



Ethnobotanical study on the Bereztem Plant (*Aristolochia longa*) used in the treatment of some diseases in the cities of Rabat, Sale and Temara (Morocco)

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Abstract

An ethnobotanical study was conducted in the cities of Rabat, Sale and Temara. It was developed for identification of the plant *Aristolochia longa* Named locally *Bereztem* and traditional therapeutic use practiced by this population. From 176 question cards, we collected some information and be able to document this knowledge. The results of this study give a general overview of the profile of the users of this herb and the healing power of this plant. Analysis of the results obtained from the questionnaires record showed that the underground part is the most used part. The majority of remedies are prepared in powder form which is mixed with honey. Of all the diseases treated, cancer diseases are the most mentioned diseases. All this information is an important step for future research aimed to determine the exact dose needed to achieve the desired result for the treatment of cancer.

1. Introduction

Since ancient times, plants have been used in the treatment of diseases. There is increasing in the health and wellness benefits of herbs. According to the World Health Organization [1], more than 80% of the world's population relies on traditional medicinal for their primary healthcare needs. Active compounds produced during secondary metabolism are usually responsible for the biological properties [2]. Approximately 60% of drugs currently used for cancer treatment have been isolated from natural products ; taxol, vincristine and vinblastine isolated from *Taxus sp.* and *Catharanthus roseus*. Furthermore, more than 1200 plant species have been found to exhibit antidiabetic properties [3]. From the last years, we have focused on an intensive pharmacological analysis of medicinal plants, especially anti-diabetic plants used in traditional phytotherapy in order to discover new potential and natural remedies susceptible to enrich the therapeutic arsenal of diabetes. For High blood pressure or hypertension, attention has been recently focused towards herbal preparations which are traditionally used as potential therapeutic agents in the prevention and management of hypertension and cardio-vascular system [4, 5]. For diuretic activity, a vast number of plants are receiving more attention in ethnomedicine as diuretic agents. Because of this strong dependence on plants as medicines, it is important to study their safety and efficacy [6].

Morocco has an enormous unexplored potential of medicinal plants that are used in traditional medicine [7]. The heterogeneous ecologic conditions have favoured the proliferation of a diverse group of plant [8]. About 4560 species and subspecies of vascular plants are reported as spontaneous in the Moroccan flora [6, 9].

In the last decades, some institutions of higher learning have shown great interest in medicinal plants found in several regions of Morocco in the field of ethnopharmacology [6, 10]. However, few plants have been scientifically studied for the assessment of their quality, safety and efficacy against diseases [11, 12].

The aim of this paper was to review the therapeutic research undertaken on Moroccan medicinal plant ethnobotanical study is conducted on the Bereztem plant (*Aristolochia longa*) used in the treatment of urolithiasis in the cities Rabat, Sale and Temara (Morocco). Data are reported on its pharmacological activity and it also describes the methodology used.

2. Ethnopharmacological survey

The ethnobotanical study of the traditional medicinal plant *Aristolochia longa* used was conducted in Moroccan cities : Rabat, Sale and Temara, during two excursions in 2014 and 2015. The investigation was conducted by tested questionnaire. There were 176 informants. The data sought from the questions included socioeconomic information about the informants, such as age, sex, education level, locality, income and level of knowledge on the use of *Aristolochia longa* for medicinal purposes (modes of preparation and plant parts used). We based on a (annex 1) pre-established survey administered orally. Some time, the answers were difficult to disclose by our interlocutor. Before going out into the field to conduct the ethnobotanical study proper, we have located the different survey point's shown below in the study area. For the city of Rabat, we were able to visit 22 places in different localities for the 3 cities (Figure 1). After gathering all the information, computer processing was necessary. To process and analyze the results, we used the SPSS software version 20 (Statistical Package for Social Sciences) which allowed us to perform a set of operations in a short time. The Morocco's Practical Flora of Fennane et al. [13] was used to complement the information gathered in the field.

