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# A preliminary investigation into the endemic plant *Crataegus monogyna Jacq*, and its traditional use the El Tarf region (North-East Algeria).

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**ABSTRACT**

An ethnobotanical survey was conducted among 200 indigenous inhabitants of the El-Tarf region, aiming to promote the local flora of the region, in particular its use in traditional medicine. The study focused on the Crataegus monogyna Jacq plant, and analysis of the results showed that women (53%) used the plant much more than men (47%). On the other hand, fruit consumption was dominant (54.97%), followed by leaves (39.74%) and then flowers (5.30%). Crataegus monogyna Jacq is consumed by this community to treat cardiovascular disease (35.61%), hypertension (25.76%), and the digestive tract (23.48%). As well as for diabetics (3.79%), stress (7.58%), the liver (4.5%), and also for treating wounds (3.79%). The ethnobotanical study highlighted the importance of social life in this region, which has enabled people to preserve the traditional knowledge inherited from their ancestors (53.8%) and their families (35.09%). The current investigation also serves to enhance the local heritage of the El-Tarf region by contributing to a database that will be used to enrich research in the fields of phytotherapy, pharmacology, and phytochemistry, as well as guide researchers towards new alternatives based on natural substances.

**Keywords**: Ethnobotanical survey, Crataegus monogyna Jacq, Herbal medicine, El Tarf. El Kala National Park.

## INTRODUCTION

Human beings have been relying on plants for their nutritional, therapeutic, and cosmetic needs since the emergence of life on Earth. Medicinal plants are the primary method of treating illness and are strongly

endorsed by the World Health Organisation (Chan, 2014). El-Tarf region harbours rich and diversified vegetation, enabling the local population to practice phytotherapy (Rekioua et al., 2022).

Medicinal plants have been extensively recognised as a valuable reservoir of curative components that help prevent and treat a wide range of diseases (Bencheikh et al., 2021). The traditional medicine of El-Tarf involves the use of both wild and cultivated plants found in the region (Rekioua et al., 2022).

*Crataegus monogyna Jacq* is an endemic shrub that plays an important role in the biodiversity of the El-Tarf region and enriches El Kala National Park. This medicinal plant is commonly used in phytotherapy in the studied region, is resistant to pollution, and also plays a part in replenishing marine exposure. (Hamel et al., 2018; Lazli, 2019; Maamar-Sameut et al., 2020; Ouadeh et al., 2021).

*Crataegus monogyna Jacq* is recognised for its sedative, vasculo-protective, antioxidant, and anxiolytic properties (Bahorun., 1997). The natural active substances obtained from its fruit have numerous uses in cosmetology, industry, and nutrition, these compenents contain a high proportion of secondary metabolites, which are of particular relevance in the field of therapeutics (Bahorun, 1997).

Since medicinal plant extracts could be a valuable source of bioactive molecules with antioxidant, antimicrobial, and antidiabetic activity for pharmaceutical indications (Radi et al., 2023). Given that ethnobotanical study has broadened to become the science that studies the relationships between plant and cultural diversity as well as the perceptions, uses, and management of plants (Albuquerque & Hanazaki 2009; Houéhanou et al., 2016). The present investigation aims to expand the knowledge of the medicinal *plant Crataegus monogyna Jacq*. in therapeutic contexts. Furthermore, it intends to promote the use of local flora and encourage the preservation of the traditional pharmacopoeia of the El Tarf region.

## MATERIALS AND METHODS

### Investigated area

El Tarf City encompasses 24 communes and 7 daïras, is situated at the north-eastern extremity of Algeria, and extends over an area of 2,891.75 Km². The studied plant pertains to the El Kala National Park (PNEK, see Figure 1), a large protected area that ensures the preservation of biodiversity and shelters a unique vegetation cover within the Mediterranean basin.

