachier (*Pistacea vera* L.) par électrophorèse des isozymes. IRTA-Ecole Nationale supérieure Agronomique de Rennes. Treball fi de carrera (document mecanografiat).
- RIERA, F., 1962. La coltivazione del nocciuolo in Spagna. *Atti del Convegno Internazionale sul Nocciuolo*, Alba (Itàlia) p:71-99.
- ROMISONDO, P., 1967. Il miglioramento genetico del nocciuolo. *Ital. Agric.*, 104:1297-1312.
- ROMISONDO, P., 1978. La fertilità del nocciuolo. *Riv. Ortoflorofrutt. Ital.*, 62(4):423-434.
- ROMISONDO, P., ME, G., LIMONGELLI, F., RADICATI, L., 1976. Amélioration génétique du noisetier: recherches et résultats. *Memoria I congreso internacional de Almendra y Avellana*, Reus (Espanya) p:97-107.
- ROMISONDO, P., ME, G., RADICATI, L., 1979. Selezione clonale della "Tonda Gentile delle Langue": Risultati di 4 anni di indagini. *Atti del Convegno nazionale su: Il miglioramento della coltura del mandorlo e del nocciuolo. Aspetti genetici e tecnici*. Messina e Siracusa (Itàlia) p:103-128.

- ROMISONDO, P., ME, G., RADICATI, L., 1983a. Risultati nel campo del miglioramento genetico del nocciolo attraverso l'incrocio e la mutagenesi. Convegno Internazionale sul Nocciuolo, Avellino (Italia) p:231-241.
- ROMISONDO, P., ME., G., RADICATI, L., 1983b. Ulteriori indagini sulla selezione clonale del nocciolo: cultivar "Tonda Gentile delle Langue". Convegno Internazionale sul Nocciuolo, Avellino (Italia) p:243-251.
- ROMISONDO, P., ME., G., RADICATI, L., 1987. Caracteristiques bio-agronomiques et commerciales de nouveaux hybrides de noisetier. Commission des Communautés européennes. Rapport EUR 11207:49 (resum).
- ROVERSI, A., 1976. Estudios sobre las relaciones entre composición del suelo, diagnóstico foliar y caracteres físico-químicas y comerciales de las avellanas. Memoria I Congreso Internacional de Almendra y Avellana, Reus (Espanya) p:235-247.
- ROVIRA, M., 1983. Millora genètica de l'avellaner i l'ametller: estat de coneixements en curs al CAMB. Publicació CAMB, Generalitat de Catalunya-Diputació de Tarragona, núm. 29, 55 pp.
- ROVIRA, M., 1989. Fórmulas alélicas de incompatibilidad polínica en el avellano (*Corylus avellana* L.). Invest. Agrar. Prod. Prot. Veg., 4(1):59-70.
- ROVIRA, M., ALETÀ, N., GERMAIN, E., ARÚS, P. 1993. Inheritance and linkage relationships of ten isozyme genes in hazelnut. Theor. Appl. Genet., 86:322-328.
- ROYO, B., GONZALEZ, J., LAQUIDAIN, M.J., LARUMBE, M.P., 1989. Caracterización mediante análisis isoenzimático de clones de la vinífera "Garnacha" (*Vitis vinifera* L.). Invest. Agrar. Prod. Prot. Veg., 4(3):343-354.

- SALESSES, G., 1973. Etude cytologique du genre *Corylus*. Mise en évidence d'une translocation hétérozigote chez quelques variétés de noisetier cultivé (*C. avellana*), a fertilité pollinique réduite. Ann. Amélior. Plant., 23(1):59-66.
- SAMPSON, D.R., 1967. New light on the complexities of anthocyanin inheritance in *Brassica oleracea*. Can. J. Genet. Cytol., 9:352-358.
- SANTI, F., LEMOINE., 1990. Genetic markers from *Prunus avium* L: inheritance and linkage of isozyme loci. Ann. Sci. For., 47:131-139.
- SCHUSTER, C.E., 1924. Filberts. Oregon Agric. Esp. Sta. Bull 208, 39
- SCHWENNESEN, J., MIELKE, F.A., WOLFE, W.H., 1982. Identification of seedless table grape cultivars and a bud sport with berry isozymes. HortScience, 17(3):366-368.
- SHIELDS, C.R., ORTON. T.J., STUBER, C.W., 1983. An outline of general resource needs and procedures for the electrophoretic separation of active enzymes from plant tissue. A: Isozymes in plant genetics and breeding, Part A. S.D. Tanksley i T.J. Orton (eds.). Elsevier Science Publishers B.V., Amsterdam. p:443-468.
- SMITHIES, O., 1955. Zone electrophoresis in starch gels. Biochem. J., 61:629.
- SOLAR, A., SOMLE, J., STAMPAR, F., 1993. Identification of walnut cultivars by pollen isozymes. Acta Hortic., 311:95-100.
- SOLIVA, M., SERENA, C., GARCIA, M.D., RIERA, M., 1983. Determinació i descripció de l'oli del gra de diferents varietats d'avellana. Publicació CAMB (Centre Agropecuari Mas Bové), Generalitat de Catalunya-Diputació de Tarragona, núm. 24, 10 pp.
- SOOST, R.K., TORRES, A.M., 1981. Leaf isozymes as genetic markers in *Citrus*. Proc. Inc. Soc. Citriculture., 1:7-10.

