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Herbs and spices in traditional recipes of Alentejo (Portugal)

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Alentejo representing about 30% of the area and 5% of the population of Portugal is a semi-arid region of undulated plains with the Mediterranean climate softened by the Atlantic, characterized by mild winters and hot dry summers. With an old history of scarcity and pauperism, it shows very particular cultural traits including a unique culinary tradition, with a high use of wild plants, herbs and bread based dishes.

The objective of this work is to characterize the particular culinary of this area, once called a country within a country (Feio 1983), especially in what concerns the use of herbs and spices.

Materials and methods

The recipes database was construed from various sources including inventories, culinary books on traditional foods, unpublished ethnobotanical studies and personal communications. Because of space limitations, the complete list of sources is not presented, but is available upon request to the correspondence author.

Sweets and desserts were not considered, and only recipes with at least one herb or spice in their composition were included in the database. Although named differently, some of the selected recipes were identical and 15 were excluded from the database.

The structure of the database, with recipes described by binary coding the presence of ingredients, was elucidated by correspondence analysis (Benzécri 1976). Automatic classification of recipes was done on reduced space by the mixed method using Ward's criteria of aggregation (Lebart, Morineau, and Piron 2000). Correspondence analyses and clustering were done using SPAD[®] procedures (Lebart et al. 1996).

Results

After removing duplicated recipes, the database comprised 325 recipes and 76 ingredients. Ingredients per recipe ranged between 3 and 18, with a mean (\pm SE) of 8.7 ± 0.13 and a median of 9.

Vegetables are present only in 80 recipes (24.7%), 24 different vegetables are cited, mostly cultivated like carrots, cabbages, turnips and spinach. Eight wild plants were present in 30 recipes (0.9%), the most important being asparagus (9 recipes), thistles (7 recipes) and purslane (5 recipes).

As for herbs and spices, garlic and onion are by far the most used, respectively in 79.1% and 64.9% of recipes (Fig. 1), followed by bay leaf (48.0%), parsley (33.5%), white pepper (23.7%), paprika (22.8%), coriander (21.8%), cloves (13.2%), and pennyroyal (10.5%). However, garlic and onion, given the quantities used, are more than a condiment and must be considered as a truly aliment in most of the recipes.

Additionally, spearmint (9.2%), red pepper (8.9%), black pepper (6.8%), lemon (6.5%), oregano (4.9%), marjoram (3.4%), water mint (3.1%) nutmeg (3.1%), chili pepper (2.8%), garlic leaf (2.5%), cumin (1.5%) and orange (1.5%) are frequently used being present in 1 to 10% of the recipes.

More rare is the use of rose pepper, rosemary, and sage (0.9%), onion leaf, savory, and french lavender (0.6%) and even rarer that of green pepper, thyme, basil, saffron, curcuma, cinnamon, and lemon verbena (0.3%), only with a vestigial expression.

A first correspondence analysis singled out an outlier recipe, 'arroz amarelo e do outro' (yellow and other rice), largely due to the exclusive presence of

