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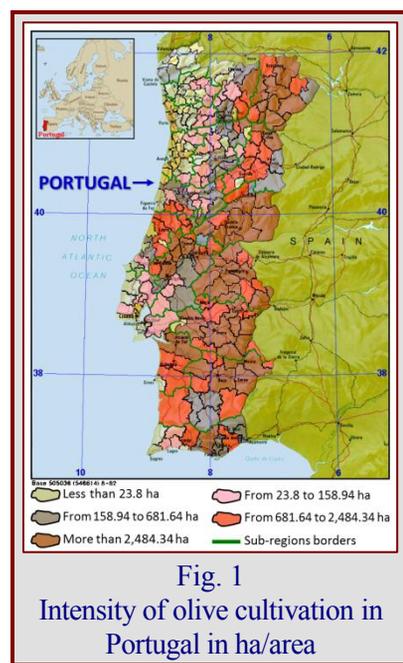
INTRODUCTION

With a population of ten million inhabitants, Portugal occupies the western part of the Iberian Peninsula, bounded on the west and south by the Atlantic Ocean and on the north and east by Spain. Portugal is a territory of 89,971 km², including the *Região Autónoma dos Açores* (Azores Islands) with 2,322 km² and the *Região Autónoma da Madeira* (Madeira Islands) with 801 km². Its shape is roughly that of a rectangle, with its short sides on the north and south (286 km) and its long sides on the east and west (577 km), 36° 57' 42" to 42° 09' 15" north of the Equator and 06° 11' 20" to 09° 31' 01" west of the Greenwich Meridian (Fig. 1).

Administratively, the continental Portugal is divided into 18 districts within five regions; these are Norte, Centro, Lisboa, Alentejo, and the Algarve. Although the districts are currently in a process of being phased out, they are socially recognizable territorial divisions of the country.

In spite of being a small country, Portugal has a wide variety of landforms, climate, and soils. The major contrast is between the mountainous regions of the north with its highest peak at the Serra da Estrela (2,000 m) and across the Rio Tejo, the great rolling plains of the south in Alentejo (<1,000 m). The 2007 Farm Structure Survey recorded 275,000 farm holdings in Portugal, representing a 15% decrease since 2005. These farms occupied 3.3 million ha of utilized agricultural area, 5% less than in 2005, which makes 18 ha the average size of a farm holding in Portugal, compared with 16 ha in 2005.

Portugal has a Mediterranean climate with hot, dry summers and mild winters, especially in the south, which is considered as one of the warmest European



territories, with high summer temperatures moderated by sea breezes. In the north the weather is wetter, and cooler, particularly in winter. The country receives an average rainfall of 708 mm/year. This climate has always offered high potential to grow olives under rain-fed conditions. Therefore, in 2007 olive orchards occupied 292,162 ha in mainland Portugal representing 49.51% of the land used for permanent crops (590,156 ha). Olive was followed by vineyards with 172,765 ha (29.27%), nuts 68,877 ha (11.67%), fresh fruits 36,800 ha (6.24%), citrus fruits 18,083 ha (3.06%) and finally subtropical fruits 1,469 ha (0.25%).

OLIVE CULTIVATION HISTORY

In Portugal, although there are remnants of the presence of the olive tree from the Bronze Age, it would have been the Romans and later the Visigoths and Arabs that contributed mostly to the development of its cultivation.

According to several paleontological studies, the presence of olive trees (*Olea europaea* var. *europaea* and its ancestor, the *Olea europaea* var. *sylvestris*) in this territory goes back several millennia BC. However, olive oil was brought in by the Phoenician and Greek merchants. Later on, after 218 BC, the Romans, in the ancient Roman province of Lusitânia, south of the Douro river, expanded and refined its production. Testifying these developments at a later period in history, the ancient Greek philosopher, historian and geographer Strabon (ca. 64/63-24 AD) mentioned exportation to Rome of olive oil from the Alentejo plains.

