



# Traditional and alternative natural therapeutic products used in the treatment of respiratory tract infectious diseases in the eastern Catalan Pyrenees (Iberian Peninsula)



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## ABSTRACT

**Ethnopharmacological relevance:** Respiratory tract diseases, including mild troubles, such as the common cold, and also life-threatening ones such as bacterial pneumonia and lung cancer, are very important in terms of mortality, incidence, prevalence and costs. Classical medicine has undoubtedly addressed these illnesses, but the body of knowledge generated by alternative approaches, among which folk medicine plays an important role, is not at all negligible.

**Aims of the study:** In this context, we performed an ethnobotanical study in a Catalan region of the eastern Pyrenees, northeast Iberian Peninsula, in order to assess the popular knowledge on useful plants. We present here the data concerning pharmaceutical uses of plants devoted to respiratory illnesses.

**Methodology:** A total of 160 informants (94 women and 66 men, born between 1915 and 1988) were interviewed during 102 semi-structured interviews. Voucher specimens were collected, and then processed and deposited in the herbarium BCN.

**Results:** We collected information about 99 plant taxa (94 species – some of them with subspecies – of 85 genera belonging to 50 families) popularly employed to prevent or treat respiratory troubles. The degree of reliability of uses is high, as indicated for instance by an informant consensus factor of 0.83 and by high medicinal importance indexes for many taxa. In addition, we have recorded information on 14 animal and four mineral products also used against respiratory ailments, this constituting the first ethnopharmacological work in the Catalan linguistic area to report plant, animal and mineral remedies, and one of the very few in the Iberian Peninsula involving the study of ethnozoological medicines.

**Conclusions:** The data collected show a high degree of consistency and indicate a remarkable persistence of folk knowledge on plant uses. The antitarrhal, antitussive and for sore throat are the most valuable uses. This research could be the starting point for further research aiming to obtain products that may generalise the alternative medical uses here raised at a local level. Phytochemical and pharmacological studies on some of the plants quoted here – of which we could provide material to potentially interested researchers – would be useful first steps in this process.

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## 1. Introduction

“Respiratory tract diseases” is a medical term that encompasses pathological conditions affecting the air passages, including the nasal passages, the bronchi and the lungs. These health troubles range from acute infections, such as pneumonia and bronchitis, to chronic conditions such as asthma and chronic obstructive pulmonary disease (COPD) and include unspecific symptoms such

as dyspnea. The most common respiratory diseases are mild and self-limiting, such as the common cold, but some are life-threatening, like bacterial pneumonia, pulmonary embolism, and lung cancer. Respiratory diseases are second to cardiovascular conditions in terms of mortality, incidence, prevalence and costs. The biggest contributors to respiratory death in Europe are lung cancer, pneumonia and chronic obstructive pulmonary disease. Worldwide, hundreds of millions of people suffer every day from chronic respiratory ill-health. According to WHO global estimates, 300 million people suffer asthma, 210 million people have COPD, while millions more show allergic rhinitis and other, often under-diagnosed, chronic respiratory conditions (European Respiratory Society, 2010).

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In this study, we focused on the infectious diseases, but have also collected data for all the respiratory illnesses. Pneumonia is an inflammation of the lungs caused by an infection by bacteria, viruses or fungi, and producing fever, cough and breathing difficulties (Casassas, 1990). Usually, a physical examination can determine if a patient has pneumonia, which is relatively frequent. The annual incidence rate is 6/1000 in the 18–39 age group and this rises to 34/1000 in people aged 75 years and over (Hoare and Lim, 2006). Nowadays, antibiotic agents constitute the common treatment for bacterial pneumonia, but in the last two centuries, especially before the use of antibiotics, several remedies were used to treat pneumonias and related disorders. Other diseases commonly treated with traditional remedies are asthma, bronchitis and unspecific symptoms such as breathlessness (dyspnea). In the recent past, the non-serious respiratory troubles such as common colds, influenza or sore throat, among others, were usually treated with remedies mostly based on plants while, when the pneumonia or pleuritis symptoms were recognised, a specialist was needed and more complicated and strange therapies were used in our geographical area. Nowadays, alternative medicine is only used in common respiratory infectious diseases, and the more severe ailments are treated in hospital.

Phytotherapy has always provided efficient remedies for chronic and moderate health troubles and sometimes for acute and severe disorders (see, among others, Shoskes, 2002; Santos-Neto et al., 2006; Sureshkumar, 2012). Ethnobotany and ethnopharmacology have proved themselves as relevant approaches to establish folk medicinal knowledge in the different territories or ethnic groups, this being useful in drug design and discovery (Heinrich and Gibbons, 2001; Lewis, 2003). The above-mentioned ethnopharmacological work deals with a high number of popularly-employed medicinal plants, and highlights uses that can constitute good complements to conventional or allopathic medicine and their palliative properties.

