

Religious and Cultural Significance of the Citron (*Citrus medica* L. ‘Diamante’) from Calabria (South Italy): A Biblical Fruit of the Mediterranean Land

Gina Maruca¹, Gaetano Laghetti¹ and Karl Hammer²

1. Institute of Bioresources and Bioscience, National Council of Research, Bari 70126, Italy

2. Former Institute of Crop Science, University of Kassel, Witzenhausen D-37213, Germany

Abstract: The history and geographical origin of citron (*Citrus medica* L.) is still unknown but most of authors agree that it originated in Southeast Asia. There are different opinions about the exact period and the steps by which it was brought from its country of origin to the Mediterranean basin where it is cultivated in Corsica, Crete and in southern Italy (Calabria region). In particular, *Citrus medica* ‘Diamante’ grows, almost exclusively, in a restricted area of the Tyrrhenian coast of the region Calabria, called “Riviera dei Cedri”, a relevant local economic district. This citron has been and is, still being used by Jews for worship during the Feast of Tabernacles, a very important religious ritual, where it plays a prominent part; in fact, for this holiday of Sukkot, the use of the authentic citron that grows in Calabria region is recommended, because it is not grafted. In this paper, the fascinating history of *C. medica* and its spread from the centers of origin to the Mediterranean is reported with the aim to investigate the religious and cultural significance of the *C. medica* ‘Diamante’, an exclusive and historical heritage of the Calabria region.

Key words: Citron (*Citrus medica* L.), sukkot, Hebrew.

1. Introduction

The citron (*Citrus medica* L.) is a species of the genus *Citrus* (Rutaceae). It is one of the three “basic” true species of this genus, with mandarin (*C. reticulata* Blanco) and pummelo (*C. maxima* (Burm.) Merr.) [1, 2], from which all the other are thought to be derived by interspecific hybridization [3, 4].

C. medica was the first citrus fruit brought under cultivation and the first species of *Citrus* to spread west [5]. In fact, according to most authors, the next-to-arrive citrus fruits, lemon and some oranges, reached the Mediterranean only much later [6]. The name of this plant itself is considered to provide evidence of its ancient origin. Knowledge on early history of citron crop is poor. This species was known in Egypt, at Pharaohs times, as a model proves which was taken from a tomb (1200 B.C.) and stored at the

Louvre Museum [7]. Evidence of citron seeds were found in the excavation of Sumerian ruins of old Nippur, in southern Babylonia (present-day Iraq), which date back to about 4000 B.C. [8]. These seeds were probably brought either as an offering to a divinity or as a gift to a king. The citron was considered a valuable commodity due to its healing qualities, symbolic use and pleasant smell on the one hand and its rarity on the other [9].

C. medica originated in eastern India and south China [5]; in fact, the earliest references are to be found in the *Vajasaneiy Samhita*, a compilation of Vedic religion texts, called *Yajur-Veda* (ca. 1200-1000 B.C.) in which the term *jambila* appears indicating the citron. The Latin name *medica*, present in its binomial naming, refers to the ancient Media, a region that later became incorporated into the kingdom of Persia. Theophrastus, the great Greek botanist, in his *Historia Plantarum*, writes that there is

Corresponding author: Gina Maruca, researcher, main research field: ethnobotany. E-mail: gina.maruca@ibbr.cnr.it.

a plant in Persia which produces a fruit called the "Fruit of Persia" or "Fruit of Media" or *Persian citron* or *Median Apple* (Book IV, Chapter IV). He gave an excellent morphological description of citron tree, describing how to produce and utilize its fruit that is not edible; moreover, he writes that the highly perfumed fruits and leaves are used to protect laundry from moths [9]. Also, the first of Latin writers, Virgil (70-19 B.C.) in his *Georgics* (Book II-146), describes the citron using the name *Median apple* whose juice with a persistently wretched taste, is an excellent remedy against poisons. Pliny the elder (25-79 A.D.), in his *Historia Naturalis*, names the citron *Malus assyria* and also, changed the Greek name *Kedros* into the Latin *Citrus*. Moreover, he says that the citron was used as antidote to poisons [10].

