

Ethno Botanic Study of *Chamaerops humilis* L. Var. *argentea* Andre (Arecaceae) in Western Algeria

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Abstract: *Chamaerops humilis* is a flagship species in the Mediterranean circum. It plays an important role in the Algerian ecosystems. Now, this species is used in traditional medicine in the west of Algeria. The ethno botanical surveys conducted on the ground show the use of this plant in the different districts over the region of Tlemcen (Western Algeria). Thus, some ailments could be treated by different parts of this taxon. The statistical analysis of the technical data made in the context of this study indicates the populations who use this species most. In phytochemical terms, the extraction of active substances by the screening method reveals the chemical composition of leaves, spadicea and cabbage palm.

Keys words: *Chamaerops humilis*, region of Tlemcen, ethno botanic, phytochemical study, leave, spadicea, cabbage palm

INTRODUCTION

Traditional treatments for both cultural and economic reasons are now widely used. Many species are used by traditional-practitioners in the Tlemcen region (Western Algeria). The diseases targeted by the users are varied and go from the simple digestive disorders to the treatment of chronic diseases such as cancer, ulcer, diabetes, kidney stones (Larousse, 2001; Beloued, 2001; Diallo *et al.*, 2004; Passalacqua *et al.*, 2006; Dellil, 2007; Squalli *et al.*, 2007; Rammal *et al.*, 2009). In social terms, modern medicine seems to be quite costly therefore, many people are treated by medicinal plants. These play a significant role in curing many diseases. The socio-economic and cultural context has a heavy influence on the patients in the region and on the conduct to follow against the disease. The medicinal plants in the region of Tlemcen are very coveted.

They are used according to the chemical groups such as: anti-oedematous, antiseptic, antibacterial, anti-inflammatory, antispasmodic, healing, sedative, analgesic, hypotensive. *Chamaerops humilis* L. var. *argentea* Andre, a very widespread species in the Western mediterranean region (Negre, 1951; Cuenod, 1954;

Maire, 1957; Quezel and Santa, 1962; Deysson, 1979) presents some pharmaceutical properties (Halimi, 1997; Bnouham *et al.*, 2002).

It is to identify the ethno botanic impact of the plant that an investigation has been conducted in many districts in the region of Tlemcen. It was followed up by a phytochemical study. The statistical study shows the role of this taxon in people's daily life.

The variety of species: The literature on the number of the genus *Chamaerops* species in the Mediterranean and especially in the study area, leads us to distinguish a single species: *humilis* (Negre, 1951; Cuenod, 1954; Maire, 1957; Quezel and Santa, 1962). However, the number of varieties is variable according to the researchers. Quezel and Santa (1962) distinguish no variety while Maire (1957) found 4 varieties in North Africa.

They are the typica variety, characterized by green and shiny leaves, the inermis variety, characterized by inerme petioles (without needles), the argentea variety, characterized by silver dull blue sheets, the mitis variety. It is the *argentea* variety that colonizes the natural areas in the region.

Systematic *Chamaerops humilis*:

Phylum: Spermatophytes
 Sub Phylum: Angiospermae
 Class: Monocotyledonae
 Order: Spadiciflores
 Family: Arecaceae
 Sub family: Coryphoideae
 Tribe: Corypheae
 Sub Tribe: Thrinacinae
 Genus: *Chamaerops*
 Species: *humilis*
 Variety: *argentea*

Several vernacular names are assigned to this species, we can name them as:

Saw palmetto: A term that is taken from the scientific definition of this species.

Mediterranean palm: This species grows in the spontaneous state in some countries around the Mediterranean.

Palm spectrum: The leaf of the palm has a fan shape therefore, its name. In North Africa and particularly in Algeria, the usual designation is the doum.

MATERIALS AND METHODS

Study area: The study was conducted in five districts in the region of Tlemcen: Djebala, Fillaoucène, Honaine, Oued Chouly (currently Oued Lakhdar) and Azails. The five districts cover an area of 495.61 km² with about 35127 inhabitants in 2002 (Fig. 1). From a geographical point of view, the districts are located, respectively in the mountains of Trara (3 districts) and the mounts of Tlemcen (2 districts). As for the flora, the main species that form the vegetation cover in the region are: *Quercus suber*, *Quercus ilex*, *Quercus faginea* ssp. *tlemcenensis*, *Quercus coccifera*, *Pinus halepensis* to forests and *Juniperus oxycedrus*, *Chamaerops humilis*, *Calycotome villosa* sp. *intermedia*, *Calycotome spinosa*, *Ziziphus lotus*, *Withania frutescens*, *Rhamnus alaternus*, *Arbutus unedo*, *Asparagus stipularis*, *Asparagus albus* *Asparagus acutifolius* for the pre-forest and matorral. This vegetation grows on chalky or siliceous soils.