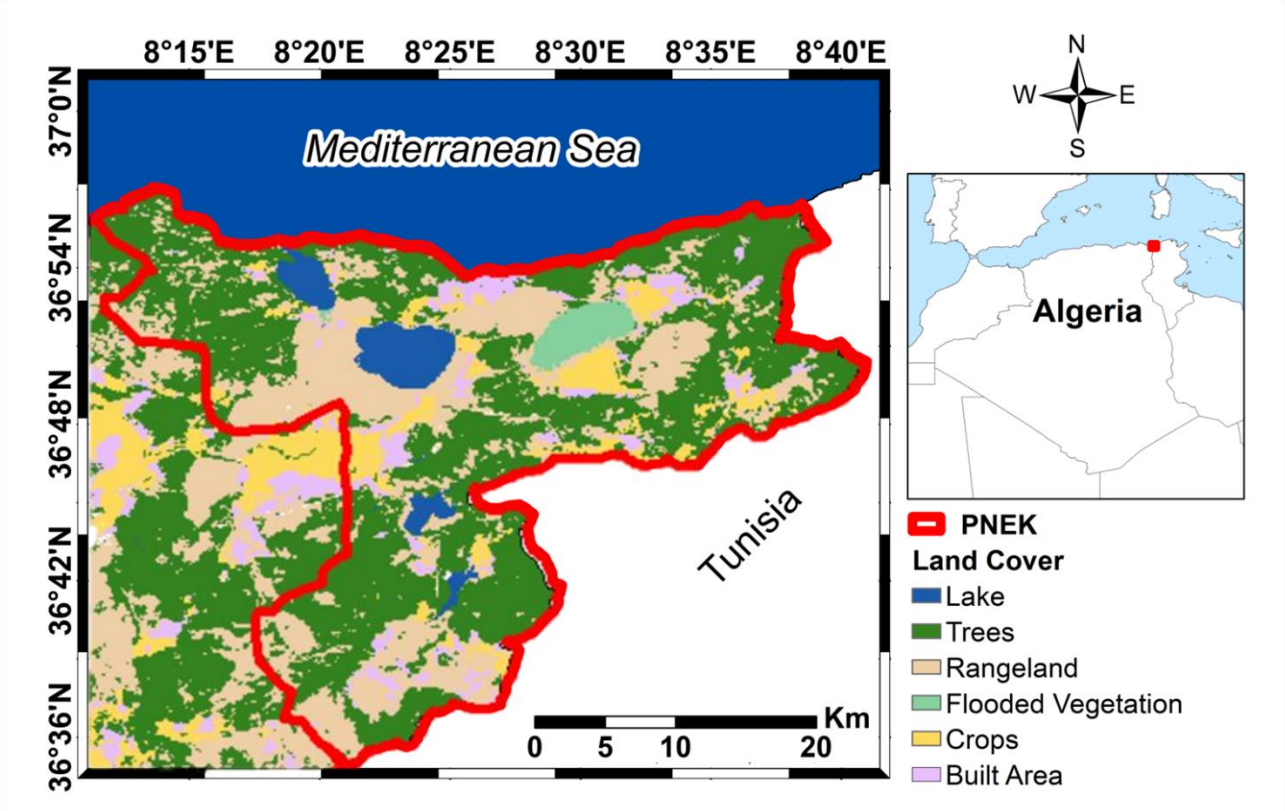


**Fig.1.** The investigated area, the land cover was retrieved from Sentinel-2 satellite imagery (2024)

**Ethnobotanical study**

The ethnobotanical survey was performed through direct interviews in several communes of El Tarf, using a form to gather information from January to December 2022.on the local knowledge and traditional therapeutic applications of *Crataegus monogyna Jacq* (See Figure 2).

**Fig.2.** Leaves, fruit and flowers of *Crataegus monogyna Jacq* in El Kala National Park.

**Investigation sheet**

| | |
|---|---|
| Médicinal species | Scientific Name : ……..…….. |
| | Local appellation : ……..……. |

• **Sex :** ☐ Male ☐ Female •**Age**: ☐ 20-40 years ☐ 40-60 years ☐ >60 years

• **Used parts :** ☐ Leaves ☐ Flowers ☐ Seeds ☐ Roots ☐ Stem ☐ Whole plant

• **How to use :** ☐ Costs ☐ After drying

• **Method of preparation :** ☐ Steam bath ☐ Poultice ☐ Infusion ☐ Poudre

• **Way of consumption :** ☐ Alone ☐ Partner

• **Method of administration :** ☐ Internal ☐ External

• **This plant is a remedy for :**

……...

……...

• **Side effects :**

……...…

……...

• **The plant is not recommended for :** ☐ Newborn ☐ Child ☐ Pregnant woman

• **Source of your information :**

……..…

……...

**Fig.3.** Investigation sheet.

## RESULTS AND DISCUSSION

The survey randomly interviewed 200 people of different genders, ages, and intellectual levels. The data collected from the survey forms (See Figure 3) was processed using IBM SPSS, Statistics 25 (System Package for Social Sciences, version 25). Percentages were used to present the most relevant results.