The diffusion of citron from its centre of origin in South-east Asia to the Mediterranean and other areas is still debated. Most taxonomists agree that the Jews knew the citron from Egypt, during a very long period of captivity (four-hundred years). They brought it to Palestine, and from there they carried it to all Mediterranean regions along with them in their diaspora, since the second century B.C. [11-12]. This Jewish migration took place towards Syrian areas of Minor Asia and Greece in the third and second century B.C.. After the second destruction of the Salomon's temple, in Jerusalem (70 A.D.) [13], a stream of Jewish people arrived to South Italy [14-16]. Some of them, landed in Rome [17] where they founded an important community near Ancient Ostia, in the ruins of which the citron is often represented [18, 19]. The Jewish population increased in Italy, over the time [20, 21] establishing communities in many other towns [22]. *C. medica* played a prominent role in Jewish religious rituals and appeared on Jewish coins, during 66-70 A.D. and other artistic representations [23]. The presence of citron in Italy is closely connected to the Jewish people that cultivated it for the Sukkot, or festivity of the Tabernacles, remembering the shelters used in the desert by the

Jews escaping from Egypt, during the Exodus [24]. This important and sacred feast is celebrated after the vintage—time and olive harvest of which Lucius Mestrius Plutarchus (46-120 A.D.) writes in his *Quaestiones Convivales* [4, 6, 25].

During the Sukkot, celebrated on the 15th day of the month of Tishrei and varying in time from late September to late October, due to the fact that the Jewish religion relies on a lunar calendar, the Jews have to walk around the perimeter of their synagogues, holding in their right hand a small bundle made up by an date-palm branch, two willow branches and three myrtle branches, while gripping in the left hand a citron fruit [18]. According to the Jewish tradition, the four species used in this feast, mean the most important sins from which to escape, the palm is the pride, the willow is the slander, the myrtle is the inquisitiveness and the citron is the lust [26]. For this important feast, the Jews used *C. medica* 'Diamante' that is, almost exclusively, cultivated on a short stretch of Tyrrhenian coast, called "Riviera dei Cedri", in Cosenza province (Fig. 1).

It is of unknown origin, but it is the leading cultivar in Italy and preferred elsewhere, because it furnishes the best candied peel, for food industry [24, 27]. *C. medica* 'Diamante' is suitable for Jewish ritual use, for reasons both of tradition and morphology (shape, size, ecc.). It is the authentic citron (Fig. 2) required for the Festivity, with fruit stalk present, light yellow fruit colour with a green tone and no black spots or blemishes, and should be, at least, twice the size of an egg, oblong shape, broad at the bottom and narrow at the top; moreover, it is very important that the fruits must be grown on trees which neither have been grafted nor any of their ancestors or preancestors [6].

2. Material and Methods

Scarcity of information accounts for poor knowledge about the history of the *C. medica* 'Diamante' and its presence in Italy. So, classical and recent literature for understanding the symbolic-religious role of the citron



Fig. 1 Map of Calabria with the “Riviera dei Cedri”.



Fig. 2 Citron used by Jews on the holiday of Sukkot.

in Judaism and its presence in southern Italy, has been consulted [18, 24, 25, 28, 29]. Additionally, several missions with local experts with a detailed knowledge of the citron, were organized; many interviews that contained specific questions on plant morphology, habitat and main uses of *C. medica* 'Diamante' were carried out in the "Riviera dei Cedri". This is a narrow stretch of Tyrrhenian coast of Calabria region (40 km), in the Cosenza province, which since ancient times, because of soil fertility and beauty of the places, was settled by prehistoric people, Greeks, Romans, Byzantines and Normans [28]. This nice and harmonious territory, covered with history and traditions, preserves an enormous naturalistic richness. In particular, on the north of the "Riviera dei Cedri", in the Pollino territory, there is special area, called "Mercurion area" (from the Mercure river that crosses the homonymous valley), very rich in vegetation and gorges, where the oriental monks, as survivors of iconoclastic wars, built their monasteries [29]. Today, this very beautiful coast is a well known international

holiday resort. The exclusive centre for the citron production, is Santa Maria del Cedro where 79 hectares are cultivated to give a production of 1,160 metric tons [30]; it is a small town located on the archaeological site of Magna Grecia colony Laos, on Lao river, a very ancient isthmian road between the Tyrrhenian and Ionian seas, which played an important role for the regional economy.

3. Results

The sandy soil and geographical exposition of the "Riviera dei Cedri" favour the optimum development and production of citron (Fig. 3); in fact, because of its low resistance to frost and heat, the cultivation is restricted to this stretch of coast where the winters are mild and summer temperatures are not excessively high.