Both Gaius Caecilius Cilo, a magistrate of Ancient Rome (ca. 61-112 AD) and Gaius Plinius Secundus, a Roman naturalist and philosopher (23-79 AD) reported that high quality oil was locally produced. Also, the Visigothic code, comprising of a set of laws circulated during the late Roman Empire, prescribed heavy sanctions in order to protect olive trees from vandalism and misuse. As early as 1170 AD olive trees were accounted for in the records of land grants awarded by the first Portuguese king Afonso Henriques to the new settlers in Lisboa, Almada, Palmela and Alcácer do Sal. Similarly, land grants for Algarve (1269) and Évora (1273) extensively refer to the cultivation of olive trees in those regions. Reports for plantations in Évora and Coimbra date back to the beginning of the 14th and 15th centuries, during the reign of King João I. These old plantations became most abundant, mainly between Coimbra and Évora, extending through the valley of the Tagus from Santarém to Lisbon.

In the 16th century, Portuguese olive oil and wine had a privileged position in the list of products exported to Flanders, Castile, León, Galicia, India and Brazil. Matching with such trade, the “Rules for Press Operators of Olive Oil Presses” were the first standards written for the job of “olive press operator”. They emerged in 1572 as a part of the rules for the mechanical occupations of the City of Lisbon. Licenses for Master of the olive press were given to the candidates, after they had been thoroughly examined, by taking an oath on the Holy Gospels. Thus, the quality



of the olive oil and the professional competence of the producers were guaranteed. During the 18th century, Santarém became the main producing region, and by then, the country was already recognized for its high quality olive oil, leading to a prestigious award at the Exposition Universelle (World's Fair) of 1889, held in Paris.

With the Portuguese maritime expeditions to the African, Asian and American continents, olive oil and salted olives were presented to many parts of the world and took a major role in the trade made with these far off lands.

With the emergence of the margarine era in the 1960's, Portuguese olive oil production and consumption decreased, mainly because it was not considered economically viable competing with low priced fats that people at that time did not recognize well its negative health impacts. At the beginning of the 1990's, olive oil consumption started to grow due to growing awareness of its health benefits and the stumbled industry started to regain its momentum through cultivating new olive orchards.

AREA UNDER OLIVE CULTIVATION

The olive growing area has been steadily increasing for the last decades in all regions of continental Portugal, from 316,396 ha in the 1989 Agricultural Census (RGA89) to 386,824 ha in 2009. Nearly 80% of this area is located in the southern regions; with Alentejo and Centro having the highest shares of about 174,170 ha (45%) and 120,351 ha (31.1%), respectively. The 70,000 ha area increment was developed in Norte, Centro and Alentejo, especially in the last two. Olives are not grown in the Azores and Madeira Islands. The expansion of olive growing area is taking place mainly in Alentejo, with 15,000 ha of new intensive and super-high-density irrigated orchards. The most evident consequence of such new areas is the change in the



Fig. 2
Traditional rain-fed olive orchard of low density
with detail of an old tree (inside frame)

average age of olive orchards. In 1999, the prevailing distribution of olive orchards showed the supremacy of orchards over 50 years old (74%) and a very small share of those less than 15 years old (15%). Today, in spite of the steady increase in the number of new orchards, the old ones still dominate the landscape, representing around 65% of the national olive orchard area, intertwined with a 15% increase of new plantations (<15 years old).

Olive orchards are traditionally dry-farmed (Fig. 2), comprised of approximately 100 trees/ha (10x10 m or 12x12 m tree spacing). The trees are widely spaced to take

full advantage of the stored water from winter rains towards spring and summer growth. Some are in the process of being converted to drip irrigation. In recent years, and due to the



Fig. 3

New irrigated super-high-density and intensive orchards

rising interest of growers in increasing the size of their olive orchards, hundreds of orchards have been established with drip irrigation to ensure good productivity. Some of these orchards are of intensive (≥ 300 trees/ha on 7x5 or 6x5 m spacing) and some are of super-high-density ($\geq 1,700$ trees/ha on 3.75x1.35 m tree spacing) (Fig. 3). That trend increased olive tree productivity, pushing up the national olive production more than two fold, from 175,000 tons in 2000 to 425,000 tons in 2009.

