

# A review of research and literature related to the origin and identity of the cultivars Plavac mali, Zinfandel and Primitivo (*Vitis vinifera* L.)

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## SUMMARY

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The origin of Zinfandel, the important California wine cultivar, has been a question for several decades. Although Zinfandel has been linked to both Primitivo, grown in southern Italy, and to Plavac mali in Croatia, the puzzle of its origin has never been solved. Many scientists and writers have applied themselves to this question. Many hypotheses have been proposed and some erroneous ideas have been widely accepted. Much of the controversy will now be ended as a result of recent scientific research (Pejić and co-workers, 2000).

Here we review the research and written documentation about Plavac mali, Zinfandel and Primitivo and their relationships and we present the results of recent research.

## KEY WORDS

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*Vitis vinifera* L., Plavac mali, Primitivo, Zinfandel

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# Pregled istraživanja i literature vezanih uz porijeklo i identitet kultivara Plavac mali, Zinfandel i Primitivo (*Vitis vinifera* L.)

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## SAŽETAK

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Porijeklo Zinfandela, važnog kalifornijskog vinskog kultivara, nepoznanica je više desetljeća. Iako je Zinfandel povezivan i sa Primitivom, koji se uzgaja u južnoj Italiji, i sa Plavcem malim u Hrvatskoj, zagonetka njegovog porijekla nikad nije riješena. Mnogi znanstvenici i pisci posvetili su se ovom pitanju. Predložene su mnoge hipoteze a neke krive ideje bivale su široko prihvaćene. Mnoge od kontroverzi trebale bi biti okončane nakon znanstvenog istraživanja Pejić i sur. (2000).

U radu se iznosi pregled pisane dokumentacije o Plavcu malom, Zinfandelu i Primitivu i njihovoj povezanosti i iznose rezultati posljednjih istraživanja.

## KLJUČNE RIJEČI

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*Vitis vinifera* L., Plavac mali, Primitivo, Zinfandel

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## AN OVERVIEW OF THE THREE CULTIVARS

**Plavac mali crni:** The first written records of this cultivar are from Trumer (1841) who wrote that it ("Plavanz zni") came from Dalmatia. In his *Ampelography*, Goethe (1887) included 26 cultivars from Dalmatia, of which 23 were from the island of Hvar as described by I. K. Novak (according to Bulić, 1949). Among them was Plavac mali. Bulić (1949) included a great number of synonyms for this cultivar in his *Dalmatian ampelography* without mentioning its origin, but gave a detailed ampelographic description, including the fact that it matures in the IV<sup>th</sup> period.

Petar Maleš has conducted detailed research on Plavac mali. In his 1981 and 1987 publications he discussed the biological and cultural characteristics of this cultivar and surveyed the "genetic-selective changes in the population of Plavac mali". In more detail he described the ecological conditions in the most important locations where this cultivar is grown. He selected several types and he considers that the population of Plavac mali is a mixture of types: "fertile" Plavac mali, "big" Plavac mali and "small" Plavac mali, each type having specific cultural and biological characteristics.

With regard to the origin of the cultivar, Maleš (1993) wrote that Plavac mali is an autochthonous Dalmatian cultivar and offered as proof that Dalmatia is the gene-center of this cultivar the existence of several types of Plavac mali within the population. He said that the cultivar (Plavac mali) "was carried over to the Italian coast of the Adriatic sea, Puglia-Bari (where it is called Primitivo) and to the west coast of the USA (where it is called Zinfandel)". It was brought to Italy by "... people from the Dalmatian islands (Croatia), and the citizens of Puglia-Bari named it Primitivo".

Other authors who have written about Plavac mali include Licul and Premužić (1979), Fazinić (1971), Sokolić (1992), Mirošević and co-workers (1988, 1996), Mirošević and Maletić (1996), and Mirošević (1998). They all share the same opinion of this cultivar, saying that it is the most important red cultivar of middle and south Dalmatia with the islands and, because it belongs to the group of late to very late cultivars, it gives the best results on the south-facing locations of the islands and the coast.