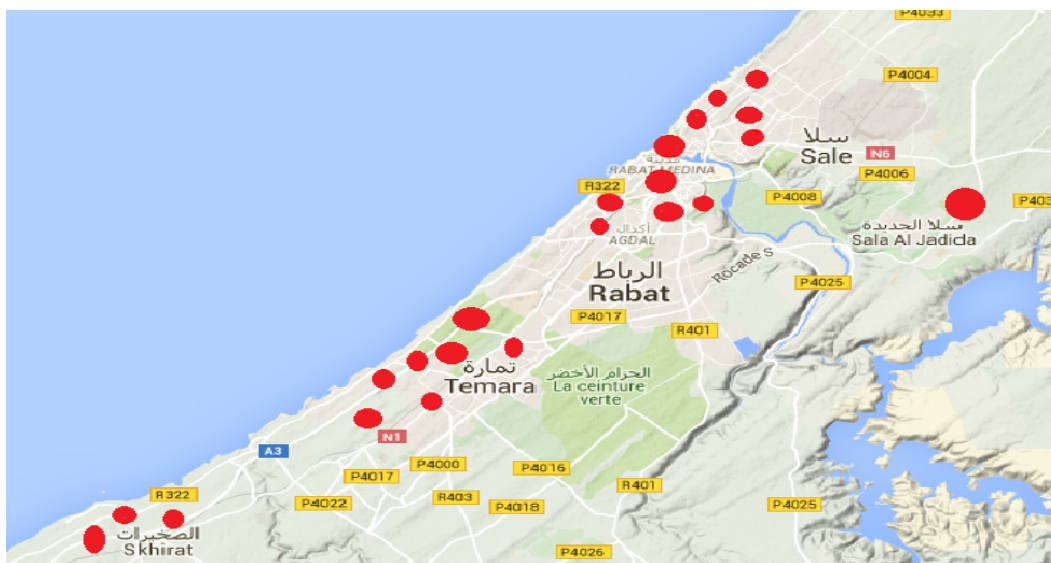


Figure 1: Distribution of ethnobotanical surveys areas (Rabat, Sale and Temara)

3. Results and discussion

The information collected from this ethnobotanical study was entered on raw data sheets and then transferred to a database, processed and analyzed. This makes it possible to gather as much information as possible on the frequency of use of this medicinal plant in the three cities; plant parts used, modes of preparation and commonly traditional uses of this species.

3.1. Frequency of use of Medicinal plants according to the profile of respondents

3.1.1. Use of the *bereztem* plant according age group

The use of this medicinal plant in the study area of Rabat, Sale and Temara is widespread in all age groups, with predominance among those aged between 40 and 50 years (31%) and a rate of 28% for the age 20 to 30 years. The age groups [30-40] and [50-60] come next with a percentage of 20% and 16% respectively. People over the age of 60 have a percentage of 1%. Whereas, for very young people (<20 years), the percentage is very low (4%). In young people, there is a low percentage of use of this medicinal plant compared to other age groups. This may be explained by the lack of experience and the poor transmission of know-how from the elderly to the young (**Figure 2**).

3.1.2. Use of the *bereztem* plant by sex

Women and men use this plant with a predominance of women. Indeed, 57% of women surveyed use this medicinal plant against 43% of men (**Figure 3**). Results are related the transmission of therapeutical knowledge between generation. These results are in consonance with other studies carried out at around numerous Moroccan areas which showed that women are more dependent on traditional phytotherapeutic knowledge than men [14,15, 16].