### According to the gender of the population questioned

Figure 4a shows the proportion of plant use according to gender. Females dominate the exploitation of Crataegus monogyna Jacq, with 53% compared to 47% for males. Our results are consistent with previous studies emphasising that women are more involved than men in phytotherapeutic treatments, preparing plant-based recipes, and maintaining their ancestral heritage (Meddour et al., 2020; Bouallala et al., 2014; Rekioua et al., 2022). Moreover, the use of medicinal plants by women goes beyond therapeutic objectives. It has been revealed that their role as mothers often makes them the main providers of plant-based care, particularly for their children. (Lazli, 2019; Benkhnigue et al., 2011; Djekoun et al., 2022; Rekioua, 2023).

### According to the age of the population questioned

The results depicted in Figure 4b indicate that people aged over 60 are the most dominant age group, with a rate of 53%, followed by those in the 40–60 age group, with a rate of 47%. Our results are similar to those obtained by several authors, highlighting that older people are more committed to herbal medicine and preserving and protecting traditional knowledge and expertise. (Meddour et al., 2020; Djekoun et al., 2022; Kadri et al., 2018; Bouallala et al., 2014; Rekioua, 2023).

### According to the part of the study plant used

According to our results, the most commonly used part of Crataegus monogyna Jacq is the fruit (Figure 4c), with a percentage of 54.97%, followed by the leaves (39.74%), and finally the flowers (5.30%). The majority of inhabitants of El Tarf prefer to prepare their recipes using the fresh plant (Figure 4d). Their appreciation of the fruits of medicinal plants has been equally evident in other communities. (Ngbolua et al., 2021; Hamel et al., 2018), and the same applies to the leaves, which come in second rank. (Djekoun et al., 2022; Rekioua et al., 2022; Maamar-Sameut et al., 2020). These preferencs can be justified by the ease of harvesting and the concentration of photochemical reactions in these parts, resulting in a reservoir of organic matter. In addition, these parts are the locus of photosynthesis and the secondary metabolites responsible for the plant's biological properties (Chamouleau, 1979).

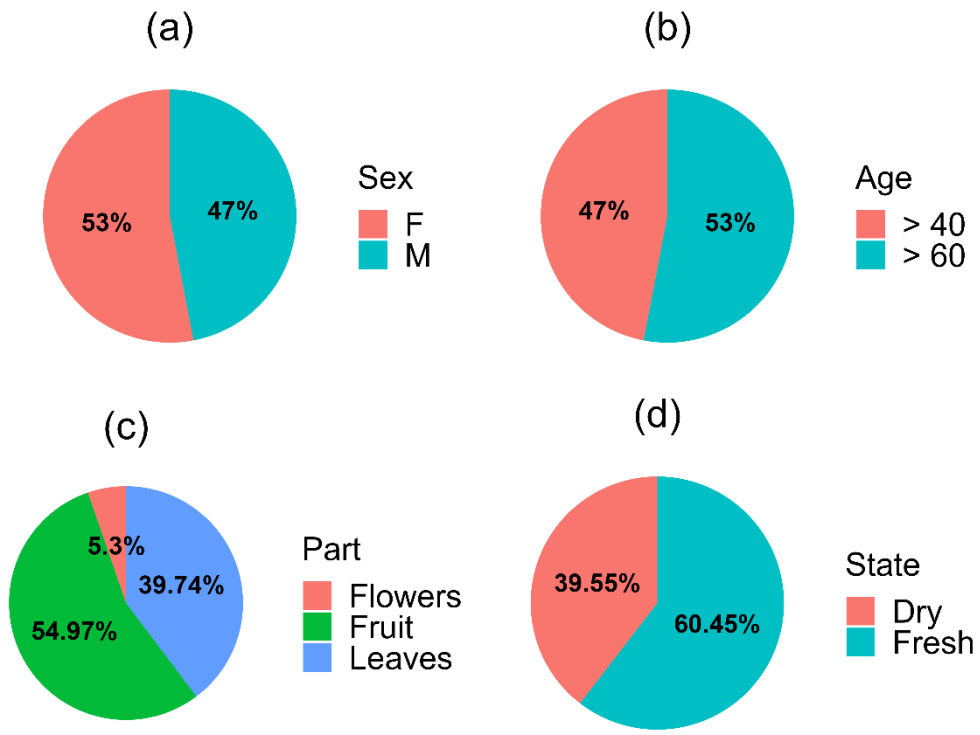


**Fig.4. a** and **b**: Demographic descriptors of the corpus questioned, **c** and **d:** Percentage of users according to the part used, and d the mode of consumption.

