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Original Research Article

Evaluation of Medicinal Plants Used for the Treatment of Urinary Stones

Ahmed Bendjilali*

Department of Plant Physiology, College of Biology, Institute of Natural Sciences, University of Oran, Algeria

**Corresponding author.*

Abstract

A survey was conducted in an area of Relizane, town located in west of Algeria known by the presence and proliferation of medical plants which are widely used. Result obtained showed that 76% use the medicinal plants for therapeutic purposes; while 60% have an acceptable skill level, 21% have a high educational level. Regarding the way of use, results showed 50% prefer weeds, same rate prefer cultivated ones. No difference has been highlighted between them A percentage of 62 use the leaves as a major part of the plants, 45% other parts. It was also noted that 45% of the plants are used for the digestive system, 35% for respiratory diseases, the rest for various diseases. The use of the plants are not subjected to scientific or methodological ways but submitted to coincidence, also the selection of plant parts or active substances are not considered objectively by users. To test this kind of treatment a monitoring has been done regarding the accumulation of stones in the urinary. Following herbalists advice, the herbal tea was made of a mixture of nine plants, sheet (*Ammi visnaga*, *Thymus vulgaris*, *Juneperus communis* L., *Mentha pulegium* L., *Foeniculum vulgare*-seed, *Linum usitatissimum*, *Myrtus communis* L.-leaves and *Rosmarinus officinalis*. The group of persons suffering from renal calculus was submitted to this tea; the results demonstrate positive effect by the reduction of the calculus volume by about 77%; calculus types were whewellite, weddellite and carbapatite. The evaluation of the proportion of urea, creatinine and uric acid in the blood was found normal before and during treatment; this indicates the proper operation of renal system.

Keywords

Biomass

Ecosystem

Medicinal plants

Valorization

Wheddellite

Whewellite

Introduction

The known alternative medicine include all therapeutic methods which does not use narcotics and medicaments in the treatment of diseases (Abdelaal, 2007), chance drove a major role in the discovery of many herbs and plants which treat diseases (Royha, 1973) as medicaments of plant origin used in medical treatments (Laarej, 2003). By today chronic diseases treated by numerous medicaments often lead to disappearing of illness symptoms only (Sayed and Hussein, 2004). The majority of the used curative plants do not show the side symptoms or undesirable effects (Dahouët, 1993). Relizane at the west of

Algeria, show a big interest on Herbal medicine. The number of academic research introduced in this domain is more than 16000 - year 2007 (Chinour, 2009). The function of the kidney is to clean the body from toxins and deposits of the metabolism of food gathered by blood from cells; urine is formed in the kidney by néphrons who filter the undesirable elements in the blood. The final results of the metabolism are represented by products as urea, créatine and uric acid. Volume of the refinery is 130 ml/J, 1,44 l/24 containing 900 g/l some water, 20g of mineral breaking down elements,30g of organic compounds (Abouzeid, 1991).

The renal calculus are not subject to formation and development in non-diseased persons because of equilibrium of the characteristics incentive and dissuasive urogenital measures between catalysts and inhibitors of synthesis *(lithogenèse)*. Calculus is formed towards the pip which happens at this equilibrium by the increase *(inductive)*, or decrease *(inhibitors)*, (Zerouni, 1991). The scientific studies are ongoing in order to find active substances in medicals plants, or forest plants; known as green medicine.

Materials and methods

Questionnaire: a series of questions, which included 485 citizens Relizane mountainous region of western Algeria, known by Western herbal medicine; and the great demand of medicinal herbs.

Plants utilization: Following the advice herbalists used was a mixture of nine (9) medicinal plants 15g each, sheet *(Ammi visnaga, Thymus vulgaris, Juneperus communis* L., *Mentha pulegium* L., *Foeniculum vulgare*), seed (*Linum usitatissinum, Myrtus communis* L. and *leaves (Rosmarinus officinalis).* A spoon of the ground and purified mixures in 150 ml hot water under controlled temperature was adopted for preparing tea and given three times daily to the patients.