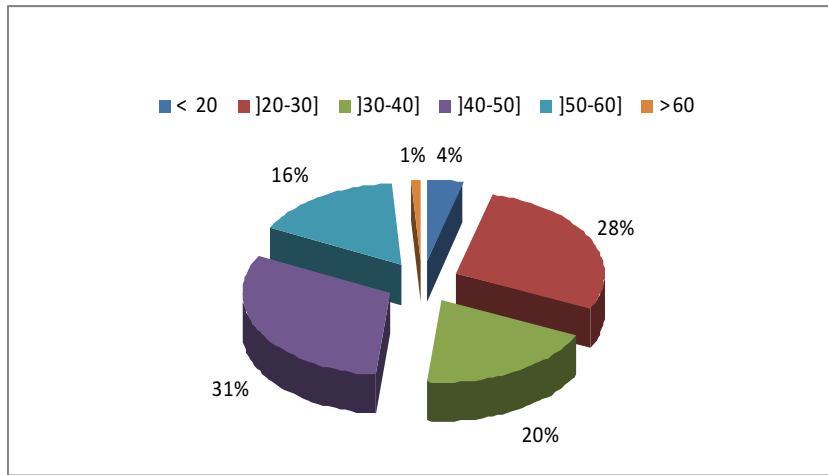


Figure 2: Percentage of use of *Aristolochia longa* according to the age Group

3.1.3. Use of the bereztem plant according to the level of study

In the study area of Rabat, Sale and Temara, the vast majority of those surveyed who are familiar with the use of bereztem are university students, with a percentage of 46% (Figure 4). This can be explained by the fact that students, university professors and civil servants have knowledge about the use of medicinal plants and their therapeutic uses. However, people with primary and secondary education have a non-negligible percentage of knowledge (25%). Those of the illiterate, they use very little this plant with a percentage of 19%. Medicinal plants can be dangerous when used unconsciously and this is confirmed in illiterate people who cannot understand precisely the verbal instructions transmitted by herbalists and healers [15].