**According to diseases treated**

Figure 5a depicts the percentage of diseases treated by *Crataegus monogyna Jacq*. A high proportion of responses indicated that *Crataegus monogyna Jacq* is a remedy for cardiovascular disease (35.61%). Our results are in line with those reported by Ouadeh et al., 2021; Meddour et al., 2020; Maamar-Sameut et al., 2020; and Hamel et al., 2018. Followed by the treatment of hypertension (25.76%) and digestive tract problems (23.48%). The results also show that *Crataegus monogyna Jacq* can be recommended for treating stress (7.58%) and diabetes (3.79%). Our findings are consistent with those reported in the investigations of Radi et al., 2023 and Meddour et al., 2020. Furthermore, according to the population surveyed, this plant is indicated for disinfecting wounds and skin inflammations (3.79%). Considering previous research emphasising the usefulness of *Crataegus monogyna Jacq* fruit extract for its antimicrobial effect (Radi et al., 2023). These traditional practices can be justified by the safety, efficacy, economic feasibility, and accessibility of the plant (Bencheikh et al., 2023).

**According to the source of information**

The responses obtained concerning the source of information on Crataegus monogyna Jacq as a medicine are shown in Figure 5b. The results revealed that a large part of this use is attributed to knowledge inherited from ancestors (53.8%), followed by family practices transmitted from one generation to another (35.09%). Thus, recognising the importance of social life in El Tarf City. These skills are preserved by older women

(Ilbert et al., 2016; Meddour et al., 2020) and transmitted from generation to generation (Ilbert et al., 2016; Meddour et al., 2020). It should be stressed that this local knowledge inherited from ancestors is not limited to medical practices but also extends to traditional gastronomic and cosmetic production (Rekioua et al., 2022; Lazli et al., 2019; Ouadeh et al., 2021).

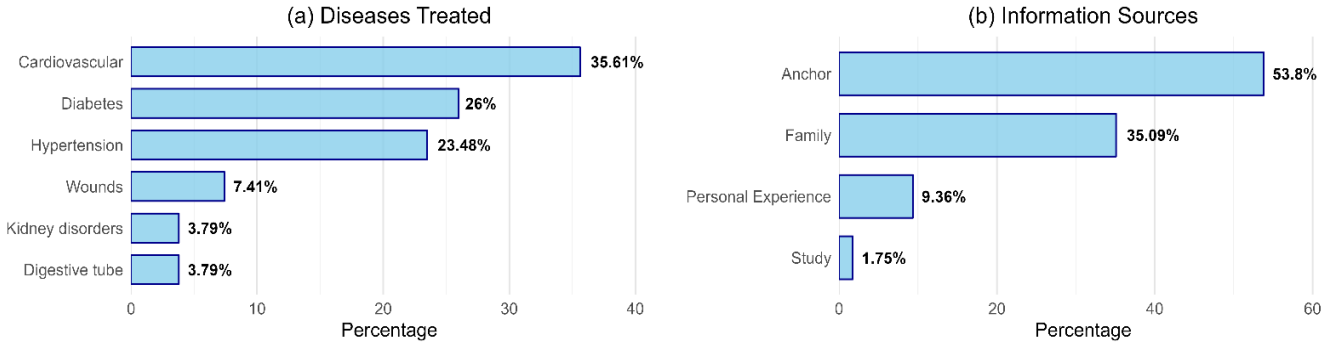


**Fig.5. a**: Percentage of diseases treated by *Crataegus monogyna Jacq,*. **b**: source of information by population surveyed.

## CONCLUSION

The therapeutic practices of the indigenous people of the El-tarf region (North-East Algeria) are essentially based on aromatic and medicinal plants. A great deal of effort is being devoted to ensuring their preservation and sustainability in order to preserve local expertise and the therapeutic practices of the people of the El-Tarf region. The present study consists on an ethnobotanical survey of a medicinal plant from the Rosaceae family, *Crataegus monogyna Jacq*. The survey was carried out to enhance the value of natural resources. This endemic plant is widely used in traditional medicine and is abundant in the El-Kala national park. The survey involved a sample of 200 people from various intellectual backgrounds who were randomly interviewed on their use of Crataegus monogyna in different districts of El-Tarf.

