

## ETHNOPHARMACOLOGICAL STUDY AND PHYTOCHEMICAL SCREENING OF THREE PLANTS (ASTERACEAE FAMILY) FROM THE REGION OF SOUTH WEST ALGERIA

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### ABSTRACT

*Anvillea Radiata, Cotula Cinerea and Matricaria Pubescens are plants belonging to Asteraceae family, they are commonly used in traditional medicine in south west of Algeria (northern Sahara), for the treatment of several diseases. The aqueous extracts of the aerial parts (leaves and stems) of these plants were subjected to phytochemical screening tests to demonstrate the existence of natural products (alkaloids, saponins, flavonoids, terpenes ... etc.) the secondary metabolisms of these may have pharmacological and therapeutic properties.*

**Keywords:** Anvillea Radiata, Cotula Cinerea et Matricaria Pubescens, Bioactive extract, Phytochemical screening

### INTRODUCTION

Because of their therapeutic properties, medicinal plants are one way of investigation the most interesting image of the discovery of new drugs from plants used in traditional medicine for the treatment of discharged diseases.

*Anvillea Radiata, Cotula Cinerea and Matricaria Pubescens* are among the most used plants in traditional medicine in the northern Sahara, they are mentioned in the ethnobotanical surveys conducted by (Maiza. 1993) and (Ould El Hadj. 2003) in Algeria and (El Rhaffari U) in Morocco. These endemic Plants are much responded in the south western Algeria.

The aim of this work is to make a pre-ethnobotanical survey and assessment of chemical bioactive extracts of these three plants by phytochemical screening.

### Botanical description of the studied plants

The three studied species are endemic; their types are common throughout the northern and central Sahara and widely used and known by the locals of the area of southwest Algeria. *Anvillea Radiata* Coss et Dur: Vernacular name (*Nogde*), very branching shrub 20-50 cm, woody base stem and branches, elongated triangle leaves, attenuated at the base in to a petiole, and lamina strongly dentate surrendered large, 4 to 5 cm in diameter including long ligules, surrounded by radiating upper leaves gradually passing the bracts, these tough, yellow-orange flowers all; glitter truncated at the top of the receptacle and a long silka chenes prismatic those from the periphery to three angle from the center of those surrendered four corner devices flowers ligules long, up to 25 mm (Figure 1). [1]

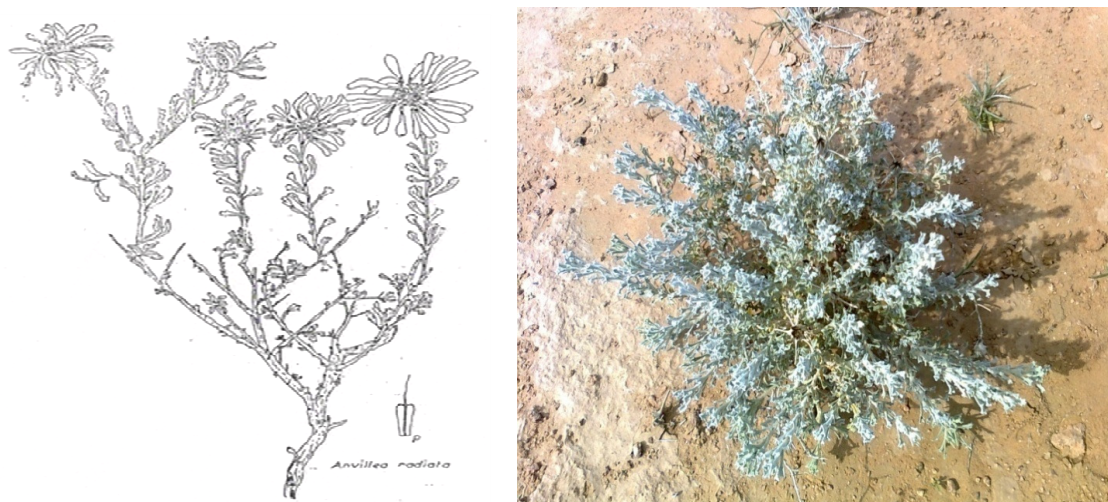


Figure 1. General morphology of Anvillea Radiata [1].

The species *Cotula Cinerea* (Del) : Vernacular name (*Guetoufa*), small whitish woolly plant leaves, thick, divided in their upper part to a 3-5 obtuse teeth; stems 10-40 cm, lying then recovered; capitula of 6 to 10 mm diameter, involucre woolly with a tubular flowers, brown buds and became golden yellow (Figure 02). [1]



Figure 2. General morphology of Cotula Cinerea [1].