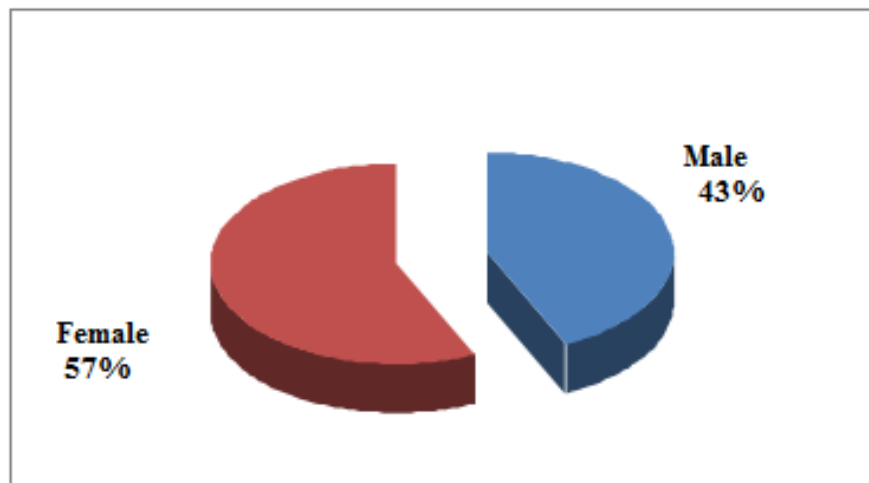


Figure 3: Percentage of use of *Aristolochia longa* according to the sex

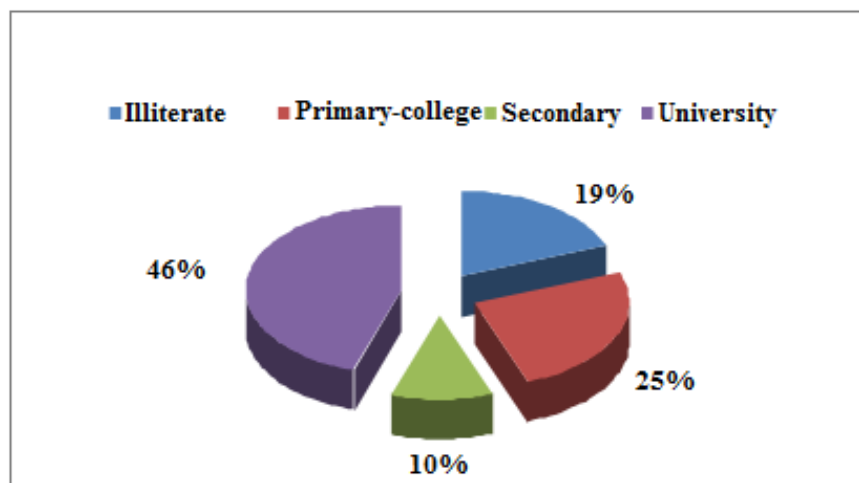


Figure 4: Percentage of use of *Aristolochia Longa* according to the level of study

3.1.4. Use of the bereztem plant according to the family situation

This plant is much more used by married people (49%) than by divorced persons (5%) or widows (5%). This can be explained by the fact that they are responsible as parents to give first aid especially for their children.

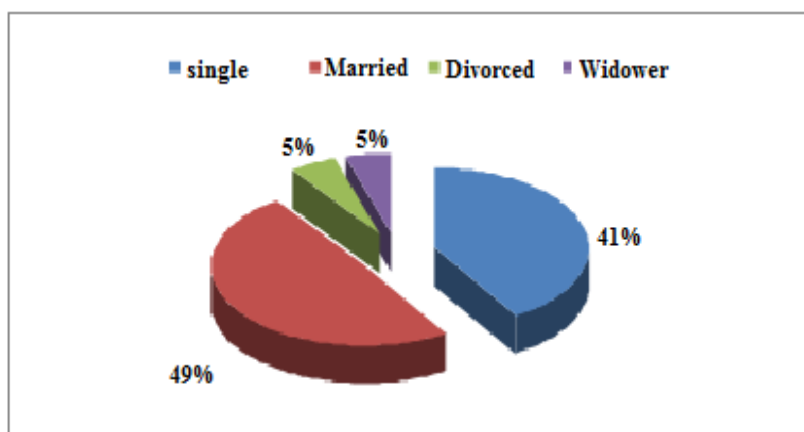


Figure 5: Percentage of use of *Aristolochia Longa* according to the family situation

3.1.5. Use of the bereztem plant according to monthly income

Surveys show that the use of modern medicine is correlated with the stability or regularity of income. This situation could be explained by the poverty of the populations. On the other hand, the use of traditional medicine seems to be much more motivated by the ease of its acquisition and by its reduced cost which is two to four times cheaper compared to modern medicine. This is the case of this study, which shows that people without monthly income have the highest percentage of use of the bereztem plant, ie 38%. While, people with modest monthly income (250-1500Dhs) and people with average monthly income (155-5000Dhs) have a relatively large frequency of 22%. On the other hand, people with a monthly income more than average and better have knowledge about the use of *Aristolochia longa* with a frequency of 10% and 8% respectively (Figure 6).

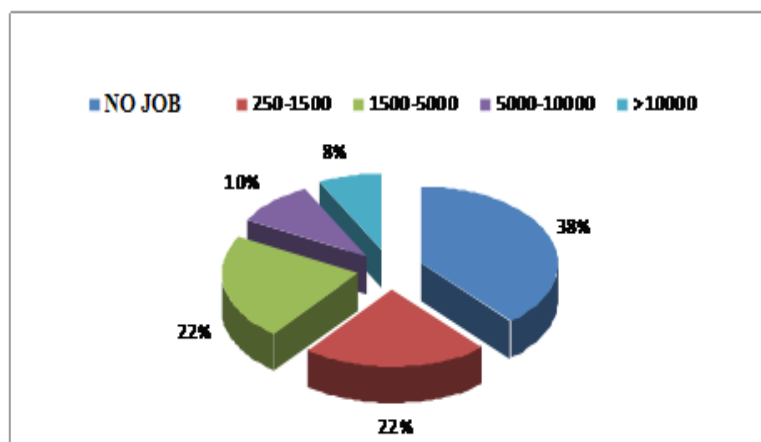


Figure 6: Percentage of the use of *Aristolochia Longa* according to monthly income