**Primitivo:** This cultivar is mainly distributed in the Italian region of Puglia (Bari, Brindisi, Foggia, Lecce, Taranto). Eynard and Dalmasso (1990) said that this cultivar got its name because of its very early maturation (precotica di maturazione) (end of August) and because it can go to market very early and is financially very profitable. Ambrosi and co-workers (1988) reported several synonyms for this cultivar—Primitivo and Primiticcio in Italy and Zinfandel in California. Calo (1988) said that Primitivo can also be called Morellone, Primitivo di Gioia, Uva di Corato and Zinfandel. Primitivo was not known in Italy until around 1860 (Calo 1987) and is thought to have been introduced from elsewhere.

**Zinfandel:** This cultivar is the leading red wine grape in the United States (California Agricultural Statistics Service, 1999). Zinfandel is grown in most of the California wine regions, but it gives the best results in the cooler climatic regions (II and III) which are found in the coastal valleys and hills. There it produces rich red wine with excellent flavor and good acidity. A large amount of the fruit produced in the warmer central valley is used to produce a rosé wine (which is called "White Zinfandel"). Good port-style wines can also be produced in the hotter zone IV. Zinfandel matures in early to late September in the hot central valley vineyards but ripens in late September or early October in the cooler coastal vineyards.

Winkler et al. (1974) reported that Zinfandel is similar to the grape called Primitivo di Gioia in Italy. Kerridge and Antcliff (1996) mention that Zinfandel was brought to Australia from California and that it is also grown in Italy under the name Primitivo and in Dalmatia by the name of Plavac mali. Alleweldt (1988) lists Zinfandel as a synonym for Primitivo but not for Plavac mali.

Manaresi (1957) is the only Italian author, as far as we know, who has not linked Zinfandel with Primitivo. He wrote that Zinfandel is the synonym for Frankenthal, in other words Blauer trollinger (by Turković, Tirolane), Gros noir, Schiavona di merano, although Sciafone is, according to Dalmasso and Eynard (1979), a different cultivar. There is also the opinion of Olmo (1975) that the origin of Zinfandel is from Italy and that it is Sangiovese di Chianti. But this is likely a case of confused nomenclature resulting from multiple synonyms. For example, a synonym for the cultivar Sangiovese Cordisco is Montepulciano in some parts of Italy and the same name is also used for Primitivo and Primiticcio (ref Italian ampelography). Although it is still popularly believed by many that Zinfandel was brought to California from Europe in 1862 by Agoston Haraszthy, historical evidence does not support this claim.

## HOW IT BEGAN

The first solid link between Zinfandel and a European grape was made in 1967 by Dr. Austin Goheen, a plant pathologist working for the U.S. Department of Agriculture. He visited southern Italy and there he found 75,000 acres planted with a grape that looked like Zinfandel but which was called Primitivo. It was growing in a warm climatic area and gave very strong wine.

In 1968, the cultivar Primitivo was brought to California and planted in the research vineyard at the University of California at Davis. In 1972 it was compared to Zinfandel and the vines were said to be identical in appearance. In 1975 the first wines were made and the similarity between the cultivars was confirmed (Darlington, 1991).

With the help of his colleague Dr. Lamberti in Bari, Austin Goheen learned that the same or a very similar

cultivar was grown in Dalmatia by the name of Plavac mali or Plavina. Dr. Lamberti had visited, together with Dr. Ana Šarić (now retired professor of the Faculty of Agronomy in Zagreb) Plavac mali vineyards on Hvar, Pelješac and Korčula in the middle 70's through a collaborative American project for the determination of viruses in grapevine. It was through this collaboration that Professor Šarić came in contact with Dr. Goheen. They began to correspond and in a letter of 4 January 1977 Goheen wrote to Dr. A. Šarić:

"... I too visited with Dr. Lamberti last summer. I am not sure whether he had been in Dalmatia at that time or whether he visited you after returning from the U.S. He indicated that he was not sure that Plavac mali was the same as Primitivo di Gioia. I would very much like to make this identification positive. I am going to send you an import permit and request that you send about 5 small cuttings from a Plavac mali vine through quarantine for me... We need this material to check one of the oldest varietal puzzles that we have in California. I am now convinced that Primitivo di Gioia is Zinfandel. If Plavac is also, this might explain how the Hungarian Count Harathzy obtained the original material of Zinfandel even if it does not explain the origin of the name.