- SUITER, K.A., WEDEL, J.F., CASE, J.S., 1983. LINKAGE-1: a Pascal computer program for the detection and analysis of genetic linkage. *J. Hered.*, 74:203-204.
- TANKSLEY, S.D., 1983a. Gene mapping. A: Isozymes in plant genetics and breeding, Part A. S.D. Tanksley i T.J. Orton (eds.). Elsevier Science Publishers B.V., Amsterdam. p:109-138.
- TANKSLEY, S.D., 1983b. Molecular markers in plant breeding. *Plant. Mol. Biol.*, vol 1:1, p:3-8.
- TANKSLEY, S.D., RICK, C.M., VALLEJOS, C.E., 1984. Tight linkage between a nuclear male-sterile locus and an enzyme marker in tomato. *Theor. Appl. Genet.*, 68:109-113.
- TANKSLEY, S.D., YOUNG, N.D., PATERSON, A.H., BONIERBALE, M.W., 1989. RFLP mapping in plant breeding: new tools for an old science. *Bio/technology*, 7:257-264.
- TARHAN, S., 1993. Turkish policy on hazelnuts. *The Cracker*, 2:45-46.
- TASIAS, J., 1975. El Avellano en la provincia de Tarragona. *Diputació de Tarragona (ed.)*, 363 pp.
- THOMPSON, M.M., 1974. Progress towards new filbert varieties. *Proc. Nut Growers Soc. of Oregon and Washington*, 97-53.
- THOMPSON, M.M., 1976. Mejora genética del avellano. *Memoria I Congreso internacional de Almendra i Avellana, Reus (Espanya)* p:255-257.
- THOMPSON, M.M., 1977a. Inheritance of nut traits in filbert (*Corylus avellana* L.). *Euphytica*, 26:465-474.
- THOMPSON, M.M., 1977b. Inheritance of big bud mite susceptibility in filbers. *J. Am. Soc. Hortic. Sci.*, 102(1):39-42.
- THOMPSON, M.M., 1979. Genetics of incompatibility in *Corylus avellana* L. *Theor. Appl. Genet.*, 54:113-116.

- THOMPSON, M.M., 1985. Linkage of the incompatibility locus and red pigmentation genes in hazelnut. *J. Hered.*, 76:119-122.
- THOMPSON, M.M., ROMISONDO, P., GERMAIN, E., VIDAL-BARRAQUER, R., TASIAS VALLS, J. 1978. An evaluation system for Filberts (*Corylus avellana* L.). *HortScience*, 13(5):514-517.
- TODOROVIC, R., 1989. Investigation of filbert (*Corylus* L.) isozymes. *Adv. Hort. Sci.*, 3:38-39.
- TOMBESI, A., PREZIOSI, P., 1987. Primi risultati sul miglioramento genetico del nocciolo. Commission des communautés européennes. Rapport EUR 11207:43-46.
- TORRES, A.M., 1983. Fruit trees. A: Isozymes in plant genetics and breeding, Part B. S.D. Tanksley i T.J. Orton (eds.). Elsevier Science Publishers B.V., Amsterdam. p:401-422.
- TORRES, A.M., 1990. Isozyme analysis of tree fruits. A: Isozymes in plant biology. D.E. Soltis i P.S. Soltis (eds.). Chapman and Hall. London, p:192-205.
- TORRES, A.M., SOOST, R.K., DIEDENHOFEN, U., 1978. Leaf isozymes as genetic markers in *Citrus*. *Am. J. Bot.*, 65(8):869-881.
- TORRES, A.M., TISSERAT, 1980. Leaf isozymes as genetic markers in date palms. *Am. J. Bot.*, 67(2):162-167.
- TORRES A.M., BERGH, B.O., 1980. Fruit and leaf isozymes as genetic markers in Avocado. *J. Am. Soc. Hortic. Sci.*, 105(4):614-619.
- TORRES, A.M., MAU-LASTOVICKA, T., WILLIAMS, T.E., SOOST, R.K., 1985. Segregation distorsion and linkage of *Citrus* and *Poncirus* isozyme genes. *J. Hered.*, 76:289-294.
- TORRES, A.M., MAU-LASTOVICKA, T., VITHANGE, V., SEDGLEY; M., 1986. Segregation distorsion and linkage analysis of hand pollinated avocados. *J. Hered.*, 77:445-450.