According to the 1999 Agricultural Census (RA99), only 14,130 ha of the existing 335,028 ha were irrigated, corresponding then to only 4.2% of the total. Today, the new orchards are drip irrigated, particularly in Alentejo and in 2009 the irrigated area was estimated to be around 10% of the total. However, dry-farming orchards are still dominant, making the national olive productivity low at only 1,096 kg/ha in 2009, which is directed almost entirely to olive oil production. Only 11,235 ha (2.9%) are devoted to table olive, a constant share that has not changed in the last two decades.

OLIVE CULTIVARS

Most Portuguese cultivars are mainly used for olive oil production. There are two olive cultivars with national importance, the ‘Galega Vulgar’ and the ‘Cobrançosa’. The trees of both show strong vigor, dense canopy and erected habit. They are very productive, with early production and alternate bearing, showing low capacity for vegetative propagation. Trees are very susceptible to Anthracnose (*Colletotrichum gloeosporioides*), and as to oil extraction and characteristics fruits are usually low in oil content, however, it is very stable. Both have medium fruit maturity. Following are some main features of the important cultivars:

‘**Galega vulgar**’ (Fig. 4) is widely used in Portugal for olive oil production. However, within rural communities this cultivar is also used for table olive, mainly processed by traditional methods to produce excellent black pickled olives, albeit with small size. A great percentage of the national table olive production comes from this cultivar, though the bulk is prepared by homemade methods and consumed domestically.



Fig. 4

‘Galega vulgar’

The final quality may depend on the composition of the fresh fruits, production technologies and environmental conditions during the fermentation processes.

‘Cobrançosa’ (Fig. 5). Trees are tolerant to cold and iron chlorosis. The fruits have average oil content. Its natural fruit drop during ripening is minimal.

The other Portuguese cultivars have only regional importance. The prominent ones in the northern part of the country are the ‘Madural’ and ‘Cordovil de Trás-os-Montes’, while in the south the most important ones are ‘Carrasquenha’, ‘Cordovil de Serpa’ and ‘Verdeal Alentejana’ (Fig. 6).



Fig. 5
‘Cobrançosa’



Fig. 6
‘Verdeal Alentejana’

Over the past forty years, a lot of foreign cultivars were introduced, mainly from Spain, especially in the central and south-central parts of Portugal at Ribatejo and Alentejo respectively. In the 1980’s, mostly the Spanish ‘Picual’ dominated, but lately, in the super-intensive plantations, the Spanish ‘Arbequina’ and the Greek ‘Koroneiki’ are the dominant ones, with the Spanish ‘Hojiblanca’ and the Italian ‘Leccino’ found in smaller areas.

IMPACT ON ECONOMY AND ENVIRONMENT

The main permanent crops in Portugal are olives and vines, planted in almost all farm lands. In 2005, olive orchards accounted for 40% of all farms, occupying almost half of the area devoted to permanent crops (vines, fruit trees, etc.) and 10% of the Utilized Agricultural Area (UAA), surpassed by permanent pastures only.

The average national size of olive orchards is around 2 to 4 ha per UAA. However, an increase in size of the newly established olive orchards, with the highest value of 6.9 ha per UAA, is reported in Alentejo. The largest olive orchards are located in this region; with several being of 500 ha or larger, and quite a few with more than 1,000 ha.

In 2009, Portugal produced 53.4 thousand tons of olive oil (IOC data), which is almost twice the quantity produced in 2000. The share of Alentejo in this quantity was 55.6 % and that of Centro was 25.5%. This amount of olive oil was produced in 562 mills, mainly located in Centro (311 mills), followed by Norte (139 mills). Only 104 mills are located in Alentejo, however, they are the largest ones operating in the country.

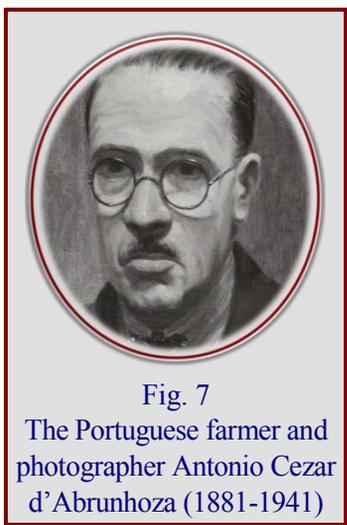
The increment in the area of olive orchards, and the higher productivity, explain the sustained increase in national olive oil production. Nevertheless, self-sufficiency is

still only 60-70% of domestic consumption estimated at around 80 thousand tons/year, while part of the production is exported to Brazil, Venezuela, USA and Canada.

