



## Effects of Extracts of Cumin and Thyme on Pain

T D. Souhoudji<sup>\*1</sup>, R. Aboufatima<sup>1</sup>, A. Ouacherif<sup>2</sup>

<sup>1</sup>Department of biology, Faculty of science and techniques of Béni Mellal, Morocco

<sup>2</sup>Department of biology, Faculty of science Semlalia of Marrakech, Morocco

### Abstract

The cumin and the thyme are plants widely spread in the Mediterranean Basin, they are known of several antique and recent cultures which used them and which still use them in diverse use (custom). In Morocco, they are used as much as spice, but also traditionally as much as healing plants. *Cuminum cyminum* is especially used in the cure of the intestinal pains and also as relaxant against stress. *Thymus broussonetii* is a plant, which abounds in the spontaneous state in Morocco. It is widely used for the treatment of diverse pathologies, in particular gastrointestinal disorders, cough, and diseases of the cold or still to relieve certain pains. Besides, its powerful bactericidal and fungicidal activities make a plant of choice for the use for culinary and pharmaceutical purposes. For this purpose, we tested the effect of the extracts of thyme, cumin and some mixture of these two extracts by oral route in the test of the heating plate. The administration of cumin produced an analgesic effect more important than that of the thyme, in comparison with the group a witness. The effect of the mixture of the extracts of the thyme and the produced cumin a similar effect has that of the thyme

**Keywords:** Cumin *Cuminum*, *Thymus Broussonetii*, Analgesic Effect, Heating Plate, Aqueous Extract.

### Corresponding author: T D. Souhoudji

Department of biology, Faculty of science and techniques of Béni Mellal, Morocco.

Email: [souhoudji1991@gmail.com](mailto:souhoudji1991@gmail.com)

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### Introduction

The therapeutic use of plants goes back to earliest times of human hood. Indeed, the official history of the herbal medicine takes its "roots" there are several millenniums.

3000 years before J.C, the first collection known for vegetable formulae (suspensions, decoctions and ointments) engraved (burnt) in cuneiform characters on clay tablets, discovered to Nippur in 1948, dates time (period) Sumerian about 5000 years ago. It lists (counts) up to 250 sorts (species) of plants with diverse manufacturing processes of potions flavors (perfumes) and ointment (Fork, on 2000).

2900 BC, «shen Nung Ben Cao Jing» (emperor Shen Nung's handled treaty of healing plants) famous manuscript including the detailed description of 356 healing plants classified according to their natures and their toxicity is written in China.

In pharaonic Egypt, medicine was strongly mixed with the religious and magic practices, for example the papyrus Ebers (document dating 1600 before J.C. found at Louksor) describes the manufacturing of more than 800 remedies from animal ingredients, vegetal and mineral origin (Lansky, in 1999). But the succession of the rational herbal medicine begins only with the Greek then Latin doctors, treaties of the Greek doctor Discoride (during first one century AD) translated into latin under the name of *Maoteria Medical* inventoried more than 500 drugs of diverse origins, was left by centuries during an unchanged reference on the subject.

During the middle Ages, it is the works of Arabic doctor that contributed to the protection of this classic art science and its spread in the world. (Forked, 2000; Lansky, on 1999).

From Renaissance to the current time, the discovery of new plants comes of unknown countries and the development of science such as chemistry and pharmacy allowed a renewed interest for medicinal herbs which become from now on source of active ingredients used during medicinal syntheses.

After long reluctances, the WHO recommends to-day in all the developing countries to list, to estimate, and to integrate the traditional medicine into their system of health especially everything related to the small pathologies (Pelt, on 1997).

The cumin and the thyme are plants known for their numerous therapeutic virtues, they are also known for their toxicity. Numerous scientific re-searches proved several of the uses in popular medicines, certain even tried to clarify the mechanism of some of these biological activities.

