

PENTATHLON 2015

Preserving Green Olives the Roman Way

A How-To Paper

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This paper will present methods to preserve and brine fresh green olives in the Roman way using modern food safety guidelines, as part of a Roman Matron Pentathlon Theme.

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1.0 Introduction

This how-to paper presents a synthesis of Roman olive curing/brining methods and modern scientific and culinary information. Readers will be presented with several methods to preserve fresh green olives with safe home methods based on extant Roman literature and consistent with modern food safety information.

The author and helpers picked fresh green olives at Great Western War 2014, as black olives were not available at the time (Figure 1). Olives were prepared using both purely Roman methods, and Roman methods including a de-bittering step. Taste-testers preferred the olives with the initial de-bittering process.



Figure 1. Green olives gathered at Great Western War, being examined for quality.

1.1 Sources and Background

Marcus Portius Cato (Cato the Elder) was a well-known Roman statesman and writer from the 2nd-1st century BCE. His work, *De Agri Cultura* was a staple of Roman agricultural reference for hundreds of years (Dalby, 2012). Marcus Terentius Varro (1st-2nd century BCE) was an incredibly prolific writer, including his excellent work *Rerum Rusticarum Libri Tres* (*Three Books On Agriculture*) which heavily quotes Cato (Varro and Cato, 1979). However, Rutilius Taurus Aemilianus Palladius (4th-5th century CE) has the best extant instructions/recipes for preservation of olives, and thus was used for the basis of this document.

To ensure that the olives were preserved using modern food science standards, I consulted the University of California Davis Department of Agriculture and Natural Resources' report on methods of safe home preservation of olives (Yada and Harris, 2007).

2.0 About Olives

Olives, *Olea Europea*, are the fruit of a small tree native to much of the Mediterranean region, as well as portions of Asia and Africa (Yada and Harris, 2007). The usage of the fruit of this tree has been recorded in human settlements as far back as 23,500 years ago (Weiss et al., 2008). It is believed that olives were cultivated as far back as 6,000 years ago (Vossen, 2007). The fruit may be picked at any stage between green (unripe) and black (ripe). These olives may then be cured or used to produce olive oil. Olives may be picked by hand or by machine; for the purposes of this document, all olives were picked by hand to accurately reproduce the conditions they would have been harvested in during Roman times.

3.0 Picking Olives

Olive trees should be heavy with olives, either green or black, have healthy leaves and branches, and be accessible. It is quite simple to gather olives from a tree, all that is required is a container to hold the picked olives, a stool or ladder to reach the higher branches, and perhaps a friend or two to assist in the labor. The author found that the easiest method to pick olives involved grasping the olive branch and pulling gently downwards towards the basket, so that the olives detached from the tree and gently fell into the basket (Figures 2 and 3).

Once the olives have been picked, ensure that they have good airflow, or the moisture contained in the olives will cause them to ferment, mold, or rot (Yada and Harris, 2007). If black (ripe) olives have been collected, process them as soon as possible to ensure they do not over-ripen (Varro and Cato, 1979). Over-ripe or spoiled olives are specifically warned against.

Cato: When the olives are ripe they should be gathered as soon as possible, and allowed to remain on the ground or the floor as short a time as possible, as they spoil on the ground or the floor. The gatherers want to have as many windfalls as possible, that there may be more of them to gather; and the pressers want them to lie on the floor a long time, so that they will soften and be easier to mill. Do not believe that the oil will be of greater quantity if they lie on the floor. The more quickly you work them up the better the results will be, and you will get more and better oil from a given quantity. Olives which have been long on the ground or the floor will yield less oil and of a poorer quality. If possible, draw off the oil twice a day, for the longer it remains on the amurca and the dregs, the worse the quality will be.