Samples of patients: selected patients numbering 157, who were suffering from urinary disease and represented by the different type of kidney stone

Urinary analyses: Detection of urea was done according to reaction of Berthelot, the creatin by reaction of Jaffé and the uric acid by colorimetric test (Uricase-PAP) (Barham and Tinder, 1972; Fossati and Principle, 1982) while for the examination of renal kidney stones was done by X-ray and infra-red analyses.

Results and discussion

Survey regarding the users

The purpose of the use of medicinal herbs: According to the survey the majority of the users, use these plants for medicine purposes and some of them as spices or flavors ones (Fig. 1).

Educational level of the users: It was noted that most of the users of medicinal plants have an acceptable educational level while less percentage have a high educational one (Fig. 2).

Methods to choose plants: There are disparities in the use of certain parts of the plant, 35.6% of dry plants and 40.9% fertile ones and 21.43% without distinction; on the other hand more than 50% use wild plants and a low percentage the cultivated ones and there was no big proportion of use of a particular section (Fig. 3).

Various diseases treated by plants: Various diseases are treated with plants notably the common ones such as respiratory and digestive diseases (Fig. 4).

Use of temper healing plants

Urinary analyses: According to the figures mentioned in the applied section, it leads to the conclusion that the tempered plants have no effect on the kidney function (Table 1).

Table 1. Results of urinay analyses before and after using the tempering medicinal plants.

Analyses		Creatine	Urea	Uric acid
Male	Before	1.56± 10.52	0.30 ± 0.2	10.27 ± 48.1
	After	1.34 ± 9.9	0.05± 0.28	10.5 ± 52.12
Female	Before	2.12 ± 10.4	0.21 ± 0.40	11.44 ± 43.26
	After	1.11 ± 9.5	0.04 ± 0.22	10.17 ± 38.9

Fig. 1: The use of plants for various purposes.

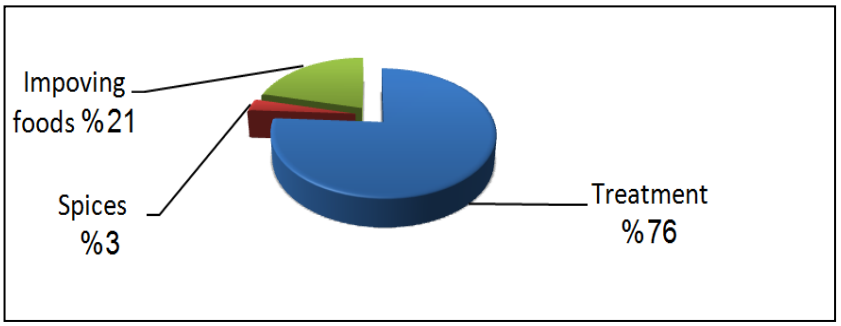


Fig. 2: The educational level of users.

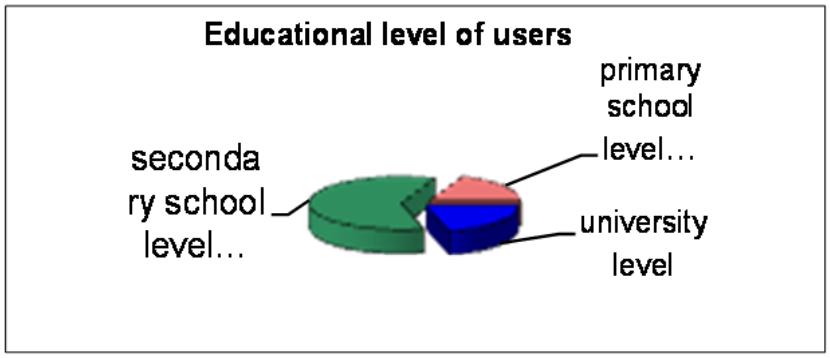


Fig. 3: The various parts of the plants used by the people.