The choice of the cumin is based on the fact that this plant is widely used in Moroccan traditional medicine to handle and relieve the abdominal pains of youths and adults. The choice of the thyme is based on the fact that this plant is used in traditional medicine to handle the pains generally with visceral origin (stomach, intestines), somatic (muscular not located) and stomatological (lesion of the oral epithelium, ulcers of the mouth, toothache). This work consists in testing separately the extracts of each of these plants on the pain and in examining the effect of a mixture of the extracts of both plants on the same function.

## Material and Methods

### Plant Material

To realize this work, we used seeds of *Cuminum cyminum* (the cumin) and the whole plant of *broussonetii* *Thymus* (the thyme). The thyme was collected at the top Atlas and the cumin around of the city of Ben-grir “.

### Preparation of extracts.

The seeds of the cumin and the whole plant of the thyme were dried in the shade before being crushed. The powder of every plant is then used to prepare an aqueous extract in the following way: 50 g of each powder is diluted with 300 ml of distilled water. The suspension is then put in a bain-marie in 50°C for 12 pm the obtained extract is then spindried in 3000 hanging 20 minutes, its floating is tak-en then completed by some water distilled for a final volume of 100 ml.

### Animal Material

We used rats (150-200 g) raised to the pet shop of the Faculty of science Semlalia, in standard conditions (12h/12h light darkness, and ambient temperature of 25°C). They have free access to the food and to the water. For all the made tests, animals are distributed according to

the type of treatment in four batches:

**The Lot 1:** rat witnesses having received the water orally.

**The Lot 2:** rat treated by the aqueous extract of cum-in orally.

**The Lot 3:** rat treated by the aqueous extract of thyme orally.

**The Lot 4:** rat treated by a mixture (50%-50 %) aqueous extracts cum-in-thyme orally.

### Test of the heating plate

Rats are filled up at first by a probe of force-feeding by the various extracts (extracted from thyme, extracted from cumin, mixture of both ex-tracts and distilled water) 45 min beforehand. After-ward, every animal is placed on a heating metallic plate which temperature is maintained in 55°C (Julie and al, on 2008); a cylinder in transparent polyester (30 cm high and 20 cm in diameter) prevents any escape attempt.

The latent period (of reaction) is the time, which puts the animal to lick itself the later legs ei-ther to jump. Any animal exceeding the 20 seconds of latency is considered unfit of the test; it will be removed from the experience.

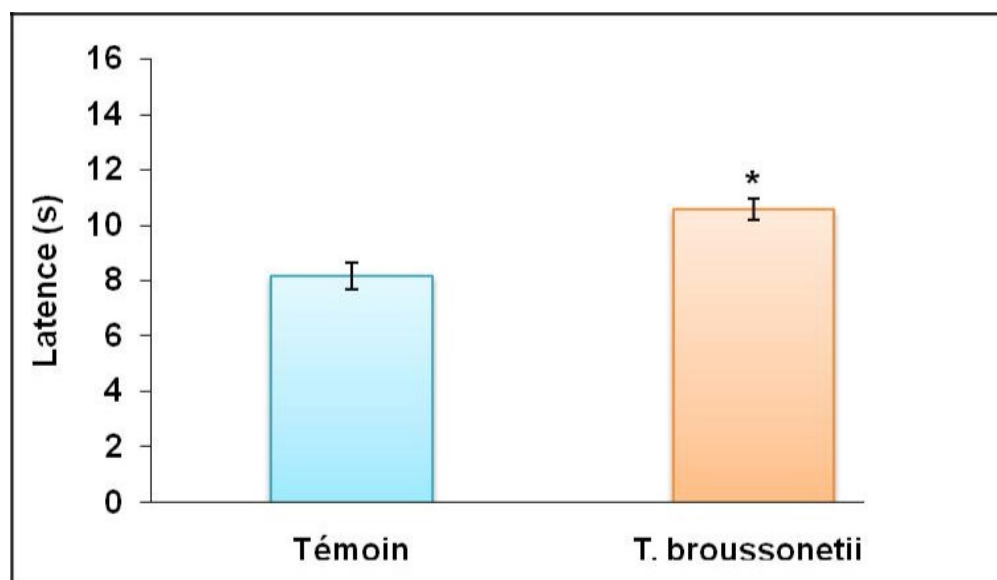
### Statistical Analysis

The statistical analysis was made by the ANOVA .All the data are expressed as means  $\pm$  SD. The dif-ferences between the groups were analyzed by the test of Tukey. A value of p 0, 05 and p 0, 01 was considered as statistically significant

