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Phytochemicalstudyofrootsandleaves of the plant *EchiumpycnanthumPomel*

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ABSTRACT

Phytochemical studies of leaves and roots of the plant EchiumpycnanthumPomel (family Boraginaceae) revels thepresence of Flavonoids, Tannins, Quinones, Alkaloids, Saponins, Stérols and absence of Anthocyanes and Coumarines.

Keywords: *Echiumpycnanthum*, phytochemical studies, Tannins, Quinones, Alkaloids, Saponins.

INTRODUCTION

Echiumpycnanthum Pomel (family Boraginaceae) is a wild plant, endemic to the arid and desert. The leaves and stems are very hairy. The root sand red corolla purple or purplish blue [1]. It is well known among traditional healers, is traditionally used to treathepatitis. This is especially the roots which are used and sold in markets. The need to replace these chemicals with natural products led us to a phytochemical study of root sand leaves of the plant *Echiumpycnanthum Pomel.*

MATERIALS AND METHODS

EchiumpycnanthumPomel was collected in their natural habitat in the region Sebdou (region of Tlemcen, Algeria) during the month of January 2009, and dried away from direct sunlight. The dried plant material is then milled and stored at low temperature until use.

Screening Phytochemical

1.1. Polyphenolic substances

For assays of tannins, flavonoids and anthocyanins, we prepared a 5% aqueous infused.

1.1. Tannins

5 ml of aqueous 5% infused are added to 1 ml aqueous solution of $FeCl_3$ to 1%. A dark blue color, black or green indicates the presence of tannin or gallic catechism.

To make the differentiation between tannins we used Stiasny reagent (10 ml 40% formalin and 5 ml concentrated HCl):

30 ml infused were added to 15 ml reagent Stiasny. Heated in a water bath at 90 º C / 15 min.
- Obtaining a precipitate indicates the presence of tannin catechism.
- The precipitate filtered and saturated with sodium acetate and 1 ml of 1% FeCl3. A blue-black staining indicates the presence of gallic tannin [2].

1.2. Flavonoids
2 ml of aqueous infusion is added to 2 ml of hydrochloric alcohol and 0.2 g of powdered magnesium. Orange or red coloration indicates the presence of flavonoids [2, 3].

1.3. Anthocyanins
2 ml of aqueous infused are added to 2 ml of 2 N HCl The appearance of a pink-red turns blue-violet by the addition of ammonia indicates the presence of anthocyanins[2, 3].

1.4. Anthracene free: quinine
2 ml of a chloroform extract are added to NH4OH diluted by half. A red color indicates the presence of quinones[2].

1.5. Coumarins
1 g of plant powder is placed in a tube in the presence of a few drops of distilled water. The tube is covered with paper soaked in NaOH is diluted and boiled. Yellow fluorescence indicates the presence of coumarins after examination under ultra-violet [4].

2. Alkaloids
Maceration for 24 hours, 2 g of plant powder with a mixture of 50 ml H2SO4 diluted to half. The mixture filtered and rinsed with water to obtain 50 ml of filtrate.

Then we took two test tubes in which we introduced 1 ml of macerated. We added to tube 1: 5 drops of reagent and Mayer in tube 2: 5 drops of reagent Wagner. The presence of turbidity or precipitate after 15 minutes indicates the presence of alkaloids [2].

3. Steroids
3.1. Saponins
In a test tube containing about 5 ml of an ethanolic extract, a drop of sodium bicarbonate solution was added. The test tube was shaken vigorously and left for 3 minutes. Formation of froth indicates the presence of saponins[2].

3.2. StérolsandTerpènoides
Liebermann-Burchard’s test
2 mg of dry extract was dissolved in acetic anhydride, heated to boiling, cooled and then 1 ml of concentrated sulphuric acid was added along the sides of the test tube. Formation of green colour indicates the presence of steroids[2].

RESULTS AND DISCUSSION

The constituents of the plant from the secondary metabolism, provide excellent identification of the drug. For plants whose chemical composition is unknown, and to get an idea about their business, we must seek to identify specific active ingredients.

Phytochemical tests are performed on different extracts prepared from leaves and roots, dried and crushed. The detection method of the different families of chemical compounds co-existing, is a reaction of precipitation, turbidity, flocculation or staining reagents. The results are classified according to:

• *Very positive reaction: +++*
• *Positive reaction: ++.*
• *Moderately positive reaction: +*
• *Negative reaction: -*

The experimental results shown in Table 01, show that tannins, flavonoids, anthracénosides, the saponins and sterols and triterpenes are present in leaves and roots of *Echiumpycnanthum*, with varying intensities.

The tannins are present with significant intensity in the leaves compared to roots. Its presence is confirmed by a positive reaction with ferric chloride solution giving a dark green color, so this catechin tannins.

Roots appears to be richest in saponins from the leaves. We noticed the presence of quinones in the roots, alkaloids in the leaves, and the total absence of coumarins and anthocyanins in both parts of the plant.

Table 01:Phytochemical tests were not performed or extracts from leaves and roots Prepared of *Echiumpycnanthum*

Phytochemical compounds		Résultats	
		Leaves	Roots
Phenolic compounds	Flavonoids	++	++
	Tannins	+++ Tannins catéchists	++ Tannins catéchists
	Quinones	-	+++
	Anthocyanes	-	-
	Coumarines	-	-
alkaloids	Alkaloids	+	-
Stéroïds	Saponins	++	+++
	Stérols and triterpènes	+	+

According to previous studies, species of the genus Echium are rich in alkaloids pyrrolizidiques[5-8](Roeder et al. 1991; El-Shazly et al. 1996a; El-Shazly et al. 1996b; El-Shazly et al., 1999) Known for its carcinogenic properties and hepatotoxicity, and naphthoquinone (shikonin and alkanines) [9,10] (Brigham et al., 1999, Han et al., 2008).

These data are comparable with our results, as tests revealed the presence of alkaloids in leaves and roots of quinones in our plant.

The composition of the species *Echiumpycnanthum* not described in the literature. However *Echiumvulgare* contains alkaloids pyrrolizidiques [6], flavonoids [11], phénolcarboxyliques acid, rosmarinic acid [12], sterones[13] and naphthoquinones[14]. The presence of these has been proven even in the roots of *Echiumlycopsis*[15] and *Echiumitalicum*[16]. *Echiumhumile* also contains alkaloids and even pyrrolizidiquestetrahydroisoquinoline[6] and *Echiumplantagineum* is known for its high anthocyanin [17].

CONCLUSION

Echiumpycnanthum appears as a plant rich in secondary metabolites may have valuable pharmacological properties.Polyphenolic substances identified during our testing phytochemicals could indicate that this species has an antioxidant activity at higher or lower. The saponins and flavonoids with great intensity in this case, could through their fungicidal properties, said antiseptic properties [18]. The plant could thus be considered as part of the antimicrobial and antioxidant activity.

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