Varro: With regard to the olive harvest: the olives which can be reached from the ground or by ladders should be picked rather than shaken down, because the fruit which has been bruised dries out and does not yield so much oil. Those picked with bare fingers are better than those picked with gloves, as the hard gloves not only bruise the berry but also tear the bark from the branches and leave them exposed to the frost. Those which cannot be reached with the hand should be beaten down; but a reed should be used rather than a pole, as the heavier blow renders necessary the work of the tree-doctor. The one who is beating should not strike the olive directly; for an olive struck in this way often tears away the shoot with it, and the fruit of the next year is lost. If the olives, after being picked, lie too long in the piles, they spoil from the heat and the oil becomes rancid; hence, if you cannot work them up promptly they should be aired by moving them about in the piles.



Figure 2. Romans picking olives from Saint-Romain-en-Gal, France. (Photo By Getty Images)



Figure 3. Roman ladies picking olives (Great Western War 2014, faces obscured for identity purposes).

4.0 Processing Olives

Several excellent documents from Roman times address olives. In particular, Rutilius Taurus Aemilianus Palladius' manuscript *De Re Rustica* (On Agriculture) has lengthy sections on olives, olive trees, how to cultivate the trees, and how to preserve the olives (Palladius, 1807). There are numerous ways to process both green and black olives for eating.

Of the olives, Cato writes that the table olives, the *orcites*, and the *posea* are best preserved either green or in brine, or, when bruised, in mastic oil. The black *orcites*, if they are covered with salt for five days after being dried, and then, after the salt has been shaken off, are exposed to the sun for two days, usually keep sound; and that the same

varieties may be satisfactorily preserved unsalted in boiled must. If you take out the preserved white olives soon, while they are fresh, the palate will reject them because of the bitter taste; and likewise the black olives, unless you first steep them in salt so that they may be taken into the mouth without distaste (Varro and Cato, 1979).

For a more modern take on olive preservation, the author turned to the University of California Davis Division of Agriculture and Natural Resources (ANR) (Yada and Harris, 2007). This department provides information on preservation of olives that is consistent with modern health standards and regulations. The ANR provides excellent information on several curing and storage methods that produce delicious results with appropriate modern food safety and health techniques. For the purposes of this report, a combination of Roman and modern methods were used to ensure food safety.

Green olives contain high amounts of oleuropein, a bitter-tasting compound that is leached out by curing and brining processes (Yada and Harris, 2007). Water-cured olives will exhibit more bitterness than those cured by other methods (salting, drying, or lye-curing) (Yada and Harris, 2007) as the oleuropein will not be fully leached out or neutralized. De-bittered olives were preferred by taste testers who tasted the olives that resulted from this paper, as the straight-to-brine methods generally leave more oleuropin in the olive. Cato describes a de-bittering process:

To season green olives: Bruise the olives before they become black and throw them into water. Change the water often, and when they are well soaked, remove water and throw into vinegar-add oil, and a half pound¹ of salt to the modius² of olives.

4.1 Roman Methods

Palladius suggests nine different ways to preserve olives, of which seven are for green olives. We will be discussing four methods in particular.

Method One: 40 Days in Brine, Recipe 1

You will let your olives, when gathered, be macerated in brine: after forty days you pour out all the brine; you will then add two parts of defrutum³, one part of vinegar, some mint shred small, and you will fill the vessel with olives, so that the liquor may properly cover them.

Method Two: 40 Days in Brine, Recipe 2

You first put your olives whole in brine. You will take them out after forty days, and you will cut them in the middle with a sharp reed; and if you wish to have them sweet, you

¹ Probably translated from Libre, which is actually 11.6 oz (Smith, 1851)

² 8.73 liters (Smith, 1851)

³ Grape must reduced by boiling slightly (Palladius page 295)

ought to pour over them two parts of sapa⁴ and one of vinegar; if you wish to have them of a sharper flavor, pour two parts of vinegar and one of sapa.

Method Three: Salt with Herbs, Honey, Oil and Vinegar

You will preserve the olives gathered from the tree immediately. You will strew rue and petroselinum⁵ between them, and you will then heap on some salt mixt with cumin, You will then pour some honey and vinegar over them: lastly you will mix some of the best oil with them.