Currently there are six regions with the title Protected Designation of Origin (PDO), which certifies the quality of the olive oil (*Azeite*) produced in each region according to its main olive cultivars. In 2007 the area devoted to grow PDO olives was around 33,608 ha, corresponding to 8.8% of the total olive area reported for the year. A total of 231,235 liters was certified as PDO oil production, equivalent to 6.6% of the total oil production in 2007. This quantity was obtained from olives of 7,517 orchards, of which 5,850 were located in the region of Azeites de Trás-os-Montes, attesting the small size of orchard holdings in this PDO region.

INHERITED CULTURAL PRACTICES

Although oliviculture in Portugal is not as wide spread as it is in neighboring countries of the European Union, yet there are deep rooted cultural practices some of which have changed little over time. With the exception of mechanical harvesting with over-row harvesters in super-high-density orchards and trunk shaking of adaptable trees in old orchards, table olives are still harvested by hand in different ways, though expensive. For a documentary book like this one, following the adage "A picture is worth a thousand words" is the best approach to portray some of the old traditional cultural practices that were performed in Portuguese olive orchards during the 1920's-1930's as caught with the eyes and camera of Antonio Cezar d'Abrunhoza (1881-1941) (Fig. 7) who was a farmer in Beira Baixa, a region in the center-east of Portugal. He was also an amateur photographer. D'Abrunhoza was born into a prosperous family which gave him an education even although he was a deaf mute. His disability may have highlighted his interest in the visual world, a



world he captured with rare beauty. All photographs (Fig. 8, 9 and 10) are used with the appreciable permission of his family. These photos were published in 2003 in the book "Olivais e Lagares".



Fotografias de Antonio Cezar d’Abrunhoza”, ISBN: 972-95881-4-7, coordinated by Maria Inês de Abrunhosa Mansinho and edited by the Portuguese Horticultural Association (Associação Portuguesa de Horticultura-APH).

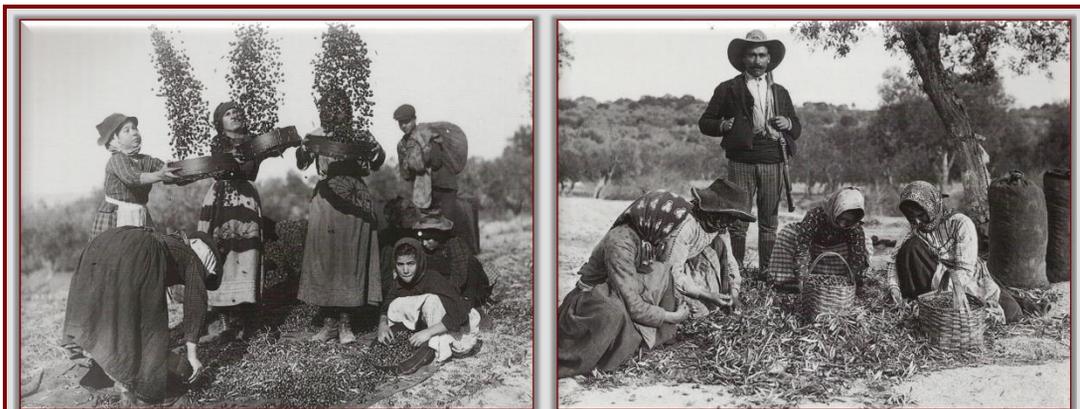


Fig. 9

Women olive pickers de-leafing harvested olives, then sorting and packing them in hessian bags (1920’s)