Nature of the study: This is a qualitative cross-sectional study conducted in three stages: the first stage lasted from March to October 2006 and 2007 for the ethno botanical survey which was followed by data processing (processing of data sheets and statistical analysis). In the second step, we collected *Chamaerops humilis* feet and prepared the parts to consider (drying and milling). The third step was a phytochemical study in the laboratory.

Data collection

The ethno botanical survey: In order to gain the confidence of the people who were targeted by the ethno botanic investigation and to ensure the reliability of the collected information, a ground preparation was necessary. For this purpose, we had meetings and discussions with the inhabitants of the districts as well as with traditional-practitioners of the region. For the ethno botanical survey, a data sheet (model) was sent to various people who could give us reliable information. The targeted people have over 30 years. We considered that this group of individuals could provide us with accurate information.

Model of data sheet:

N°: ...
 Approximate age: ...
 Place of residence: ...

Parts of the plant used	What cases do you use that part of the plant	Preparation technique	Dosage
Leaves			
Cabbage-palm			
Spadicea			
Roots			

All the data concerning the parts used in this species are carefully noted.

Picking *Chamaerops humilis* feet: *Chamaerops humilis* has roots that can go up to 3 meters deep (Hasnaoui, 2008), a stipe of an average size between 50 and 150 cm, bearing the spadicea and a crown of leaves. To get the parts to treat, we had to cut a number of feet.

An average height of 50 cm was chosen. The stipe of *Chamaerops humilis* is surrounded by brown fiber that is rich in tannin. In the case, we removed the fibers until the young spadicea and cabbage-palm appear; those are the edible parts of the dwarf palm. The moment the feet were picked, date, location and soil type were identified. The used plant parts were cut into small pieces and dried in the open and in shade for 3 weeks. A code was assigned to each part of the sample.

The phytochemical analysis: The different phytochemical analysis was carried out in the laboratory of phytochemistry in Abu Bakr Belkaid University of