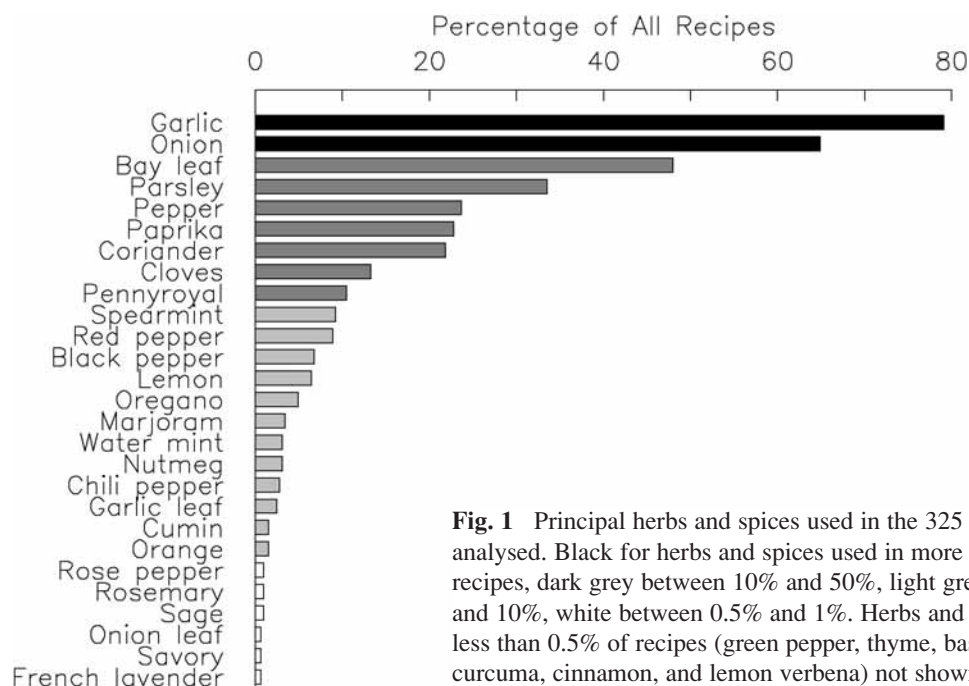


Fig. 1 Principal herbs and spices used in the 325 recipes analysed. Black for herbs and spices used in more than 50% of recipes, dark grey between 10% and 50%, light grey between 1% and 10%, white between 0.5% and 1%. Herbs and spices used in less than 0.5% of recipes (green pepper, thyme, basil, saffron, curcuma, cinnamon, and lemon verbena) not shown.

saffron and yellow ginger. Therefore, this recipe was excluded and data reanalyzed.

The optimal classification based upon the first two factors of correspondence analysis (9.9% of total inertia) resulted in three classes (Fig. 2).

Class 1, comprising recipes with an 'excess' of ingredients compared with the whole database (9.2 ingredients per recipe, 154 recipes), is essentially composed by meat dishes (meat, blood, and animal fats) associated with 13 herbs and spices (garlic, onion, bay leaf, parsley, pepper, cloves, red pepper, black pepper, lemon, marjoram, nutmeg, cumin, and orange as well as wine).

Class 2, comprising recipes with a 'deficit' of ingredients (8.2 ingredients per recipe, 128 recipes), is essentially composed by bread based dishes (bread, flour, olive oil, eggs, codfish, fish, cheese, legumes, and vegetables) associated with five herbs and spices (garlic, coriander, pennyroyal, oregano, water mint, and green pepper as well as vinegar).

Class 3, comprising recipes with greater 'deficit' of ingredients (8.1 ingredients per recipe, 42 recipes), clearly opposed to the former in the first factor, is essentially composed by broad beans and vegetable dishes (plus meat, bones, sausage, ham, salted pork fat, potatoes, pasta, and bread) associated with three herbs and spices (spearmint, garlic leaf, and onion leaf as well as sugar).

Discussion

Inventories like this can hardly be completely exhaustive, and therefore more herbs and spices may have a place in the traditional culinary of Alentejo. However, the most important herbs and spices were certainly found, and it is interesting that the most used herbs and spices, garlic, onion and the others present in more than 10% of the recipes, are mostly local products. Only pepper and cloves are imported spices of exotic origin while bay leaf, parsley and pennyroyal may be cultivated or gathered in the wild. All of them, except pennyroyal only seasonally present in the more traditional markets, may be easily purchased.

It is also worth mention that although a great variety of edible wild plants are consumed in this area (e.g. Pinheiro 2004; Ramos 1997; Salgueiro 2004) its presence in the recipes is low. This can partly be explained because most of them are used raw, without preparation, in salads and others simply boiled. In fact, only few wild vegetables seems to attain the honour of being object of a recipe and in the universe examined only eight were present as ingredients.