3.1.6. The Use of the bereztem according to the dose

Most of the users questioned about this plant in the three cities: Rabat, Sale and Temara use it with unspecified doses. Overdose can result in adverse health effects. The population studied uses this medicinal plant with unspecified doses with a percentage of 94.8%. Whereas, 5.2% of these populations use them with specific doses (Figure 7).

3.1.7. Use of the bereztem according to the origin of the information

Much the information gathered about the origin of the therapeutic use of this plant is the experiences of others, with a percentage of 49%. This reflects the image of the relative transmission of traditional practices from one generation to the next. Achab-Atar or the herbalist takes an important place with 23% as the second source of information. Reading has a percentage of 19% which means that people are starting to take interest in traditional medicine seen the benefits it offers. The category of pharmacists has a percentage of 5% and the media comes last with a percentage of 4% (Figure 8).

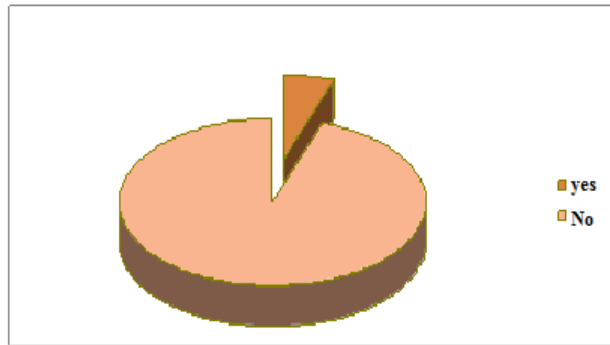


Figure 7: Percentage of the use of *Aristolochia Longa* according to the dose

3.1.8. Side effects related to the use of bereztem

According to our study, 44% of people in the region of Rabat, Sale and Temara believe that this plant allows a cure of the diseases treated. Side effects and poisoning then come with equal percentages (17%). It has been declared states of toxicity and even an aggravation of the disease especially in people with cancer. 9% believe that the bereztem plant only allows an improvement in the state of health. The category "no idea" represents a percentage of 11%.

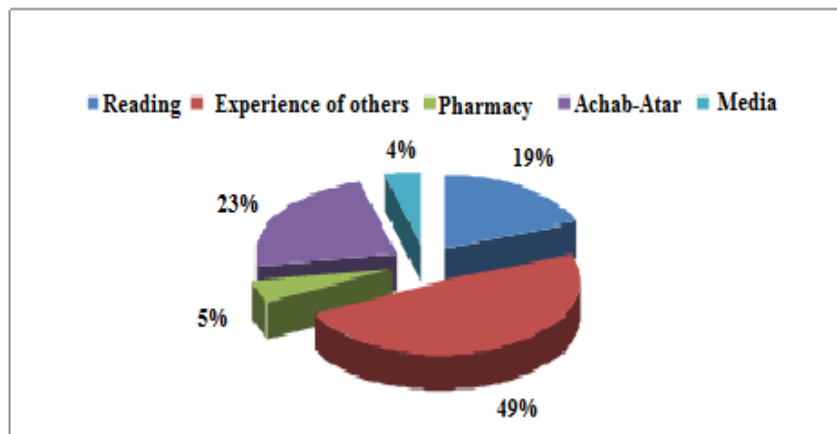


Figure 8: Percentage of the use of *Aristolochia Longa* according to the origin of the information

