



Culinary Concept

The use of the sea fennel as a new spice-colorant
in culinary preparations

Massimiliano Renna*, Maria Gonnella

Institute of Sciences of Food Production, CNR—National Research Council of Italy, Via G. Amendola, 122/O – 70126 Bari, Italy

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Abstract

The sea fennel (*Crithmum maritimum* L.) is a wild plant from the same family of the parsley and celery, that is used as a fresh ingredient for many food preparations. In this work, some alternative culinary uses for this aromatic plant as a dried ingredient have been proposed. Therefore, two drying technologies were applied with the aim to obtain a new spice-colorant without chemical synthesis. The results are discussed in terms of visual quality, odor and taste of the dehydrated products. Moreover, the effects on the overall sensory properties of some dishes prepared using the two different types of this new spice are reported. The introduction of the dried sea fennel in gastronomy could increase the sensory appeal of some traditional dishes and support the creation of many new recipes.

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Keywords: Wild plant; *Crithmum maritimum* L.; Dried product; Overall sensory quality; Cuisine applications

Introduction

Simply wild plants or forgotten resources?

The Italian flora is very rich and account for over 50% of the 12,500 plant species found in Europe (Blasi et al., 2005). About 2500 wild species are recorded in Apulia region (Southern Italy) (Fig. 1) and over 500 among them may be consumed as food (Bianco et al., 2009). In the past our ancestors have usually gathered and eaten wild plants, but at the present also the most expert farmers know and utilize only few species. Fortunately, a recent interest on wild species is increasing both for the greater attention toward a healthy diet and for the higher needs to restore a link with nature and with old gastronomic traditions (Łuczaj et al., in press). In this context, the sea fennel (*Crithmum maritimum* L.) may be one of the most appealing ingredients with the aim to obtain new food products made from wild plant

of the Apulia region. The sea fennel is a facultative halophyte also known as crest marine, marine fennel, sampier and rock samphire (Fig. 2). This aromatic plant is from the same family (*Apiaceae*) of the parsley and celery but grows wild on maritime rocks, piers, breakwaters and sandy beaches along Mediterranean and Black sea coast, as well as along the Atlantic coast of Portugal, South and South-West England, Wales and Southern Ireland. It is traditionally used in many countries as edible vegetable with interesting sensory attributes. These attributes include a slightly salty taste and some notes of celery, followed from light notes of common fennel and peel of green citrus with a pungency aftertaste. Sea fennel has existing culinary uses in many European countries. The leaves are washed, cut into small pieces and prepared for salads that are served with a dressing of mixed juice and olive oil (Bianco et al., 2009). In British Isles as well as in Southern Italy the leaves are kept like capers in vinegar (Region of Puglia, 2010; Atia et al., 2011). The fresh leaves can also be used to prepare soups and sauces or seasoning especially for fish based dishes.

A possible functional food

Apart from the use as a gastronomic ingredient, the sea fennel has been largely used for nutritional and medicinal

*Corresponding author. Tel.: +39 080 5929306; fax: +39 080 5929374.

E-mail address: massimiliano.renna@ispa.cnr.it (M. Renna).

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Fig. 1. Map of Italy with highlighted Apulia region.



Fig. 2. Sea fennel in the wild.

purposes. It was consumed in the traditional diet of the first European farmers as a potent source of minerals, vitamin C and other bio molecules. *C. maritimum* L. is also used in folk medicine as appetizer, tonic, carminative and diuretic (Cornara et al., 2009). As reported by Cunsolo et al. (1993), the sea fennel was used by sailors during food preparation to protection against scurvy. In Italy, the infusion of shoots harvested before the fructification were used against inflammations of the urinary tract and prostate (Atia et al., 2011). Moreover, sea fennel shows tonic and purgative action while the infusion of leaves has been largely used for the digestive diseases and for renal therapy (Cunsolo et al., 1993; Guil-Guerrero and Rodriguez-Garcia, 1999). Some authors also reported that *C. maritimum* L. extract exhibited high phenol content, radical scavenging activity, and antimicrobial properties against a large panel of human pathogenic bacteria (Rossi et al., 2007;

Meot-Duros et al., 2008, 2010; Meot-Duros and Magné, 2009). Furthermore, the oils extracted from leaves contain high concentrations of fatty acids of the ω -3 and ω -6 series. These fatty acids notoriously play an important role in modulating human metabolism and show beneficial effects against coronary heart diseases (Guil-Guerrero and Rodriguez-Garcia, 1999). Moreover, sea fennel is rich in volatile compounds as sabinene, γ -terpinene, thymol methyl ether, dillapiol, α -pinen, p-cymol, apiole, *cis*- β -ocimene and terpinen-4-ol (Pateira et al., 1999); it also contains different water-soluble compounds as sugars, organic acids and many minerals (Atia et al., 2011).

Toward the gastronomic evolution of the sea fennel

Generally, the aromatic plants are used in gastronomy as a spice due to their aromas (i.e. thyme, sage, rosemary) and/or color (i.e. saffron, paprika), attributable to chemical compounds. In some cases, different parts of the aromatic plants are subjected to a drying process before the use (i.e. black pepper, cinnamon, nutmeg, oregano). Therefore, the food industry has developed a great market for the dried spices, proposed as a single ingredient or mixtures (i.e. curry powder, chili powder). On the other hand for some aromatic compounds also chemical synthesis is applied to produce them (i.e. vanillin). However, the natural products derived from plants show a greater appeal for consumers and chefs. As a consequence, the introduction of new spices and natural colorants from plants could stimulate new opportunities for gastronomy. Currently, there is no market demand for a dried spice made from sea fennel and there are no culinary experiences with this type of dried product. For these reasons and considering the interesting properties of the sea fennel, the aims of this study were: (i) to apply two different drying technologies for obtaining a spice, starting from fresh leaves of this plant; (ii) to evaluate the effects of these different technologies on the sensorial quality of the spice; and (iii) to assess some potential applications of this spice on different gastronomic preparations.

The more general goal was to create a new and appealing spice for potential users and also to favor the gastronomic experimentation through the use of an alternative and natural ingredient.

Material and methods

Material

The aerial part of the sea fennel (*C. maritimum* L.) was randomly collected from many plants along the shoreline in Monopoli (Bari, Italy). Then, the plant material was immediately transferred to the postharvest laboratory of the Institute of Sciences of Food Production – National Research Council of Italy – and was subsequently cleaned and separated into “edible” and “refuse portion” categories. The latter generally consisting in the older leaves and fibrous stems that are removed during normal food preparation. Edible leaves were mixed and stored at 4.0 ± 0.5 °C until the time of processing.

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