Two different areas were identified; the one placed along the coast that includes the majority of the farms of large dimensions, representing 80% of the all invested surface, the other one located in the hill



Fig. 3 Citron growing on the "Riviera dei Cedri", a restricted area of the Tyrrhenian coast of Calabria region.

country, at 300 m asl, with few little farms. Commercial farmers need large investments of time and labor to perform the horticultural practices necessary to produce salable fruit. This includes careful protection of the fruit against blemishes caused by wind, sunburn, thorns, and insects. The beauty of the fruit is important to observant Jews, and unblemished, shapely fruits, always a small minority of the crop, can sell for 100 dollars or more each. Blemished specimens, and fruits from grafted trees, are sometimes sold for culinary use. The rind is used to make preserves, and as a flavouring ingredient for savory dishes and alcoholic beverages. The candied peel is widely employed in the food industry and it is an essential constituent in certain cakes (plum pudding, buns, sweet rolls) and confections. A special typical Calabrian dessert is "*pannicello*" that is made with raisins and citron candied fruit gathered into baked leaves; it is mentioned by the famous Italian poet Gabriele D'Annunzio in his narrative opera "Leda senza cigno" (Leda without swan), for its wonderful taste [28]. The gastronomic use of citron is very ancient; already, the Roman gastronomist Marco Gavio Apicio (25 B.C.), in his *De re coquararia*, describes some recipes with a basis of citron [29].

Recent studies have been reported that the consumption of certain foods with a basis of citron, have a positive effect on health due to the antioxidant, anti-inflammatory and hypoglycaemic potential of this fruit, at maturity stages [31]. Moreover, the anticholinesterase effect of 'Diamante' peel extract is important to treatment of diabetes and Alzheimer's disease [32]. Also, the essential oils characterized by a high content of limonene, a very effective terpene against cellular proliferation in the colon and pancreas cancer, are utilized in pharmaceuticals and cosmetics [33].

4. Discussion

The citron is one of the most commercially important fruits together with mandarin (*C. reticulata* Blanco), sweet orange (*C. sinensis* (L.) Osbeck), sour

orange (*Citrus aurantium* L.), grapefruit (*C. paradisi* Macf.), lemon (*C. limon* (L.) Osb.) and lime (*C. aurantiifolia* (Christm.) Swingle), in the Mediterranean citrus industry [3]. It has been successfully grown and processed in other countries but its culture has not persisted because of the inability to withstand competition from the Mediterranean. It was, and still is, an important cash crop for agricultural regional economy; the *C. medica* 'Diamante' cultivation for religious uses represents a further pillar of the importance of citrus culture. From commercial and industrial point of view, its production is totally used for industrial transformation. Moreover, its medical qualities suggest a potential use for food or nutraceutical product due to the high content of interesting phytochemicals. From a historical perspective, the results of the present study, evidence the special role played by Jews in the spread of the citron as the authentic sacred fruit used in their Tabernacles ritual. Presumably, in the course of their wandering, Jewish people brought citron fruit or seed with them and, wherever possible, established the culture of this unique citrus species.

5. Conclusions

Scanty information has been responsible for poor knowledge about early history of this prestigious fruit that is involved in the origin of important citrus hybrids known to us today, such as the bergamot (*C. bergamia* Risso et Poiteau). *C. medica* is one of the donor genotypes of modern cultivated varieties, with *C. maxima* and *C. reticulata* even if, the lineages that gave rise to most of them, have been lost in undocumented antiquity. Since the Roman period, the citron was the only citrus fruit known in the Mediterranean area. A better understanding is necessary of its cultural importance and the role of Jews in its spreading; in fact, since the first century A. D., it became a fixed element in their feast of Tabernacles where played a prominent part. This knowledge is crucial for the development of a

management policy that is aimed both at nature conservation and at improving the livelihood of local producers; they should be encouraged to cultivate this citrus, to allow the historical continuity of a millenary tradition. This fruit that the ancient Greeks and Romans held in high esteem as a delicate and pleasant perfume and moth repellent, represents an exclusive and historical heritage of this strip of Mediterranean land that unconsciously maintains an enormous biblical value.