- TOUS, J., 1991. Nuevas plantaciones de avellano. *Agricultura*, 709:732-735.
- TOUS, J., ROVIRA, M., PLANA, J., 1987. Cultivo del avellano. *Fruticultura Profesional*, 11:115-123.
- TOUS, J., GIRONA, J., TASIAS, J., 1992a. Cultural practices and costs in hazelnut production. III International Congress on Hazelnut, Alba (Itàlia). *Acta Hortic.*, (en premsa).
- TOUS, J., OLARTE, C., TRUCO, M.J., ARÚS, P., 1992b. Isozyme polymorphisms in carob cultivars. *HortScience*, 27(3):257-258.
- TSIPOURIDIS, C., 1990. Nut production, research and development activities in Greece. A: Nut production and industry in Europe, Near East and North Africa. Board (ed.), FAO REUR technical series, 13:183-188.
- TROTTER, A., 1951. *Il nocciolo (Corylus)*. Soc. Ed. Dante Alighieri, Roma, Napoli, città di Castello.
- TROTTER, A., MATONS, A., 1922. Descripció de les més importants varietats d'avellaner cultivades a Catalunya. *Arxius de l'Escola Sup. d'Agric.*, Barcelona. 71 pp.
- TRUCO, M.J., ROVIRA, M., ARÚS, P., PÉREZ, A.M., 1989. Application de l'électrophorèse isoenzymatique pour l'identification varietale chez le noisetier (*Corylus* sp). Commission des communautés européennes. *Rapport EUR 12005:119-130*.
- TRUJILLO, I., RALLO, L., CARBONELL, E.A., ASINS, M.J., 1990. Isoenzymatic variability of olive cultivars according to their origin. *Acta Hortic.*, 286: 137-139.
- UPOV (International Union for the Production of New Varieties of Plants), 1979. Guidelines for the conduct of tests for distinctness, homogeneity and stability. Hazelnut (*Corylus avellana* L. & *Corylus maxima* Mill.) TG/71/3, 19 pp.

- USDA, Agricultural statistics board, 1993. Noncitrus fruits & nuts preliminary, january.
- VALIZADEH, M., 1977. Esterase and acid phosphatase polimorphism in the fig tree (*Ficus carica* L.). *Biochem. Genet.*, Vol.15, núm.11/12:1037-1048.
- VALLEJOS, C.E., 1983. Enzyme activity staining. A: Isozymes in plant genetics and breeding, Part A. S.D. Tanksley i T.J. Orton (eds.). Elsevier Science Publishers B.V., Amsterdam. p:469-516.
- VARGAS, F.J., 1989. Situación actual y prespectivas de la obtención de material vegetal en nogal, avellano y pistachero. *Frut*, IV(6):312-321.
- VARGAS, F.J., 1990. Nuts in Spain: almond, hazelnut, walnut and pistachio. A: Nut production and industry in Europe, near East and north Africa. Board (ed.), FAO REUR technical series, 13:255-280.
- VIDAL-BARRAQUER, R., TASIAS, J., 1976. Elección varietal y técnica del cultivo del avellano. Memoria I Congreso Internacional de Almendra y Avellana, Reus (Espanya) p:51-93.
- WEEDEN, N.F., 1983. Plastid isozymes. A: Isozymes in plant genetics and breeding, Part A. S.D. Tanksley i T.J. Orton (eds.). Elsevier Science Publishers B.V., Amsterdam. p: 139-156.
- WEEDEN, N.F., GOTTLIEB, L.D., 1980. Isolation of citoplasmatic enzymes from pollen. *Plant Physiol.*, 66:400-403.
- WEEDEN, N.F., LAMB, R.C., 1985 Identification of apple cultivars by isozyme phenotypes. *J. Am. Soc. Hortic. Sci.*, 110(4):509-515.
- WEEDEN, N.F., LAMB, R.C., 1987. Genetics and linkage analysis of 19 isozyme loci in apple. *J. Am. Soc. Hortic. Sci.*, 112(5):865-872.
- WEEDEN, N.F., WENDEL, J.F., 1990. Genetics of plant isozymes. A: Isozymes in plant biology. D.E. Soltis i P.S. Soltis (eds.). Chapman and Hall. London. p:46-72.

- WEIJIAN, L., WANYING, X., 1992. The study on hazelnut breeding in northern China. III International Congress on Hazelnut, Alba (Itàlia). Acta Hortic., (en premsa).
- WENDEL, J.F., WEEDEN, N.F., 1990. Visualisation and interpretation of plant isozymes. A: Isozymes in plant biology. D.E. Soltis i P.S. Soltis (eds.). Chapman and Hall. London. p:5-45.
- WERNER, D.J., 1992. Catalase polymorphism and inheritance in Peach. HortScience, 27(1):41-43.
- WERNER, D.J., MOXLEY, D.F., 1991. Relationship between malate dehydrogenase isozyme genotype and plant vigor in peach. J. Am. Soc. Hortic. Sci., 116(2):327-329.
- WOODROOF, J.G., 1967. Filberts. A: Tree nuts: production, processing, products. The AVI publishing company, INC. Westport, Connecticut. p:277-312.
- ZAMIR, D., TANKSLEY, S.D., JONES, R.A., 1981. Genetic analysis of the origin of plants regenerated from anther tissues of *Lycopersicon esculentum*. Plant Sci., 21:223-227.
- ZAMIR, D., TADMOR, Y., 1986. Unequal segregation of nuclear genes in plants. Bot. Gaz., 147:355-358.