### Analysis of the Results

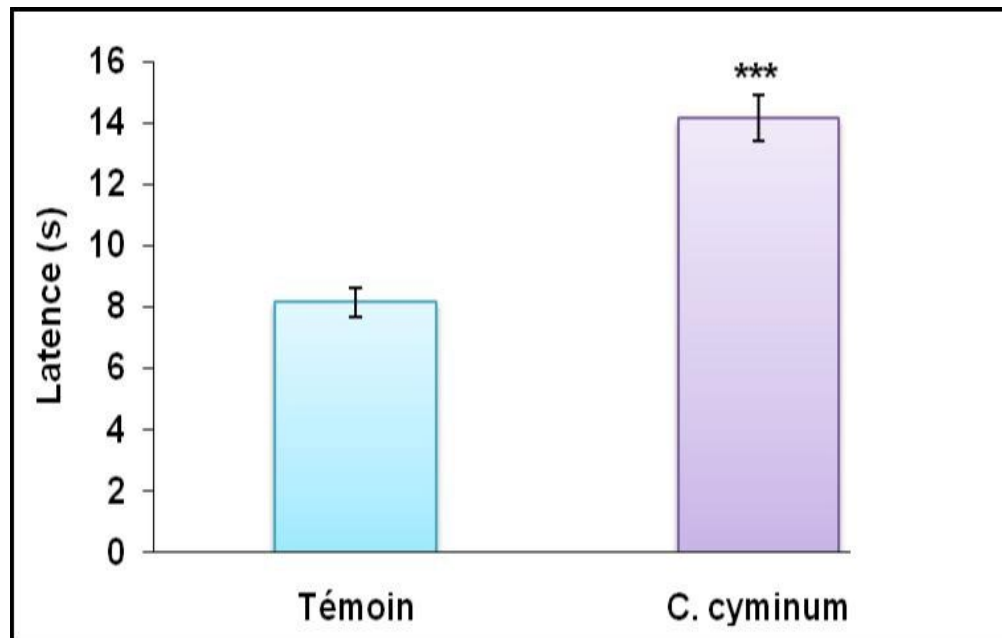
The realized works demonstrated that the extract of *Cuminum cyminum* possesses an effect statistically more significant (Fig. 2, 4) than that of the thyme (Fig. 1). The mixture (cumin + thym) (Fig. 3).

With regard to the witness group, the extract of the thyme produced a slightly significant effect (p 0,05) (Fig.1).



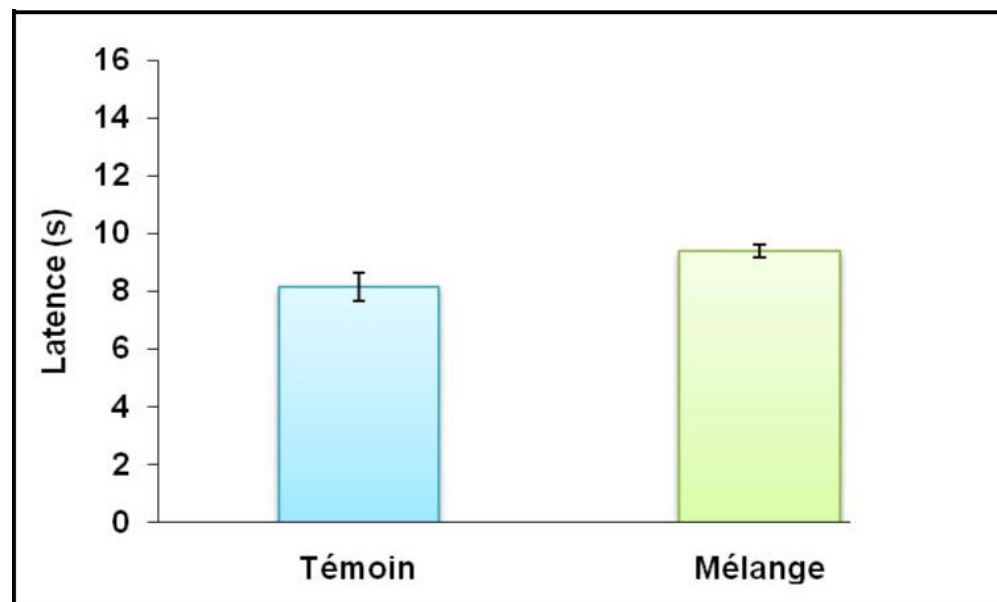
**Figure 1:** effect of the aqueous extract of *Thymus broussonetii* on the sensibility nociceptive in the test of the heating plate.  $0,01 < p < 0,05$  \* in comparison with the witness