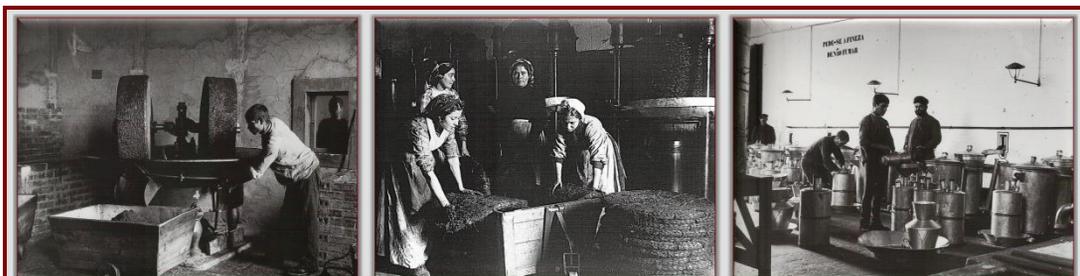


Fig. 10

Olive mill operations in the 1920’s

TABLE OLIVE PROCESSING METHODS

In Portugal, table olive processing is mostly uses artisanal or homemade methods, with accessibility to localized markets in the countryside and in small towns. The artisanal processing method takes advantage of the natural micro-flora on the fruit, and uses some selected flora which helps fermenting the fruit. Prior to fermentation, olives are soaked in water that is changed daily. After washing, olives are slit deeply with a small knife, one by one; the largest fruits are slit in multiple places and subsequently immersed in a brine of 8-10% (w/v) salt. After some weeks the concentration drops from 10% to around 5 to 6%, after the water in the olives moves into the solution and the salt penetrates the olives. The olives are edible within two weeks to one month, but can also be left to cure for up to three months. This type of table olives maintains some of their bitter taste. Olives can also be flavored by adding various marinades to the solution, or removing the pit and stuffing them. Popular flavorings are herbs, spices, olive oil, capsicum, lemon and/or orange, garlic

cloves, vinegar, almonds, and anchovies. Sometimes, after washing and brining, if the olives are not slit, they are lightly cracked with a hammer or a stone to trigger fermentation. This method of curing adds a slightly bitter taste to the olives.

OLIVES AND CULTURE

No better place to witness the love affair of the Portuguese with olive trees, olives and olive derivatives than in the traditional *Quadras* or folk quatrain compositions forming rhythmical songs chanted in the daily routine of picking olive, harvesting or preparing meals. An expression of those *Quadras* follows:

Quadra popular
Avarejai avarejadores,
Apanhai apanhadeiras,
Apanhai baguinhos de oiro,
Que caem das oliveiras.
Oliveiras, oliveiras,
Ao longo são olivais,
Por muito que tu me queiras,
Ei 'inda te quero mais.
Ó Senhor da Piedade,
Lá no mei' dos olivais,
Guardai-me a minha azeitona,
Não a comam os pardais.
Oliveira no adro,
Dá a toda a igreja,
Quem tem seu amor ao lado,
Tem tudo quanto deseja.
Vivam todos quantos estão,
Viva o nosso manageiro,
Viva também o patrão.

Folk quatrain (free English translation)
Move those sticks, olive shakers,
Pick up fast, olive pickers,
Pick up those golden beads,
Falling from olive trees.
Olive trees, olive trees,
By large connecting orchards,
No matter how much you love me,
I do love you even more.
Our Lord of Pity,
In the middle of the orchards,
Watch over my olives,
Keep them from the sparrows.
Olive tree in the church yard,
Giving to all coming through,
Who's love is by their side,
Their wishes have come true.
Blessed be all that came forth,
Blessed be our manager,
Blessed be also our boss.

RECIPES WITH OLIVES AND OLIVE OIL IN NATIONAL COOKING

The interaction of Portugal with other cultures (Celts, Romans, Moors and Spanish) is particularly noticeable in its cuisine. One of the most important ingredients of Portuguese cuisine is olive oil. In addition, culture and tourism are fundamentally related to gastronomy and, consequentially, olives and olive oil are a “bridge” between them.

The Portuguese cuisine is based on simple preparations to allow the quality and simplicity of food ingredients to stand out. It is characterized by its rich, filling and full-flavored dishes, closely related to Mediterranean cuisine. Bread and aromatic herbs are the essential ingredients that give body and taste to soups, *migas* (bread purée), *ensopados* (stews) and *açordas* (ragouts), with olive oil used as the main ingredient, both for cooking and flavoring meals. Although in early history the Portuguese used olives in their diet, but like many Mediterranean countries, the



Romans were the ones responsible for locally introducing the fine art of producing and extracting higher quality olive oil. Nowadays olive oil is undoubtedly the primary fat used in the preparation of Portuguese dishes and also one of the main and most used seasonings and condiments.