The information gathered highlighted the knowledge passed on from the ancestors and the wider family, underlining the importance of social life in this area. Older women preserve this knowledge and pass it on from generation to the next. The gathered information from the local community indicates that the fruit and leaves of *Crataegus monogyna Jacq* could be effective as a remedy for cardiovascular disease, high blood pressure and digestive tract problems. In addition, consumption of the fruits and leaves of Crataegus monogyna Jacq can be recommended for treating stress, diabetes and as an aid in healing wounds. In the light of these results, the inhabitants of the El-tarf region are looking to aromatic and medicinal plants as alternatives in primary care. Accordingly, we propose to widen the circle of investigation to cover other regions and other plants. In order to identify and protect our medicinal flora and to create a database on the plants used in traditional medicines, their location and their remedies, as well as their undesirable effects. These are our perspectives to contribute to the preservation of the wealth of flora and local know-how and to

guarantee access to this heritage on a local and international scale, allowing specialists to experimentally validate all types of traditional practices and plant-based remedies.

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**REFERENCES**

[1] Albuquerque, U. P. and Hanazaki, N. (2009). Five problems in current ethnobotanical research—and some suggestions for strengthening them. Human Ecology. 37, 653–661

[2] Bahorun, T. (1997). Substances naturelles actives, la flore mauricienne, une source d'approvisionnement potentielle. - AMAS (Éd). Food and Agricultural Research Council. Mauritius.

[3] Bencheikh, N., Bouhrim, M., Merrouni, I.A., Boutahiri, S., Legssyer, A. and Elachouri, M. (2021). Antihyperlipidemic and antioxidant activities of flavonoid-rich extract of Ziziphus lotus (L.). - Lam. fruits. *Appl. Sci*. 11, 77- 88. https://doi.org/10.3390/ app11177788

[4] Bencheikh, N., Radi, F.Z., Fakchich, J., Elbouzidi, A., Ouahhoud, S., Ouasti, M., Bouhrim, M., Ouasti, I., Hano, C. and Elachouri, M. (2023). phytochemical, toxicological, and pharmacological properties of Ziziphus lotus (L.). - Lam.: A comprehensive review. *Pharmaceuticals*. 16, 575.

[5] Benkhnigue, O., Zidane, L., Fadli, M., Elyacoubi, H., Rochdi, A. and Douira, A. (2011). Étude ethnobotanique des plantes médicinales dans la région de Mechraâ Bel Ksiri (Région du Gharb du Maroc). *Acta Bot. Barc*. 53, 191-216.

[6] Bouallala, M., Bradai, L. and Abid, M. (2014). Diversité et utilisation des plantes spontanées du Sahara septentrional algérien dans la pharmacopée saharienne. Cas de la région du Souf. - Revue ElWahat pour les Recherches et les Etudes. 7 (2), 16 – 24.

[7] Camara, A. K., Keita, T., Camara, A. A., Tonguino, T. G, Kourouma, A., Kolie, A., Soumah, A., Balde, S., Traore, N. and Traore, M. S. (2022). Enquête ethnobotanique sur l'utilisation des plantes médicinales dans le traitement des affections bucco-dentaires dans la commune de Kindia en République de Guinée. - Revue RAMReS - *Pharm. Méd. Trad. Afr*. 21(2), 107-115.

[8] Chamouleau, A. (1979). Les usages externes de la phytothérapie. - Ed. Maloine S. A paris.

[9] Chan, M. (2013). Stratégie de l'OMS pour la médecine traditionnelle pour 2014-2023. http://apps.who.int/iris/bitstream/handle/10665/95009/9789242506099_fre.pdf?sequence=1

[10] Djekoun, M., Boughendjioua, H., Khelfaoui, M.S., Boubekeur, M.S., Djekoun, M., Rekioua, N., Benaliouche, F., Saidi, N.E.H., Riadi, F. (2022), Ethnobotanical Survey of Medicinal Plant Mentha rotundifolia (L.) Huds. in El Tarf, Extreme Northeast of Algeria. - *Journal of Complementary Medicine Research*. 13(1), 17-21. DOI: 10.5455/jcmr.2022.13.01.04

[11] Doukkali, Z., Bouidida, H., Srifi, A., Taghzouti, K., Cherrah, Y. and Alaoui, K. (2015). Les plantes anxiolytiques au Maroc. Études ethnobotanique et ethno-pharmacologique. - *Phytothérapie*. 13, 306-313

DOI 10.1007/s10298-015-0921-z. © Lavoisier SAS 2015.