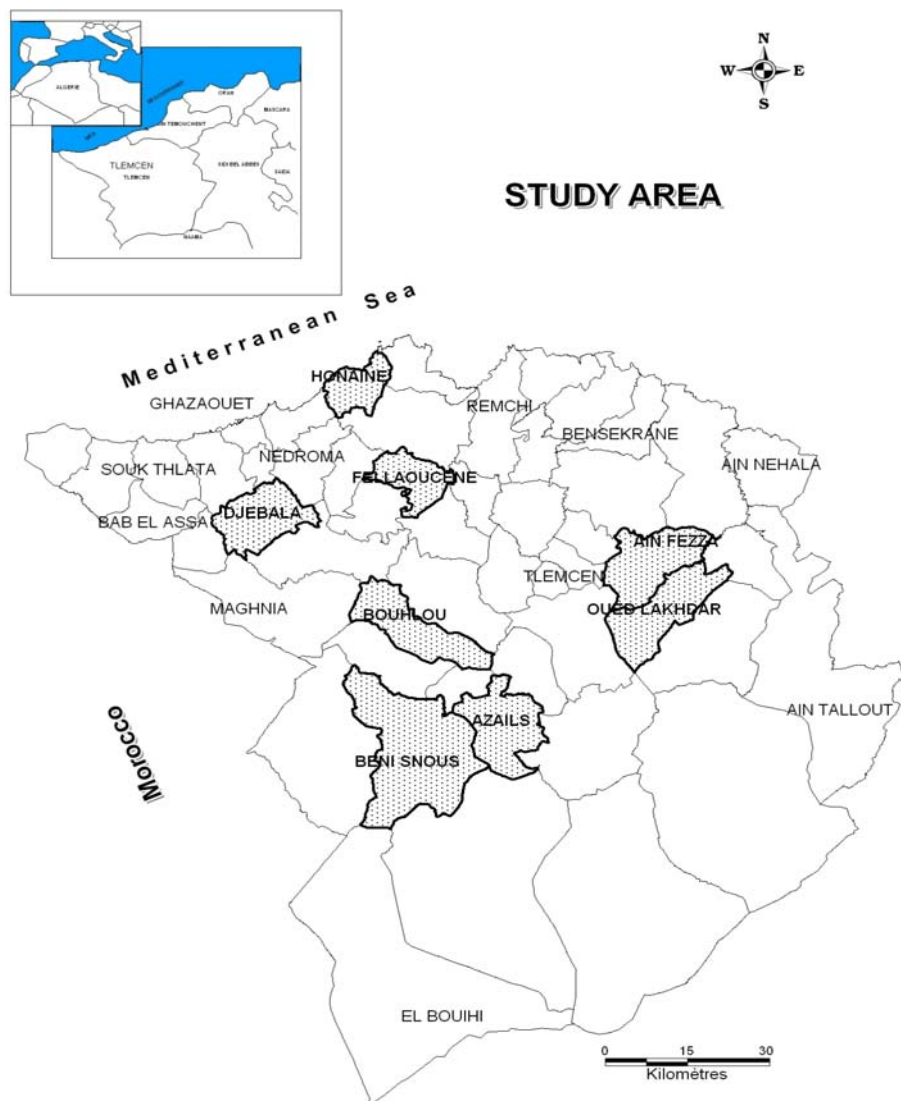


Fig. 1: Location map of the study area

Tlemcen by phytochemical screening. This is a qualitative analysis that is based on color reactions and/or extraction using the methodology described in the literature (Bekkara *et al.*, 1998; Bruneton, 1999; Squalli *et al.*, 2007; Yemoa *et al.*, 2008). It is performed on the parts of the dried plant.

RESULTS AND DISCUSSION

Ethno botanical analysis: About 747 surveys in all were completed with the distribution shown in Table 1. Figure 2 shows of the obtained histogram results. From the results of the survey analysis, it was concluded that different diseases are treated by the active substances

Table 1: Distribution of the data by sex and proximity

Parameters	Population		Total
	Urban population	Local population (villages-hamlets)	
Men	137	305	442
Women	74	231	305
Total	211	536	747

contained in the parts of the studied plant. According to the survey, the therapeutic properties of *Chamaerops humilis* are generally for internal use and are as follows:

- Hypoglycemic (anti-diabetes)
- Antispasmodic
- Bloating

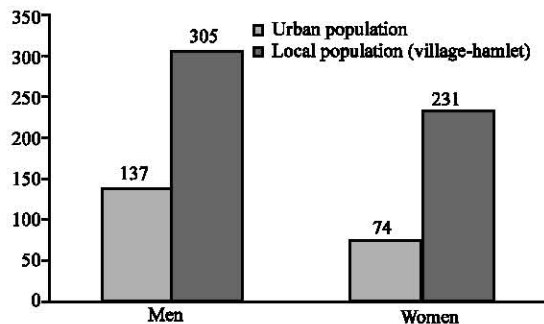


Fig. 2: Distribution of the data by sex and proximity

Table 2: Method of use of the different plant parts and the treated diseases

Parts used	Diseases /illnesses	No. of users	Preparation	Dosage
Leaves	Diabetes	42	Maceration 12-24 h	½ - 1 glass day ⁻¹
Cabbage-palm	Bloating	619	Remove the fibers	During meals
	Gastric pain	551	of. the terminal bud.	unlimited
	Constipation	116	It is eaten raw in salad	
Spadicea	Gastric pain	514	Remove the fibers of.	During meals,
	Toning	15	the Spadicea It is eaten raw in salad	unlimited

- Stomach pain
- Constipation
- Toning

Table 2 shows the various treated illnesses and diseases, the number of users, the preparation method and the dosage. The analysis of Table 2 shows the used parts of the plant, the treated diseases, the method of preparation and the dosage. We clearly notice that the method of preparation depends on the part of the plant that is used in the different treatments. Only the leaves are used by maceration and few people use them to treat diabetes.

However, cabbage palm and spadicea are used raw without any preparation beforehand. Their fibers are removed and they are consumed outside or during meals. In statistical terms, the number of people who use these two parts to treat gastric pains represents the majority, 73.76% of the total number use cabbage palm, 56.26% of whom are men.