The species *Matricaria Pubescens* (Desf): Vernacular name (*Quazouaza*), endemic species, well known in the southwest area of Algeria, the stems are lying then recovered, tufted, cutsheets and a hairy dark green involucre scaled with a wide margin membranous, all flowers in tubes; achene topped with a membranous scales longer than it self, rejected on one side and having the appearance of a ligule (Figure 03). [1]

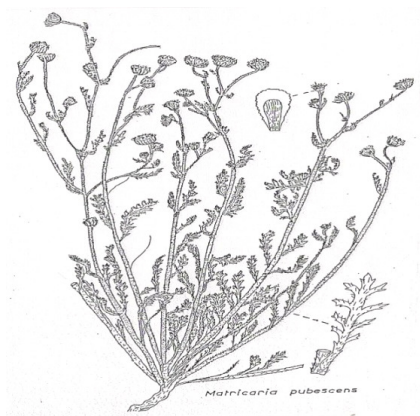


Figure 3. General morphology of *Matricaria Pubescens*[1].

## DESCRIPTION OF BÉCHAR REGION

Béchar area is located in the southwest of Algerian territory; it is bounded on the east by Adrar region, to the west by the Kingdom of Morocco, to the north by Naama and El Bayadh and to the south by Tindouf and Adrar.



Figure 04 : Location of BECHAR area in yellow on the map of Algeria

Béchar wilaya is located about 1000 km in the South-West of the capital Algies precisely on the border between Algeria and Morocco. This region extends over an area of 161,400 km<sup>2</sup>, or about 6.77% of the national territory, the wilaya of Béchar occupies the 6th place over all wilayas of Algeria. Its climate is hot and dry in summer and very cold in winter, rainfall doesn't exceeding 100 mm per year. The population is estimated at more than 251,657 inhabitants (2005 statistics). The Arabic language is the official language [8].

Plant material, extraction and phytochemical screening

The aerial parts of species, *Anvillea Radiata*, *Cotula Cinerea* and *Matricaria Pubescens*, collected in January to December, from the mountains, Lahmar City and Boukaisse city (30 to 50 km far away from Bechar), the plants have been identified and deposited in the Valorization of Resource and Food Security in Semi-Arid Areas Laboratory, South West of Algeria, University of Bechar.

The collected parts (leaves and stems) were washed, sorted and dried two months at room temperature. Then being finely pulverized using a mill blade. Extraction using soxhlet apparatus; reflux for 3 hours was performed. The residue was evaporated in vacuo apparatus, and according to the operative fashions of chemical screening one determines the present natural product in bioactive extract [6]. The high light of the main natural products is performed by standard techniques of written by (N. DOHOU. 2003) [3]. The phytochemical screening results are shown in Table 02.

## THE PHYTOCHEMICAL SCREENING METHODOLOGY

This ethno pharmacological investigation realized in the town of Bechar, during two months, failing to the pin inquiry, including one hundred persons. Questionnaire include question on vernacular name, plant parts used, the plant part from (dried or fresh), medicinal use of plant medicinal preparation methods and the taken dose. Gross-checked by interviewing old people aged between 60 and 75 years old, who had traditional knowledge about plants [6].

The results of the survey are included in Table 01 with a comparison of our results and those of other investigations.

## RESULTS AND DISCUSSION

### Therapeutic Use of Plants *Anvillea Radiata*

This plant is widely used in traditional medicine in the region for the treatment of several diseases including: diabetes, Indigestion, cold, the stomach aches and the pulmonary diseases. The leaves and stems are the most used parts.

### Therapeutic Use of *Cotula Cinerea*

Several diseases are treated by this such as: Colic, Cough, Diarrhoea, Headache, and Digestive Disorders. All parts of the plant are used.

### Therapeutic Use of *Matricaria Pubescens*

This plant is used in the treatment of the following diseases: Gastric Ulcer, Gas, Asthma, Cough, Allergy, Ocular disorders, rheumatism. All parts of the plant are used.