[12] Hamel, T., Saadou, S., Seridi, R., Boukhdiri, S. and Boulemtafes, A. (2018), Pratique traditionnelle d'utilisation des plantes médicinales dans la population de la péninsule de l'Edough (Nord-est algérien). *Ethnopharmacologia,* 59, 75-81.

[13] Houéhanou, D.T., Assogbadjo, A. E., Chadare F. J, Zanvo S. and Sinsin B. (2016) . Approches méthodologiques synthétisées des études d'ethnobotanique quantitative en milieu tropical. Spécial Projet Undesert-UE. *Annales des Sciences Agronomiques*. 20, 187-205.

[14] Ilbert, H., Hoxha, V., Sahi, L., Courivaud, A. and Chailan, C. (2016). Le marché des plantes aromatiques et médicinales : analyse des tendances du marché mondial et stratégies économiques en Albanie et Algérie. - CIHEAM. (Ed) Option méditerranéenne. SERIES : Etudes et recherches. Montpellier. France.

[15] Kadri, Y., Moussaoui, A. and Benmebarek, A. (2018). Étude ethnobotanique de quelques plantes médicinales dans une région hyper aride du Sud-ouest Algérien «Cas du Touat dans la wilaya d'Adrar». - *Journal of Animal & Plant Sciences*. 36 (2), 5844-5857. http://www.m.elewa.org/JAPS

[16] Lazli, A., Beldi, M., Ghouri, L., Nouri, N.H. (2019). Étude ethnobotanique et inventaire des plantes médicinales dans la région de Bougous (Parc National d'El Kala,- Nord-est algérien). - Bulletin de la Société Royale des Sciences de Liège. 88, 22–43.

[17] Maamar-Sameut, Y., Belhacini, F. and Bounaceur, F. (2020), Etude ethnobotanique dans le sud-est de chlef ( algerıe occıdentale). - *Revue agrobiologia*. 10(3), 2044-2061.

[18] Meddour, R., Ouahiba, S. and Ouyessad, M. (2020). Ethnobotanical survey on medicinal plants in the Djurdjura National Park and its influence area, Algeria. - *Ethnobotany Research and Applications.* 46,1-25. http://dx.doi.org/10.32859/era.20.46.1-25

[19] Ngbolua, K.N., Molongo, M.M., Libwa, M.T.B., Amogu, J.J.D., Kutshi, N.N. and Masengo, C.A. ( 2021). Enquête ethnobotanique sur les plantes sauvages alimentaires dans le Territoire de Mobayi-Mbongo (Nord-Ubangi) en République Démocratique du Congo - Rev. Mar. Sci. Agron. Vét. 9(2), 259-265.

[20] Ouadeh, N., Benhissen, S., Belkassem, A., Bendif, H. and Rebbas, K. (2021). Etude ethnobotanique et inventaire des plantes médicinales de la région de Dréat ( M'Sila, Algérie). - Géo-Eco-Trop. 45(4), 617-633.

[21] Radi, F.Z., Bencheikh, N., Anarghou, H., Bouhrim, M., Alqahtani, AS., Hawwal, M.F., Noman, O.M., Bnouham, M. and Zair, T. (2023). Quality control, phytochemical profile, and biological activities of Crataegus monogyna Jacq. and Crataegus laciniata Ucria fruits aqueous extracts. - Saudi Pharmaceutical Journal. 31. 101753. https://doi.org/10.1016/j.jsps.2023.101753

[22] Rekioua, N., Boumendjel, M., Taibi, F., Samar, M. F., Mediouni Ben Jemaa, J., Benaliouch, F., Negro, C., Nicoli, F., De Bellis, L., Boushih, E. and Haouel, S. (2022). Insecticidal effect of

Eucalyptus globulus and Rosmarinus officinalis essential oils on a stored food pest Ephestia kuehniella (Lepidoptera, Pyralidea). - Cellular and Molecular Biology. 68(4), 144-157. DOI: http://dx.doi.org/10.14715/cmb/2022.68.4.18

[23] REKIOUA, Naouel. (2023). Contribution à l'étude de quelques activités biologiques des plantes aromatiques et médicinales de la région d‟El-Tarf. Thèse de doctorat. *Université Chadli Bendjedid El-Tarf*. P : 157.

[24] Salhi, S., Fadli, M., Zidane, L. and Douira, A. (2010) : Études floristique et ethnobotanique des plantes médicinales de la ville de Kénitra. - LAZAROA. 31, 133-146