The same year Prof. Šarić sent the cuttings of Plavac mali to Goheen to Davis. In 1979, Goheen reported to Prof. Šarić:

"This cultivar (meaning Plavac mali) could be the Italian cultivar Primitivo di Gioia, which is without a doubt the American cultivar Zinfandel. Nowadays comparative research is possible so in a short time we are going to be in a position to determine the European synonyms for Zinfandel, and this is a problem that has confused American vine growers for a long time."

Goheen wrote to Prof. Šarić again in 1982, and said: "The cultivar Plavac mali, which you believed to be the same as the American cultivar Zinfandel definitely is not the same cultivar."

He did not mention the research methods that were used, but we can suppose that he was referring to the research of Wade Wolfe, then a graduate student at the University of California at Davis, who demonstrated by electrophoresis that Zinfandel and Primitivo had the same isozyme pattern (Wolfe, 1975). These same results were referred to by Maleš (1993).

#### REPORTS ABOUT THE ORIGIN OF ZINFANDEL

At the beginning of the 1990's some wine marketing interests in Croatia developed a plan for selling Croatian wine in the USA under the name Zinfandel. This concept was based on the widespread rumor that Plavac mali is a synonym for Zinfandel.

Speculation about Plavac mali and Zinfandel being synonymous came from a very respectable wine producer Mr. Miljenko Grgić (Mike Grgich) who lives and works in the Napa Valley, an important California wine

region. Croatian magazine "Svijet u čaši" (1992) reported Mr. Grgić's statement that: "... Plavac mali, which our ampelographers say is an autochthonous cultivar, is for sure the same cultivar as one abroad very famous as Zinfandel". Also, the same magazine quoted Dr. Petar Maleš, head of the Institute for Adriatic Cultures and Karst Improvement, in Split, who had told the story about Plavac at a meeting "...Plavac mali has been grown on the soil of southern Croatia for centuries, so during that period the cultivar has developed several types, according to the type of soil and microclimate, and from there it spread to southern Italy around Bari. There it was called Primitivo. But they have never managed to make very famous wine. The cultivar was also brought to the USA, where it has become the very famous Zinfandel and where it gives excellent results."

It was previously wrote about Zinfandel and Plavac mali in our newspaper and said that Zinfandel was brought to California by the Hungarian emigrant Agoston Haraszthy between 1851 and 1862, and put up a thesis that it is more likely that he carried vine cuttings from Dalmatia than from Italy.

In the end it seems that Haraszthy did not bring the cuttings either from Dalmatia or from Italy or from Hungary and that, in fact, he probably did not bring them at all. This conclusion is supported by the fact that on the list of things Haraszthy brought into the USA there was no Zinfandel. Charles Sullivan, a California historian, has found convincing newspaper documentation that Zinfandel was imported to the United States (under what name it is not known) from the imperial nursery in Vienna by an American, George Gibbs, probably in 1829, several decades before Haraszthy brought vines to the United States. By the early 1830's it was being sold as Zenfendel or Zinfindal for greenhouse production as a table grape (Sullivan, 1998).

#### THE RECENT SITUATION

Although the origin of Zinfandel is still not clear, research has proven that it is not the same variety as Plavac mali and it is not Plavina, another cultivar that is widespread in Dalmatia.

Professor Carole Meredith has studied all three varieties-Plavac mali, Zinfandel and Primitivo-at the University of California at Davis and has compared their DNA profiles. She has found that Zinfandel and Primitivo have the same DNA profile, confirming that they are in fact the same variety. But Plavac mali has a different DNA profile. In collaboration with researchers from the Faculty of Agriculture, University of Zagreb and local experts in Dalmatia, and with the encouragement of Miljenko Grgić, dipl. ing. Agr., she collected many samples of Plavac mali from vineyards in various locations in Dalmatia. The DNA profiles of the Plavac mali samples were quite uniform and clearly quite different than the DNA profile of Zinfandel and Primitivo. The results of this work are presented in the work of Pejić and co-workers (2000). (Two samples of

Plavina were also analyzed and they were also different than Zinfandel and Primitivo). Without a doubt it is proven that Plavac mali is not the synonym for Zinfandel and Primitivo. However, the DNA results did suggest that Zinfandel is related to Plavac mali so a Croatian origin for Zinfandel is still possible.

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