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References

- [1] Scora, R. W. 1975. "On the History and Origin of Citrus." *Bull Torr Bot Club* 102 (6): 369-375.
- [2] Barret, H. C., and Rhodes, A. M. 1976. "A Numerical Taxonomic Study of Affinity Relationships in Cultivated Citrus and Its Close Relatives." *Syst. Bot.* 1 (2): 105-136.
- [3] Mabberley, D. J. 2004. "Citrus (Rutaceae): A Review of Recent Advances in Etymology, Systematic and Medicinal Applications." *Blumea* 49 (2): 491-498.
- [4] Wu, G. A. 2014. "Sequencing of Diverse Mandarin, Pummel and Orange Genomes Reveals Complex History of Admixture during Citrus Domestication." *Nature Biotechnology* 32 (7): 597-698.
- [5] Zohary, D., Hopf, M., and Weiss, E. 2012. *Domestication of Plants in Old World*. Oxford: University of Oxford Press.
- [6] Nicolosi, E., La-Malfa, S., El-Otmani, M., Negbi, M., and Goldschmid, E. E. 2005. "The Search for the Authentic Citron (*Citrus medica* L.): Historic and Genetic Analysis." *Hort. Science* 40 (7): 1963-1968.
- [7] Loret, V. 1887. *La Flore Pharaonique*. Paris: Leroux.
- [8] Webber, H. J. 1943. "History and Development of the Citrus Industry." In *The Citrus Industry*, edited by Webber, H. J. Berkeley: University of California Press.
- [9] Langgut, D. 2014. "Prestigious Fruit Trees in Ancient Israel: First Palynological Evidence for Growing *Juglas Regia* and *Citrus medica*." *Israel Journal of Plant Sciences* 14 (October): 1-13.
- [10] Nicolosi, E., 2007. *Origin and Taxonomy*. In *Citrus, Genetics, Breeding and Biotechnology*. CAB International: I. A. Khan.
- [11] Cerinotti, A. 1997. *Atlanti Della Storia-Gli Ebrei*. Verona: Demetra.
- [12] Strabo, 1960. *The Geography Vol. 8*. London: The Loeb Classical Library.
- [13] Josephus, F. 1927. *Josephus—The Jewish War Vol. II-III*. London: The Loeb Classical Library.
- [14] Ferorelli, N. 1915. *Gli Ebrei Nell'Italia Meridionale Dall'età romana Al Secolo XVIII*. Torino: Forni.
- [15] Kaufmann, D. 1896. *Die Chronik Des Achimaaz Von Oria, Ein Beitrag Zur Geschichte Der Juden in Suditalien*. Frankfurt: Kaufmann.
- [16] Schipa, M. 1890. *Arch. Stor. Per Le Prov. Nap. Vol. 1*. Napoli: Roux.
- [17] Josephus, F. 1961. *The Jewish Antiquities Vol. IV-IX*. Cambridge: Harvard University Press.
- [18] Pagliaro, A. 2001. *Le Quattro Specie Per Sukkot*. Calabria: ARSSA.
- [19] Tromba, E. 2001. *La Sinagoga Dei Guidei in Epoca Romana*. Reggio Calabria: Istar Editrice.
- [20] Grant, M. 1973. *The Jewish in the Roman World*. London: Weidenfeld and Nicolson.
- [21] Hadas-Lebel, M. 1989. *Flavius Josephus, Le Juif De Rome*. Paris: Fayard.
- [22] Ferorelli, N. 1907. *Gli Ebrei Nell'Italia Meridionale Dall'età Romana a Carlo Borbone*. Torino: Il Vessillo Istraelitico.
- [23] Spiegel-Roy, P., and Goldschmidt, E. 1996. *Biology of Citrus*. Cambridge: University Press.
- [24] Galiano, F. 1994. *Significato Religioso, Culturale Ed Alimentare Del Cedro (Citrus medica L.) Nel Bacino Del Mediterraneo*. Cosenza: Lapico Mediterraneo.
- [25] Galiano, F. 2005. *Alla Ricerca Del Cedro Perduto Tra Sacro e Profano*. Cosenza: Tecnostampa Edizioni.
- [26] De Luca, E. 1994. *Esodo/Nomi*. Feltrinelli: Universale Economica Feltrinelli.
- [27] Morton, J. 1987. *Citron*. In *Fruits of Warm Climates*. Miami: J. F. Morton.
- [28] Galiano, F. 2009. *Il Cedro Tra Desiderio Realtà*. Cosenza: Accademia Internazionale Del Cedro.
- [29] Carrozzino, F. 2007. *Riviera Dei Cedri Di Calabria*. Cosenza: Editalia.
- [30] Perrone, F. 2011. *Il Cedro Nel Tirreno Cosentino: Innovazioni All'insegna Delle Tradizioni*. Calabria: ARSSA.
- [31] Gabriele, B., Fazio, P., Dugo, R., Costa, R., and

- Mondello, L. 2009. "Essential Oil Composition of *Citrus medica* L. Cv Diamante (Diamante Citron) Determined after Using Different Extraction Methods." *Journal of Separation Science* 32 (1): 99-108.
- [32] Conforti, F., Statti, G. A., Tundis, R., Loizzo, M. R., and Menichini, F. 2007. "In Vitro Activities of *Citrus medica* L. Cv. Diamante (Diamante Citron) Relevant to Treatment of Diabetes and Alzheimer's Disease." *Phytother Res.* 21 (85): 427-433.
- [33] Calabretta, M. L., Menichini, F., and Loizzo, M. R. 2008. "Survey on Nutritional Status and Fruit Quality of Citron (*Citrus medica* L.) in Southern Italy." In *Proc. Int. Soc. Citriculture, XI International Citrus Congress, Wuhan, China* 1 (October): 219-221.