The characterization of the three classes shows that meat, blood based recipes or recipes with animal fats associated with 13 herbs or spices plus

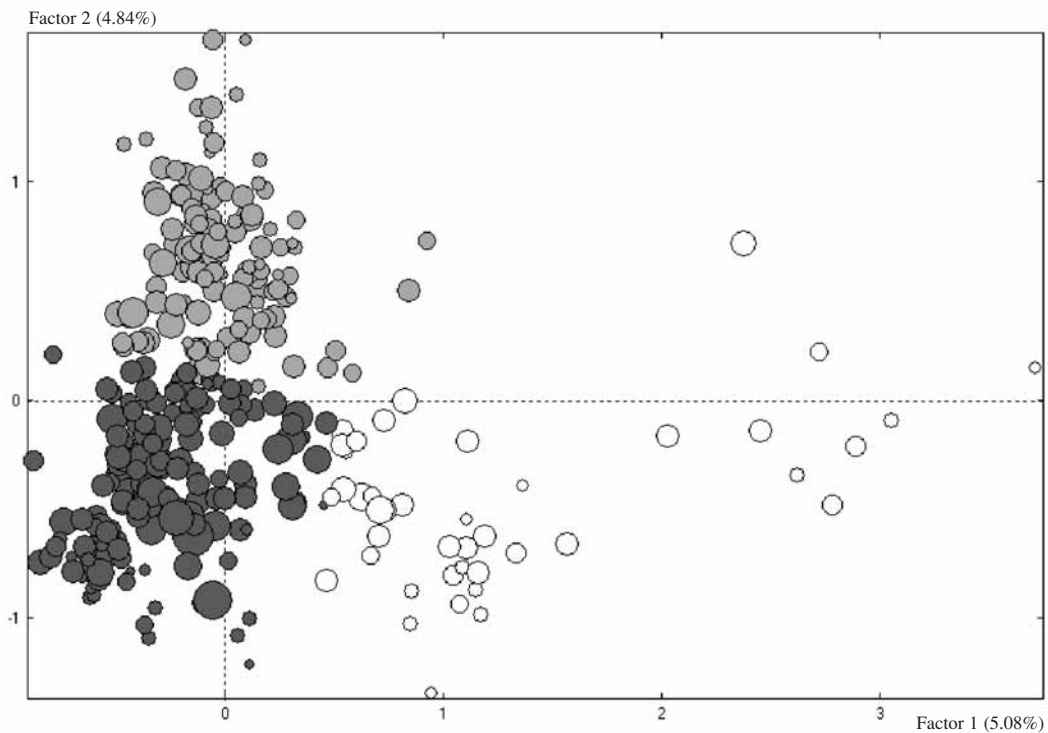


Fig. 2 Ordination of recipes in the two first factors of the correspondence analysis. Sizes are proportional to relative weights. Recipes of class 1 in dark grey, of class 2 in light grey, of class 3 in white.

wine (class 1) are more spicy than the other recipes, namely the bread based recipes, or with flour, eggs or codfish associated with five herbs and spices plus vinegar (class 2), and those based upon broad beans or vegetables associated only with three herbs and spices plus sugar (class 3). The bouquet of herbs and spices associated with each class is also quite different, garlic being the sole herb common to two classes.

This does not seem consistent with the theory that spices are needed to preserve foods (e.g. Sherman and Billing 1999), except for the prominent position of class 1 recipes. In fact, in the past, when meat was present it could be necessary to prepare quantities larger than those that could be consumed immediately and the absence of refrigerating systems could explain the need of spices to preserve the prepared dishes.

According to the theory one should also expect that recipes of class 2 would be less flavoured than those of class 3 because the former, bread soups, bread based dishes and generally also eggs, once prepared were always to immediate use. Codfish, that is traditionally preserved as a dry salty item in the Portuguese culinary tradition, is as well prepared as needed. Conversely, class 3, characterized by broad beans and vegetables, in spite of the presence of durable pork products, involves a variety of ingredients, especially broad beans, difficult to preserve.

However, the number of herbs and spices characterizing class 2 is almost two times greater than the number that characterizes class 3. Thus it seems that taste and flavour, independently of the need of preservation, may play here an important role.

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