The extract of the cumin possesses a very significant analgesic effect ( $p < 0,001$ ). While the mixture of both extracts did not show significant analgesic effect ( $p > 0,05$ ) compared with the group witness (Fig. 2).

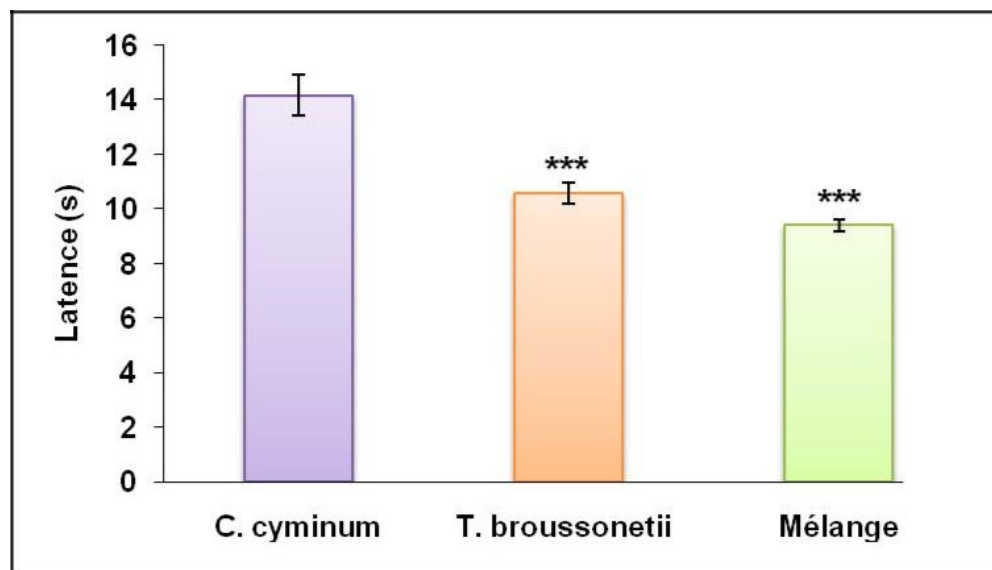


**Figure 2:** effect of the aqueous extract of *Cuminum cyminum* (the cumin) on the sensibility nociceptive in the test of the heating plate.  $P < 0,001$  \*\*\* in comparison with the witness

The analgesic effect of the extract of the cumin is statistically more important ( $p < 0,001$ ) than the effect of the extract of the thyme and the mixture of both extracts (thyme + cumin) (Fig. 3).



**Figure 3:** effect of the mixture of the extracts of the thyme and the cumin on the sensibility nociceptive in the test of the heating plate



**Figure 4:** comparison enters the analgesic effect of the aqueous extracts of cyminum C. and T. Broussonetii and of mix them on the nociceptive sensibility in the test of the heating plate.  $P < 0,001$  \*\*\* in comparison with the extract of C. cyminum

## Discussion

The researchers in the field of the pharmacology give more and more importance for medicinal plants not only with the aim of their use in herbal medicine and in aromatherapy but also to extract molecules with therapeutic effect. This should not surprise us given that humans always called out plants to look after itself. From this perspective, we have chosen the most used plants in traditional medicine.