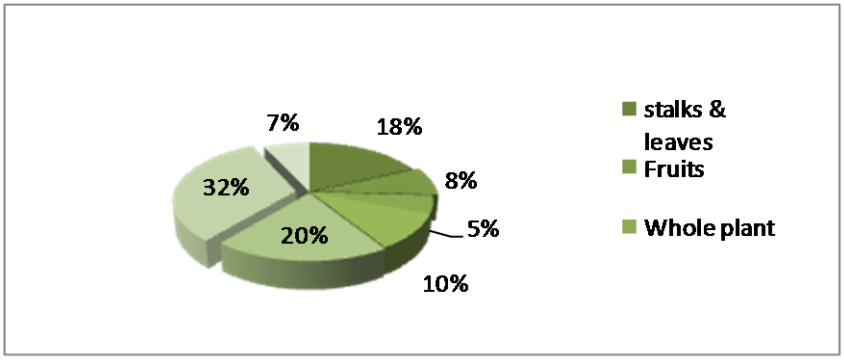
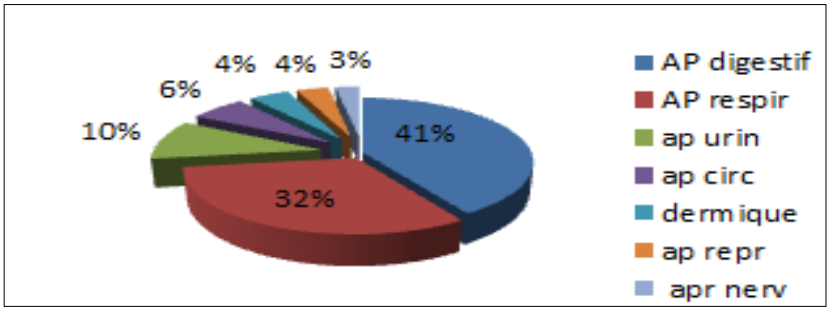


Fig. 4: Different ailments for which the plants are used.



Effect of the tempering on kidney stones: It was concluded that the tempering has a big impact on the stones by reducing their dimensions or by their total destruction comparing to the shape before tempering;

the stones have been rejected in powder form, with regard to the size before using the tempered plants.

The examination of the calculus demonstrated the crystals of oxalate of calcium in abundance in the majority of the patients. The presence of oxalate in the urine of the patients' samples was evident after the use of the tempering medicinal plant.

Morphological characteristics of kidney stones

The results of this study allowed us of identify the morphological characteristics, the form, the dimensions, the color, and hardness, with reference to the discoveries of researchers Daudon and Reveillaut in 1987.

Infrared application

According to the results it was noticed that the calculus are type of whewelite (oxalate of calcium monohydrate) and weddellite (oxalate of calcium dehydrate) (Table 2).

X Ray application

Any crystal of urinary apparatus which produce powder lean to deviation of the X-rays (Table 3).

Table 2. Results stones analyses by IR.

	Whewellite $Ca(C2O4)•(H2O)$	Weddellite $Ca(C2O4)•2(H2O)$	Carbapatite $Ca_5(PO_4)_3(OH,Cl,F)$.
Nawlaf	+	+	+
Naw ben	-	+	+
Nawlsef	-	+	+
Naw bar	+	+	+

Table 3. Results stones analyses by X-ray.

Grils number	Principal constituants	
	We/ Wh	Wh/ We
1	-	1/6
2	*Whewellite100% - trace Weddellite*	
3	-	1/5
4	*1/3*	
5	-	1/9
6	*1/2*	*1/4*
7	*Mélangede (We+Wh) wrong crystallized*	
8	*Mélangede (We+Wh) wrong crystallized*	