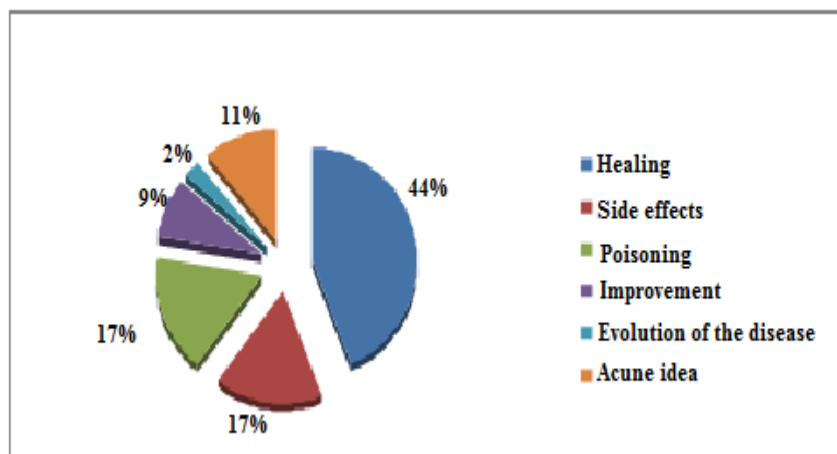


Figure 9: Side effects related to the use *Aristolochia Longa*

3.2. Therapeutic use of the bereztem plant

3.2.1. Used Parts

Each part of the plant has different therapeutic properties. For this, the medicinal plants can be used whole or in part (leaf, stem, root, bulb and flower).

In our study area, the use of the underground part is predominant with a percentage of 67% (**Figure 8**). The whole plant occupies the second place with a percentage of 20%. The leaf occupies an average place with a rate of 10%. The other parts have percentages below 2%.

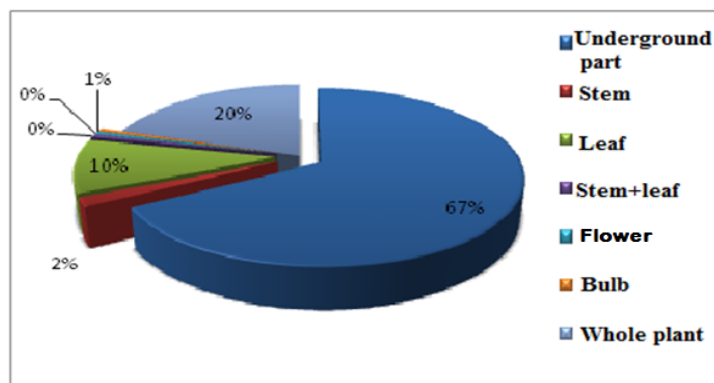


Figure 10: Percentage of the use of *Aristolochia Longa* according to the plant parts used

3.2.2. Modes of preparation

Powder is the most common mode of preparation (57%). The plant dried and crushed to obtain a powder and mixed with the honey. The second mode of preparation is the infusion by a rate 25% (Figure 11). This method involves pouring a boiling liquid over the used part of medicinal plant. Users are always looking for the simplest method of preparing drugs. The decoction, with a percentage of 8%, allows collecting the most active ingredients and attenuates or cancels the toxic effect of certain recipes [17]. Indeed, these results have been confirmed by similar studies carried out in other regions of Morocco [18, 19, 20].

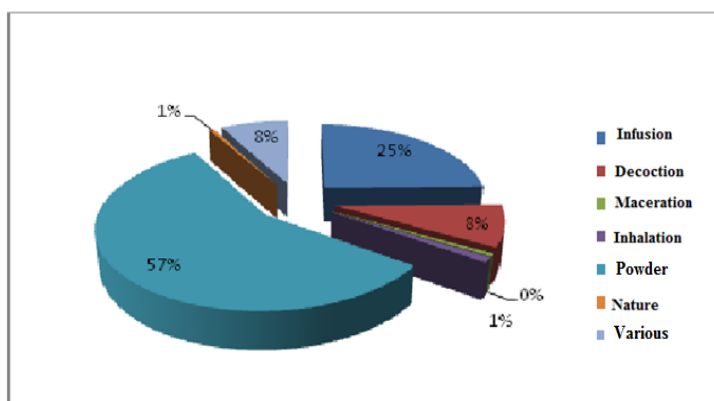


Figure 11: Percentage of the use of *Aristolochia Longa* according to the modes of preparation