During this work, we did not try to test aqueous extracts of Cuminum cyminum, Thymus broussonetii and some mixture of these two extracts orally on the sensibility nociceptive to rats.

We estimated at first the analgesic effect of every extract taken independently, then to try to see the effect of a mixture (50%-50%) of these two extracts. Two arguments are in favour of the choice of these extracts:

The composition of these plants: the present second-ary metabolites in extracts are endowed with a big biological activity. Previous studies, also within our laboratory (Elhabazi, on 2007; Hrimech, on 2011) demonstrated that the aqueous preparations (decoction, infusion, total extract ...) of these plants have proved the most active.

In the test of the heating plate, the results revealed that the oral treatment by the aqueous extract (50%) some cumin exercises a strong activity anti-nociceptive to the animal. The active components of this extract, mainly phenolic type (chap), such as flavonoids and isoflavonoïdes would have spread (broadcasted) through the g intestinal barrier. This could be explained by the hydrophilic nature of the-se molecules which can cross the liver without un-dergoing modifications. Besides, certain studies at-tribute to this plant an effect on the central nervous system, the activity which would show itself through sound on the locomotive activity (Khatibi and al, on 2008) and on the nociceptive sensibility in the test of the tail-flick (Sayyah and xsal, on 2002) On the other hand, the oral treatment by thym does not exercise an activity anti-nociceptive very significant to the animal. Yet it is in contra-

dition with what is borrough back in the literature (Elhabazi, on 2007). Indeed, the aqueous extract of T.broussonetii is supposed to contain many com-pound assets endowed with a biological activity, compounds flavonoïdiques among which the lutéoline, the eriodictyol, quercetin as well as hétérosides flavoniques such as lutéoline-7-O-glucoside, lutéoline-3 O-acide O-acide glucuronique and eriodictyol7Oglucoside (Ismaili and al. 2002; Ismaili, on 2004).

Our results could be explained either by the fact that the active components of this extract were not diffused through the gastronomic-intestinal barrier, or by the way of extraction that we used would not have managed to extract all of the present active in-gredients in the plant.

The test of the heating plate is a test sensitive to the analgesic with central action (Abbott and Melzack, on 1982), it is likely in this case of face (figure) that compounds present in the extract of Cuminum cyminum are endowed with a central an-algesic activity, what would explain the obtained result (profit), while the present secondary metabo-lites in the extract of Thymus broussonetii would act rather as analgesic peripheral, what returns them un-detected by the use test. The mixture of both extracts of Cuminum cyminum and broussonetii Thymus had no anti-nociceptive significant effect. We expected that the effect combined (organized) by two plants considered as their analgesic effect produces an effect up-per to their effect only grip. It would be possible that the active metabolite of both extracts enters compe-tition within the receivers; the resultant in this case would be an effect lower than the one, which we ex-pected. But more thorough experiences are neces-sary to confirm this established fact.

## Conclusion

The objective of this study was to estimate the analgesic effect of the aqueous extracts of cyminum Cumin and broussonetii Thyme to confirm or dis-pute their traditional use.

The realized works demonstrated that the extract of Cumin cyminum

possesses an effect statistically more significant than of that of the thyme. The mixture (cumin + thyme), on the other hand had no effect which we expected. The mechanisms of action of extracts as well as the reason why the mixture is less active than extracts set independently still remain to clarify. The results obtained on the extract of the cumin confirm its use by the Moroccan population in the treatment of the abdominal pains.

In perspective, it would be interesting to carry out an in-depth chemical study in order to isolate and identify the active principle(s) responsible for the observed activities. It would also be interesting to verify other pharmacological effects of these plants on nociceptive sensitivity by varying tests and routes of administration.

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