Respiratory disorders constitute the second group in order of importance mentioned by the informants in previous studies carried out in the Iberian Peninsula and other Mediterranean regions (Rigat et al., 2006, 2007; Parada et al., 2009, and references therein). The most common remedies include plants with several administration forms (aerosols, cigarettes, poultices, smokes, tisanes, etc.) but other recipes involve animal and mineral products as well (Bonet and Vallès, 2006; Rigat et al., 2006; Parada, 2007; Vallès, 2007; Agelet, 2008). In addition, some of these recipes involve oils and ointments, which were elaborated and sold elsewhere in the Pyrenees by the women called “trementinaires”, a Catalan name coming from “trementina”, turpentine (Frigolé, 2007). Some of these remedies, oddly enough, have been used for years and should have some scientific basis worth investigating, while others could be included within the category of ritual.

Taking into account the incidence of respiratory ailments and the vigour of folk knowledge on plant uses in the Catalan Pyrenees,

the objective of this work is to know and understand the plants and other remedies used in the treatment of such diseases by people inhabiting the eastern part of the mentioned area, complemented with data contained in some available historical documents from the same territory (provided by an informant) and to contribute towards possible new drugs and preparations from natural sources.

## 2. Material and methods

### 2.1. Studied area

The studied area is the district (“comarca” in Catalan, the informants’ language) of Ripollès, situated in the eastern Pyrenees (Catalonia, Iberian Peninsula), and comprises three valleys: the river Ter valley, the river Freser valley and the Baix Ripollès (Fig. 1). The Northern part belonging to the axial Pyrenees has several peaks of almost 3000 m. Concordantly with this, the weather is typical of high mountain areas, with cold winters (mean temperature around 10.6 °C) and a mean annual precipitation of 1487.2 mm (data corresponding to 2011, [www.idescat.cat](http://www.idescat.cat)), although softened by the proximity of the Mediterranean Sea. Landscape is basically alpine and subalpine (Vigo, 2010). Ripollès district comprises 956.24 km<sup>2</sup> and 26821 inhabitants distributed in 19 municipalities, some of which have suffered an important population decrease, though partly compensated in recent years by tourism and second residences. A high percentage of the population inhabits small villages and isolated houses. Agriculture is not a relevant economical issue, given its climatic conditions and uneven territory, but many farms and houses within the villages have their own homegardens for private consumption. In the past, conventional medicine was not easily accessible for these people, and the use of plants or other natural resources was necessary in order to survive in the extreme conditions. Nowadays, official health care service reaches everybody in the region, but traditional practices seem to remain active to some extent.

Respiratory ailments used to have a high incidence in the studied area. In one of its three valleys (high river Ter valley), data from the period 1900–1924 (Sau, 1928) show 895 cases of death due to these ailments (influenza 48, diphtheria and croup 79, pulmonary tuberculosis 129, acute and chronic bronchitis 167, pneumonia 472) in a population of 5786, this being, together with heart diseases, the main cause of mortality. This high incidence leads us to suppose a considerable body of acquired knowledge among these people in order to combat such illnesses.

### 2.2. Interviews

We used semi-structured interviews (Pujadas et al., 2004) as a tool for obtaining information from our participants, avoiding too-

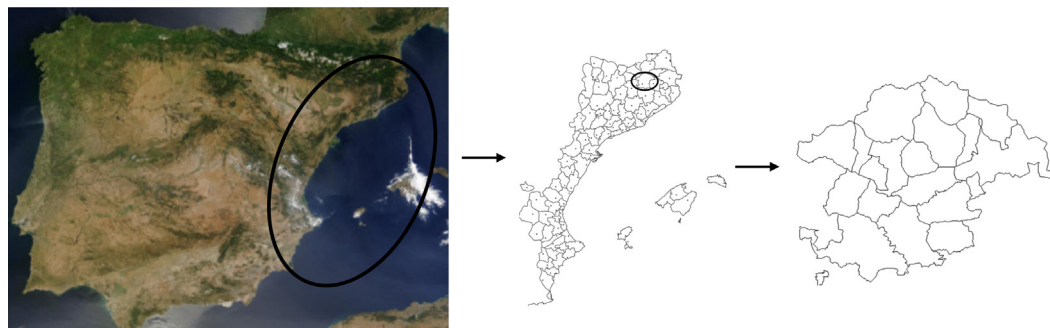


Fig. 1. The territory studied, showing its municipalities, in the context of the Iberian Peninsula and the territories where the Catalan language is spoken.

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