Method Four: 7 Days in Brine

You sprinkle water over olives, gathered with their pedicles⁶, during three days. You then put them in brine, and after seven days you put them in a vessel with equal weights of must and vinegar, and you will cover the vessel when filled so that you may leave some vent-holes.

4.2 Modern Methods

To prepare the olives for curing, each olive must be pierced or cracked so that the bitter-tasting oleuropein can leach out. The ANR recommends that each olive be pierced or cracked, and that the olives be soaked for 10 or more days in water, with the water being changed every day to ensure that the olives are de-bittered. Soaking for a longer period of time will contribute further to a less bitter olive (Yada and Harris, 2007). These olives should be placed in food-grade plastic containers with a sterile plastic Ziploc type bag with water in it placed so as to ensure all the olives remain in the water and not exposed to air (Yada and Harris, 2007). After the desired period of de-bittering soak, the olives should be brined with a salt, water, and vinegar mixture. These olives must be refrigerated after brining and may be kept for up to a year in the refrigerator. Olives that are immediately brined tend to be far more bitter than ones soaked to remove oleuropein (Yada and Harris, 2007), and are less similar in taste to the lye-cured commercial olives that most modern palates prefer.

5.0 Combination of Modern and Roman Methods

Following are the steps the author took to re-create Roman-style preserved olives using modern, food-safe methods.

⁴ Grape must reduced by 2/3 volume by boiling (Palladius page 295)

⁵ Parsley (*Petroselinum segetum* or *Petroselinum crispum*)

⁶ The stem connecting the fruit to the branch.

5.1 Initial Preparation with De-Bittering

For Roman-style olives, without the de-bittering process, olives may be placed directly into brine after being washed (see Section 5.2). Non de-bittered olives will be more bitter than modern palates generally prefer as the oleuropein is largely still within the olives. De-bittering was certainly known in Roman times (Varro and Cato, 1979), and is described in Cato's writings.

First, wash your olives in clean, cold water, and remove any leaves or other matter that has been accidentally included with the olives. Next, pierce, crack, or slice the olives to allow the bitter oleuropein to leach out (Figure 4).



Figure 4. Green olives after washing and piercing.

Next, place the olives in a sterile container for the water-curing process. Food-grade plastic buckets are recommended, as they are inexpensive and easy to obtain (Figure 5); for a more authentic Roman experience, ceramic vessels that have been disinfected may be used, but these **MUST** be disinfected very carefully before use as they may harbor bacteria or fungus that would destroy the olives and render them unsafe for consumption.



Figure 5. Pierced olives in 6 liter food-grade plastic container, pre-soaking.

Add cold water to the container until the olives float. Ensure that the olives are not exposed to air by taking a Ziploc bag, filling it with an amount of water, and floating this on top of the olives to press them into the water (Figure 6). Exposure to air will cause the olives to mold or rot.



Figure 6. Olives in water with Ziploc bag ensuring no exposure to air. Note the bright green coloration of the olives.

Change the water of these containers daily for 10 days. After 10 days, the olives may be brined; however, I chose to soak them for a longer period to de-bitter them more thoroughly as modern tastes prefer smooth, less bitter olives. The water changed each day will be increasingly more green in color, and the olives will become more yellow in hue.

After the olives have soaked in water for your preferred period of time, they may be brined, or prepared according to the Roman recipes in section 4.1.

5.2 Finishing Methods

I chose the four Roman recipes from Palladius for green olives as listed in section 4.1. Each recipe will be discussed individually.

The recommended brine recipe is one cup of pickling salt and two cups of vinegar per 1 gallon of cool water (Yada and Harris, 2007).

Method One: 40 Days in Brine, Recipe 1

You will let your olives, when gathered, be macerated in brine: after forty days you pour out all the brine; you will then add two parts of defrutum, one part of vinegar, some mint shred small, and you will fill the vessel with olives, so that the liquor may properly cover them.