Some of the most popular recipes in Portuguese cuisine are soups, which are at the heart of the traditional cuisine. Made out of all kinds of vegetables, fish and meat; creating a rich assortment of soups, stews and chowders, all spiced up with olive oil. Originating from the Northern Province of Minho, soups are now deeply-rooted in the cuisine of all regions. Four traditional recipes are given below:

➤ **Caldo Verde (Collard Greens Soup)** (Fig. 11) is probably one of the most typical; it is made of dried active baking yeast, sugar, polenta, warm water, salt, olive oil and corn flour. The soup is prepared with extra virgin olive oil (*azeite*), potatoes and julienned collard green, thin slices of garlic, and served with corn bread (*broa*), olives and red wine. The Portuguese green cabbage, dark-green and very aromatic, has to be shredded in very thin strings and cooked in a light stock of potatoes and olive oil and spiced up with a few slices of Portuguese pork sausage *salpicão* or *chouriço*.



Fig. 11
Collard greens soup

➤ **Bacalhau cozido com batatas e couves (Boiled Salted Cod with Potatoes and Cabbage)** (Fig. 12):

Ingredients: 8 cod fillets (reconstituted), 4 Portuguese cabbages, 16 large potatoes, 8 hard-boiled eggs, 1 cup of extra virgin olive oil, 4 cloves of garlic, salt and pepper.

Method: Boil the cod for 15 to 20 min. In a separated pan; boil the cabbage (after removing the external hard leaves) and in another pan boil the previously washed potatoes with skin. To prepare a desirable amount of sauce, peel the garlic cloves and cut them in thick slices. Heat the extra virgin olive oil, and as soon as it is hot, add the slices of garlic until tender (do not let it burn or turn brown). Dress the cod, with this sauce, at the table. Serve with corn or whole grain bread.



Fig. 12
Cod with potatoes
and cabbage

➤ **Borrego assado no forno (Roasted Lamb with Olives)** (Fig. 13):

Ingredients: 1 medium sized lamb, ½ cup of extra virgin olive oil, slices of bacon, 4 onions, 4 cloves of garlic, 2 bay leaves, parsley, 1 cup of white wine, 1 teaspoon paprika, ½ kg of small roasting potatoes, margarine, and salt and pepper.

Method: Mince two onions, the garlic cloves and the bacon, add a ¼ cup olive oil, paprika and ⅓ cup white wine, season with sea salt and pepper. Coat the lamb with the preparation. In a large roasting pan roast the remaining onions cut in



Fig. 13
Roasted lamb with Olives

slices, adding some olive oil. Add the lamb, parsley and bay leaves and let marinate for 24 hours in a cool, fresh place. Add the remaining white wine, the peeled potatoes and season with salt and pepper. Add some margarine and roast in the oven, basting once in a while. Serve with green and black olives.

➤ **Folar da Páscoa (Easter bread)** (Fig. 14):

Ingredients: 1 kg of regular flour, 1 cup extra virgin olive oil, 50 g of baker's yeast, 100 g of sugar, 3 eggs, $\frac{1}{5}$ cup of regular milk, a pinch of salt, 1 teaspoon of ground anise (*erva-doce*), and 1 teaspoon of cinnamon.

Method: Dissolve the yeast in warm milk, with $\frac{1}{4}$ kg of flour to make dough, and let it rise. Mix the remaining flour with the eggs, sugar and milk, to obtain light dough. Add olive oil, salt, anise and cinnamon. Work the dough well and add it to the first batch of risen dough. Work the dough. Cover and let rise for 2 to 5 hours in a warm place. Divide the dough in shaped balls and flatten them. On each one place one or more hard boiled eggs. Brush dough and eggs with egg yolk and bake in a hot oven until brown.