About 68.80% of the respondents use spadicea for the same treatment, 53.30% of them are men. As for bloating, only cabbage palm is used for this treatment; 82.86% of the total number among whom, 62.85% are men. About 15.52% of the total number of respondents use the same part of the plant for the treatment of constipation, 62.07% of them are women. The number of people using spadicea as a tonic is small; only 2% of the total number of which the majority of whom are women (80%). Finally, the respondents did not mention the use of the fruits of

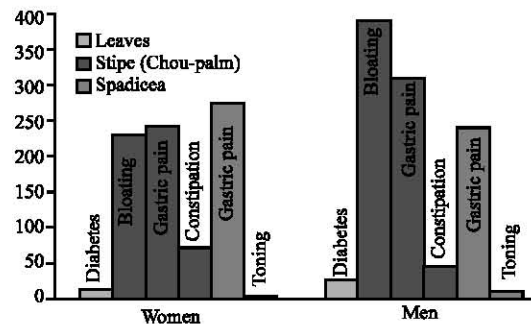


Fig. 3: Diseases and illnesses treated by the different parts of the species by sex

Table 3: Phytochemical composition of the different parts of *Chamaerops humilis* L. var. *argentea* Andre

Phytochemical composition	Cabbage palm	Spadicea	Leaves
Saponosides	+(1, 5)	+(2)	+(2, 5)
Tannins	+	+	+
Alkaloids	-	-	-
Steroids	+	+	+
Unsaturated sterols and terpenes	+	+	+
Flavonoids	+	+	+
Free flavonoids	+	+	+
Heteroside flavonoids	+	+	+
Glycosidic flavonoids	+	+	+

the same plant, although recent studies show the usefulness of this part in the treatment of diabetes in Morocco (Bnouham *et al.*, 2002).

Figure 3 shows the diseases that are treated by the different parts of the species by sex. We note that globally, men use this plant far more than women to treat bloating, stomach aches, diabetes and to use it as a tonic.

Phytochemical analysis: Table 3 shows the different chemical groups sought in the different parts of the plant. The sign (+) reflects the presence of the chemical compounds group while the sign (-) indicates its absence. Table 3 shows the presence of the following chemical groups: saponosides, tannins, alkaloids, flavonoids, free flavonoids, heteroside flavonoids, glycosidic flavonoids, steroids, unsaturated sterols and terpenes.

The presence of these compounds groups indicates the medicinal use of *Chamaerops humilis* L. var. *argentea* Andre. Some flavonoids are anti-inflammatory (Bidet *et al.*, 1987) antiviral, anti-tumor, hypotensive and diuretic (Bruneton, 1999) and anti-carcinogenic (Marfak, 2003).

In addition, flavonoids can inhibit atherosclerosis and therefore, reduce the risk of cardiovascular diseases (Marfak, 2003).

On the contrary, most of the biological properties of tannins are associated with the power they have to form

complexes, particularly with proteins. They also increase the capillary resistance and reduce its permeability, increase venous tone and the stabilization of collagen (Bruneton, 1999). Tannins make tissues more flexible, drain excessive secretions and repair damaged tissues (Larousse, 2001). These compounds can tan the skin and create the sensation of astringency (Nahrstedt and Butterwick, 1997).

An absence of alkaloids in all the analyzed parts is noted. These substances act on the nervous system and cause disruptions and paralyze the Cardiac parasympathetic system that controls the activities of the body (Larousse, 2001). The plant presents therefore no risk of toxicity.

As for saponosides their presence is important in all the studied parts. They are more frequent in the leaves (MI = 2.5) than in the consumable parts: Cabbage palm Spadicea and with an index of foam (IM), respectively 1.5 and 2.

CONCLUSION

The study presented in this document is an ethno botanical study of a medicinal plant in the Tlemcen region (Western Algeria). This study is based on an ethno botanical survey and a phytochemical analysis. This is to clarify the benefits, effects and medicinal uses of *Chamaerops humilis* L. var. *argentea* Andre. The survey shows that the local populations (villages, hamlets) use this plant more than those in the main towns. The results of the phytochemical analysis showed the main chemical groups of this species. The medicinal and nutraceutical role of this species should be clarified by further studies on the antibacterial and antifungal activity. The analysis of the chemical composition of the essential oils in this taxon will be the object of further study.

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