At least 500 medical plants used by the population are known in the medical care, including approximately 100 medical grasses found among the herbalists and exposed at the weekly markets and the herbalists stores, in particular in the rural areas (Halimi, 1997). The survey undertaken in this zone, indicates that 76% of the plants used in the care, are flavor and spice. The return back of the therapists towards the plant (phytotherapy) is obvious compared to the expensive chemical treatment and it's negative complications for the health. The results show that 60% of the users have an acceptable educational level and 21% have a high educational one which explains the interest of the educated class of the benefits to take care after by the plant. It was noted also that more than 50% of the users prefer the type of wild plants, and less than 50% the cultivated ones. This fact may explain the no scientific process regarding the use of these plants; this thought is confirmed by the conviction of many users that the wild grasses are rich in materials and active matters in force and that nature gives more effective products. Following this survey, the most parts used of the plants are the leaves 32% as an important element. This kind of treatment is applied in common diseases such as the digestive tract (45%), respiratory (35%). It was based mainly based on the experience and coincidence. Research on the field showed that through 280 plants species employed in the Maghreb as a whole, including Algeria, people are using them for therapeutic, nutritional or cosmetic purposes in different forms, as dried herbs, or spices, while the supply of most of them is provided mainly by the herbalists (83.4%), by druggists (14.4%), and pharmacists (2.2%). Tests of our research related to

kidney stones treated by plants was based on a sample of 157 patients impacted by accumulation of urogenital calculus , the analysis of the proportion of urea creatine and the uric acid levels in the blood appeared normal before and during treatment with the tisane composed of nine (9) medical herbs where it has been detected the evidence of the medical therapeutic effect on kidney disease. This treatment based on herbal treatment gave good results on the disappearance of the calculus by their disintegration at a rate of 40-76% in the early stages, and showed the appearance of sand layers formed in the collected urine samples of concerned patients. This phenomena was accompanied by the disappearance of the renal colic pain and/or reduction of the severity of the effect under the influence of some plants by painkiller. This was confirmed by some researchers, such as Mahmoudi (1990) and Dahouët (1993).

Calculus analysis by the rays infra-red and X-rays showed that the calculus are of type whewelite (of oxalate calcium monohydrate), followed by weddellite (of oxalate calcium di hydrated), confirmed by the experiments conducted on mice (Magharbi 2001). Medicinal plants enclose several active substances as thymol, khellin, visnagin, ammiol, visamiol, comarine, pinene, geraniol and boraniol that are used to lift and enable the work of the organs of the body effectively as gastrointestinal tract, respiratory and urinary (Sayed and Hussein, 2004). This research shows that these plants can be used for the treatment of severe kidney diseases such as the presence of renal calculus monohydrate calcium oxalate type, the more generalized.

Conclusion and perspectives

There is a great interest for the use of medicinal plants, but the lack of the scientific method is obvious; the necessity to create a database is to be imposed; such data base should include not at least types of the plants used for various diseases. The real value of active medical substances should be recognized; establishment of advantages and disadvantages of such plants should be clearly stated mainly for those of a common use by the dedicated academies and research centers. Build an inventory of medicinal plants to become an important source for the preparation of these medicines and the associated terminology. It has been noted that *Ammi visnaga, Thymus vulgaris, Juneperus communis* L., *Mentha pulegium* L., *Foeniculum vulgare, Linum usitatissinum, Myrtus communis, Rosmarinus officinalis* L., and *Coriandrum sativum* L. plants have an obviously well known medical effect. It has been concluded during these tests a disappearance of the renal colic pain with the increase in urinary excretion when treating with the above mentioned plants. Calculus was removed as sand from concerned patient's bodies. Calculus dimensions were reduced and in many cases totally disintegrated; it was then found as a powder in the urinary tract. The most important types of calculus put in evidence, after analyses, by the said treatment with commonly used medicinal plants are: whewellite -oxalate mono calcium [Ca (C2O4) • (H2O)], weddellite -oxalate calcium bilateral [Ca (C2O4) • (H2O)], Phosphate of calcium apatite Ca5 (PO4) 3 (OH, Cl, F). -Struvite. (NH4MgPO4 • 6H2O).

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