➤ **Portuguese orange-olive oil cake** (Fig. 15):

Ingredients: for serving 10-12 persons: nonstick baking spray with flour, 4 to 5 large navel oranges, $3\frac{1}{2}$ cups all-purpose flour, $1\frac{1}{2}$ teaspoons baking powder, $1\frac{3}{4}$ teaspoons salt, 5 large eggs, 3 cups granulated sugar, $1\frac{1}{2}$ cups extra virgin olive oil, confectioners' sugar for sprinkling.

Method: Put up the oven to heat to 175° C. Coat a tube pan with baking spray and set aside. Finely grate the zest of 3 of the oranges, squeeze 4 or 5 of them to have at least $1\frac{1}{2}$ cup of juice and set aside. Whisk the flour, baking powder, and salt in a large bowl and set aside. Beat the eggs with a mixer in a large bowl until well combined. Slowly pour in the granulated sugar and continue beating until thick and pale yellow. Alternately add the flour mixture and oil, starting and ending with the flour, and beat until just a few wisps of flour remain. Pour in the orange juice and zest and whirl for a few seconds to bring the batter together. Pour the batter into the prepared pan and bake until a cake tester comes out with a few moist crumbs clinging to it, about $1\frac{1}{4}$ hours. If the top is browning too much as the cake bakes, cover lightly with foil. Transfer to a wire rack and cool for 15 minutes. Turn the cake out onto the rack and cool completely, then place it in a covered cake stand and let it sit overnight. Just before serving, dust with powdered sugar.



Fig. 14
Easter Bread



Fig. 15
Orange-olive oil cake
(Photo by Zeinab Seoudi)

OLIVES AND TOURISM

Aside from many people camping in old olive orchards (Fig. 16, next page), there are two well-known olive touristic activities in Portugal, the “Olive Oil route in Trás-os-Montes” to the North and the “Olive Oil route in Alentejo”; both take visitors through special programs to see and enjoy the traditional making of olive oil, as well





Fig. 16
Camping in old olive orchards

as to inform them about the potential richness of olive growing in those regions. Besides, the visitors have the opportunity to take part in the olive harvest, using traditional and ancient methods, as well as seeing how olive paste is made for oil extraction.

The “Olive Oil route in Trás-os-Montes”, coordinated by the Associação Comercial e Industrial de Mirandela, has 15 itineraries grouped in four touristic destinies (www.rotadoazeitetm.com). These have names like “At the center of Trás-os-Montes”, “In-between rural and urban”, “In the land of formidable wines and olive oils”, and “From the capital of Manueline architecture to the prehistoric, rock art in the Côa Valley Archaeological Park of Portugal”. The Manueline or Portuguese late Gothic is a sumptuous Portuguese architectural style incorporating maritime elements and representations of 16th century motifs of the discoveries era.

The “Olive Oil route in Alentejo”, coordinated by the Centro de Estudos e Promoção do Azeite do Alentejo (CEPAAL) and the Associação para o Desenvolvimento dos Municípios Olivícolas (ADEMO), has three main programs to offer (Short, Medium and Complete). They allow visitors to know and enjoy the local culture and folklore around olive and olive oil sites in the 3 PDO regions of Alentejo (Norte Alentejano, Alentejo Interior and Moura). The itineraries include visits to orchards, mills, listening to folk groups, guided visits to historic monuments and museums related to olive growing, processing and oil making among others (www.azeitesdoalentejo.com).



Fig. 16
Mohamed El-Kholy under the shade of old olive trees in the garden of Afonso de Albuquerque Square

The City-Hall in Mirandela also promotes the “Olive route” under the Terra Olea Project offering the visitor a touristic package specialized around the olive and olive oil (<http://www.cm-mirandela.pt/index.php?oid=897>).

Within few hundred meters apart in Belém municipality of the capital Lisbon lie few of the touristic attractions of the city like the Belém Tower, Belém Palace, Jerónimos Monastery and the Coach Museum. Many visitors normally take a rest after their tours in the garden of Afonso de Albuquerque Square where they enjoy the shade of the old olive trees fused with the refreshing breath from the Tagus River.

OLIVE WOOD USES

Traditionally, olive wood is used as winter firewood. However, more recently it has been used for the artisanal production of furniture and decorative pieces and carving. Sun-dried, high quality and authentic olive wood logs are used in the process.