3.2.3. Disease and Traditional Medicine

This work contributes to a better knowledge of practical traditional care in the cities of Rabat, Sale and Temara. This allowed us to list a number of chronic diseases treated by the Bereztem plant. The results (Figure 12) show that this plant is involved in the treatment of cancerous diseases with a percentage of 24.9%, followed by kidney disease (5.6%), ulcerated wound (5.1%). This plant is also used to grow intestinal problems and diabetes in the treatment of boumazwi, with respective percentages of 4.6%, 4.1% and 3.6%. The rest of the diseases (abortion, menstruation problem, scar, treatment of fever and appetite ...) have a rate of less than 3%.

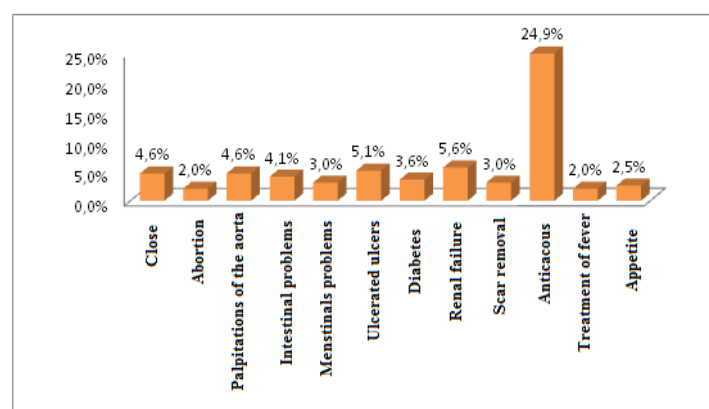


Figure 12: Percentage of the use of *Aristolochia Longa* according to the treated diseases

Conclusion

The use of all plants containing aristolochic acid has been banned in many countries in recent years. Whatever may be the species of aristoloches, they all contain this acid. This active ingredient is terrifying because it is considered a highly toxic substance. No dose without toxic effect of the latter could be determined (Traditional Moroccan Pharmacopoeia). The family of aristolochic and aristolactam acids includes mutagenic and carcinogenic molecules for the stomach, bladder, kidneys and testicles. In Morocco, *Aristolochia longa* or bereztem is a medicinal plant that has been used for a long time in traditional medicine. It owes its toxicity to aristolochic acid which is highly concentrated at the root level and which the World Health Organization considers it as carcinogenic (capable of causing cancer). The roots, pulverized or associated with the henna are used to treat the diseases of the skin. Aristolochie is an abortive plant formerly used during childbirth. The root of Bereztem is frequently used to treat one of the most dangerous pathologies, namely the cancer with a percentage of 24.9%, as well as diseases of "Boumezwi" (palpitations of the aorta), constipation, intestinal disorders, skin diseases and wounds. This plant is nevertheless poorly used in modern phytotherapy because it presents risks of toxicity and side effects with equal percentages (17%). The frequency of use of medicinal plants in the study area of Rabat, Sale and Temara is closely related to the profile of the persons surveyed. Thus, young people, compared to the elderly, do not generally know the usefulness of this species. Women and men have a shared medicinal knowledge, with a slight benefit going to women. The ethnobotanical study carried out in the region has revealed a multitude of results on the use of this medicinal plant, its parts used as well as on the diseases treated. The population studied uses this medicinal plant with unspecified doses with a percentage of 94.8. Finally, despite being rich in beneficial compounds such as polyunsaturated fatty acids with the essential linolenic and linoleic acids [21], the use of *Aristolochia* species should be discontinued because they contain nephrotoxic aristolochic acids [22].

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