According to the treated diseases, the three plants are used in different forms: a) Maceration, b) Decoction, c) Infusion, or d) Inhalation

**Table 1. Survey Results and Comparison with other work**

		Traditional use	
		In Algérie	In Morocco
Plants	Our Survey (South West of Algerian)	Maiza. K & al [3] (Sahara septentrio	Ould elhadj M. DIDI & El Rhaffari U & al   (Sahara septentrional es (South est of Maroc
<i>Anvillea Radiata</i>	<a href="#">Diabetes</a> , <a href="#">Indigestic</a> <a href="#">Cooling Pulmonary</a> <a href="#">Cold and</a> <a href="#">Upset stomach</a>	<a href="#">Cooling Pulmonar</a> <a href="#">Diabetes</a> , <a href="#">Indigesti</a> Aches.	<a href="#">Cooling Pulmonary</a> , <a href="#">Indigestion</a> .
<i>Cotula Cinerea</i>	<a href="#">Colic</a> , <a href="#">Cough</a> , <a href="#">Diarr</a> <a href="#">Migraine and</a> <a href="#">Headache</a> , <a href="#">Disorders</a> <a href="#">Digestive</a> , <a href="#">Gastric Ulcer</a> , <a href="#">Gas</a> , <a href="#">Asthma</a> , <a href="#">Cough</a> , <a href="#">Allergy</a> , <a href="#">Rheumatism</a> , <a href="#">Ocular Disorders</a> .	Sunstroke, <a href="#">Colic</a> , <a href="#">Cough</a> , Colds Broncho- Pulmonary <a href="#">Cough</a> , <a href="#">Allergy</a> , <a href="#">Rheumatism</a> , <a href="#">Ocular</a> <a href="#">Disorders</a> , Aches, Dehydration, Teething, Dysmenorrhea.	<a href="#">Colic</a> , <a href="#">Diarrhea</a> , <a href="#">Cough</a> , Cooling Broncho-Pulmonary Fever <a href="#">Gastric Ulcer</a> , <a href="#">Gas</a> , Indigestion, <a href="#">Asthma</a> , Conjunctivitis
<i>Matricaria Pubescen</i>			

[Convergence of the results of the fourths surveys](#)

[Convergence of the results of our survey with the results of other investigations in Algeria](#)

[Convergence of the results of our survey with the results of the Moroccan investigation](#)

### The non-convergence of the results

It was noted that there is a convergence between the results of our investigation and the results of other surveys, this traditional therapeutic use agreement is probably due to the nomads movement between the two countries, transmitting their knowledge during their travels local populations [3], or probably this convergence results from the strong emigration of the Algerians in the colonial period (the revolution war) to the Moroccan territory.

### Results of the phytochemical screening

- The Alkaloids are present in significant amount in *Anvillea Radiata* and in an average quantity in *Cotula Cinerea*, the lowest amount is represented in *Matricaria Pubescens*.
- The Saponins are present in large quantities in *Anvillea Radiata*, *Cotula Cinerea* and *Matricaria Pubescens* have an average amount.
- Terpenoids, Tannins, Flavonoids, Steroids and Cardenolides are present in significant amounts in all of the species studied with an

average amount in tannins in *Matricaria Pubescens* and an average quantity Cardenolides in *Cotula Cinerea* and the smaller amounts in Flavonoids and presents at *Anvillea Radiata*.

**Table 2. Results of the phytochemical screening**

Natural products	Medicinal plants		
	<i>Anvillea Radiata</i>	<i>Cotula Cinerea</i>	<i>Matricaria Pubescens</i>
Alcaloids	+++	+	++
saponins	+++	++	++
Terpens	+++	+++	+++
Tanins	+++	++++	++
Flavonoides	++	+++	++
Free Flavonoids	+	++	++
Heterosids Flavonoids	+	+++	++
Glycosidic Flavonoids	+	+++	+++
Steroids	+++	+++	+++
Cardenolids	+++	++	+++

+++ : important Presence, ++: average Presence and +: weak presence

## CONCLUSION

The ethno pharmacological Survey conducted in Béchar region, from the Algerian South west, shows that the three plant species (*Anvillea Radiata*, *Cotula Cinerea* and *Matricaria Pubescens*) are widely used in traditional medicine in the area, in various forms of medicinal preparations, they are used to treat various diseases (diabetes, Indigestion, cold, upset stomach and the cooling lung using the plant *Anvillea Radiata*; Colic, cough, diarrhea, Migraine, headaches and digestive disorders using the plant *Cotula Cinerea* and ulcer gastric, gas, asthma, cough, Allergies, Ocular Disorders and rheumatism using the *Matricaria Pubescens* plant).

The therapeutic effects are induced by various chemical compounds (Alkaloid, Flavonoids, Terpenoids, Saponins, Sterols and Tannins). Which constitute the scientific basis for the traditional therapeutic use of the tested plants [10].

Our results can be used for the purification of the active principle of plants studied in further research for the preparation of improved forms of effective remedies based on these plants [9].

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