

STUDY OF THE BIOLOGICAL ACTIVITY OF B-CARBOLINE ALKALOIDS COMPOUND

BENBOTT Amel^{1,2*}, KAROUCHE Saida^{1,2}, MOSBAH Camilia^{1,2}, BOUMARAF Takwa¹,
AYADI Djihane¹

¹Laboratory of natural substances, bioactive molecules and biotechnological applications, Larbi Ben
M'hidi University, Oum El Bouaghi, Algeria

² Biology Department, Nature and Life Sciences Faculty, Larbi Ben M'hidi University, Oum El
Bouaghi, Algeria

Code CCP 9

Email*: amel04091980@gmail.com

Introduction & Objectives:

Peganum harmala belongs to the family Zygophyllaceae [1], and it is one of the most widely used plants in Algerian folk medicine in the treatment of jaundice and relieving joint pain [2], and rheumatism [3]. The aim of this study is to contribute to the evaluation of some biological activities of the roots extracts of *P.harmala* alkaloids, which are grown in Sidi El-Raghis region - Oum El Bouaghi country.

Methodology (Material and methods):

Classical method of extraction of indole alkaloids [4], the yield of alkaloids in the roots was estimated at 2.34%. The chromatographic study (TLC) showed that the root extract contains two types of alkaloid compounds represented by harmine and harmaline using a solvent system consisting of (methanol / chloroform / ammonia) (79-20-1(V)). The analysis of antioxidant activity using DPPH and FRAP methods showed that the harmine had a significant activity in capturing free radicals (IC₅₀= 46.89 ± 0.31 µg/ml), (EC₅₀ = 0.12 ± 0.05 µg/ml), respectively.

Results and Discussion:

The results of the anti-inflammatory activity showed For the alkaloids compounds, there were significant differences compared to the control compound represented by diclofenac, the best value was recorded with the harmine compound (EC₅₀= 22.71± 0.52 µg/ml). Regarding the anticoagulant activity, the results related to the time effect showed a very important difference with respect to both APTT and PT, where the best values were recorded with harmine, with both tests with (37.94 ± 3.07 seconds), (23.57 ± 2.11 seconds), respectively. The antibacterial activity of different alkaloids extracts was estimated against three reference strains: *P. aeruginosa*, *S. aureus* and *E. coli* using the agar method in nutrient medium. These results showed that the crude alkaline extract of the roots was the strongest against strain *S aureus* with damping area diameter of 20 mm.

Conclusion:

We conclude that *Peganum harmala* is a plant rich in alkaloids and especially β-carboline alkaloids such as : harmine, harmaline and harmal, making it one of the most important medicinal plants for treating a variety of disorders, used as an anti-inflammatory, it also has a strong antioxidant and anticoagulant activity. As the current information shows, it is also possible that the β-carboline alkaloids might be useful in the development of new drugs to treat various diseases.

Keywords: *Peganum harmala*, alkaloids, antioxidant activity, anti-inflammatory activity, anticoagulant activity, antibacterial activity.

References

1. Mahmoudian, M. ., Jalilpour H., Salehian P. (2002), Iranian Journal of Pharmacology & Therapeutics, 1 1-4.
2. Baba-aissa, F. (2000). Encyclopedie des plantes utiles :flore d'Algérie et du Maghreb. Substances végétales d'Afrique d'Orient et d'Occident, Édas. Librairie moderne ed, Rouiba, Algérie
3. Benbott, A., Mosbeh, C., Karouche, S ., Hamadouche, N., Mahdi, D. (2022). Notulae Scientia Biologicae, 14 (2) :11211.
4. Bruneton, J(1999) . Pharmacognosie, Phytochimie, Plantes médicinales. (3 ème éd). Paris : Editions médicales internationales, éditions Tec & Doc Lavoisier,