Take your de-bittered olives and place them in brine for 40 days. After 40 days, drain the brine. To make the defrutum, boil grape juice until it has been reduced by half. Add 2 parts of this to one part of vinegar (white wine vinegar is recommended by the author), and shredded fresh mint leaves to taste. Place in sterilized jars or containers (Mason jars or well-sterilized ceramic vessels with non-cork tops) and ensure that the olives are not exposed to air. Store these olives in the refrigerator for up to one year. This method produces sweetish olives with a pleasant taste of mint.

Method Two: 40 Days in Brine, Recipe 2

You first put your olives whole in brine. You will take them out after forty days, and you will cut them in the middle with a sharp reed; and if you wish to have them sweet, you ought to pour over them two parts of sapa and one of vinegar; if you wish to have them of a sharper flavor, pour two parts of vinegar and one of sapa.

As above, place the olives in brine for 40 days. Slice each olive with a sharp reed if available (bamboo skewers work quite well); otherwise, use a knife. To make sapa, take grape juice and boil it until only 1/3 of the original volume remains. Mix sapa and vinegar (white wine vinegar is recommended by the author) to taste per the instructions. Place in sterilized jars or containers (Mason jars or well-sterilized ceramic vessels with non-cork tops) and ensure that the olives are not exposed to air. Store these olives in the refrigerator for up to one year. These are similar to the olives above but lack mint and are a bit sweeter.

Method Three: Salt with Herbs, Honey, Oil and Vinegar

You will preserve the olives gathered from the tree immediately. You will strew rue and petroselinum between them, and you will then heap on some salt mixt with cumin, You will then pour some honey and vinegar over them: lastly you will mix some of the best oil with them.

To make these delicious olives, take the de-bittered olives, and place them in a sterilized vessel, in layers. Take rue and parsley leaves, shredded, and strew between the layers of olives. Once you have filled the vessel to the top, use the same proportions of salt to liquid as a regular brine (one cup salt per one gallon of liquid). Add 1 teaspoon of cumin per pint of olives. The author prefers a mixture of equal amounts honey and vinegar to fill the vessel $\frac{3}{4}$ to the top, then topping the vessel off with a high quality olive oil. Store this in the refrigerator to prevent the oil from going rancid. This method produces delicious olives with a uniquely Roman flavor.



Figure 7. De-bittered olives ready for the honey, vinegar and oil mixture of Method Three.

Method Four: 7 Days in Brine

You sprinkle water over olives, gathered with their pedicles, during three days. You then put them in brine, and after seven days you put them in a vessel with equal weights of must and vinegar, and you will cover the vessel when filled so that you may leave some vent-holes.

To make this style of olives, take the de-bittered olives and brine them for seven days (The author tried the listed Roman method with green stemmed olives that had not been de-bittered and found the results inferior to de-bittered olives without stems). After a week, remove the brine and put the olives in a sterilized vessel with equal amounts of must and vinegar. The original Roman recipe requires fermentation; the vent holes allow fermentation gases to escape. If these olives are stored per modern food safety instructions, they must be stored with loose caps/covers for 70 degrees for up to 2 months; after 2 months they may have their lids/covers tightened and may be stored for up to 1 year in a cool and dark place (refrigeration is recommended) (Yada and Harris, 2007). This method produces fermented, briny olives that are reminiscent of pickled vegetables.



Figure 8. Finished olives, left to right: Method Four, Method Three, Method One.

6.0 Conclusion

This paper has presented four Roman recipes for green olives, discussed the Roman and modern ways of preservation, and presented food-safe and modern methods to reproduce these recipes.

Processing and preserving green olives using modern food-safe methods combined with extant Roman recipes is simple and can be done in almost any kitchen. Each of the four methods discussed in this paper produces delicious, period olives with a uniquely Roman flavor set that are appropriate to modern palates.

De-bittered olives were responded to by taste-testers more favorably than those that had not gone through the de-bittering process. Olives prepared purely according to the straight-to-brine Roman methods tended to be more bitter and the flesh of the olives was less soft.

7.0 References

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