



RESEARCH ARTICLE

THERAPEUTIC EVALUATION OF *CENTELLA ASIATICA* MACERATE ON SURGICAL COMPLICATIONS OF OVARIOHYSTERECTOMY IN THE BITCH

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Abstract

Background and objectives: The management of post-operative complications such as severe inflammatory reactions, suture dehiscence and abdominal hernia in farm animals calls for a variety of practices, including the use of plant resources. The aim of this study is to explore practices for managing surgical complications in bitches and the healing properties of *Centella asiatica*.

Methods: Discussions were organised with bitch owners about the practice of ovariohysterectomy and its importance for the well-being of the animals. The harvested plant was then prepared and the resulting crushed material was macerated, followed by the addition of drinking water. The subjects were divided into two batches of 6 animals: the control batch (batch 1) and the extract batch (batch 2). Before applying the macerate, the wounds were cleaned with distilled water and then an absorbent paper towel was used to dry them.

Results : Application of *C. asiatica* macerate to post-operative wounds in female dogs showed good clinical applicability, with anti-inflammatory and wound-healing accelerating activity. The therapeutic potential of the plant is thought to be attributable to its most important bioactive components.

Conclusion : The study argues that *C. asiatica* could be a better alternative for surgical wound closure, helping breeders to minimize intervention costs.

Keywords: Bitches, *Centella asiatica*, healing properties, Ovariohysterectomy, postoperative complications.

INTRODUCTION

Centella asiatica Linn Urban is a traditional Chinese medicine, a common edible plant that has been used in traditional medicine in Asia for thousands of years¹. It is a medicinal plant belonging to the Apiaceae family and major ingredient in nutraceutical products in Southeast Asian countries. The plant is known to be rich in the flavonoid quercetin, and topical application or oral administration of isolates has not caused any significant problems²⁻⁵. As far as its therapeutic properties are concerned, this plant is recognised for its many effects, including its ability to promote healing, relieve inflammation, reduce pain and provide antioxidants, in addition to enhancing and preventing memory problems in patients⁶. *C. asiatica* is considered to be one of the oldest herbal remedies used to treat and heal wounds. Its use, either alone or in combination with other medicinal plants, has produced very significant results in the healing of wounds in many patients. It is naturally distributed in Guinea, in humid, aerated environments.

The major constraints of livestock farming require their owners to carry out surgical procedures. Ovariectomy has become a standard surgical procedure, performed almost routinely in all veterinary practices. It is considered to be a well-controlled procedure. Despite this fact, complications can occur: strong inflammatory reactions, suture dehiscence, abdominal hernia. These complications may be related to the animal's behavior towards its injury, but they may also be the result of surgical mistakes or incorrect treatment techniques⁷. In this study, carried out at the Institute of Science and Veterinary Medicine in Dalaba, the therapeutic evaluation of *C. asiatica* macerate in the repair and recovery of surgical wounds caused by this type of operation involving dogs was conducted.

MATERIALS AND METHODS

Geographical location and population

Dalaba is one of the three Prefectures belonging to the Administrative Region of Mamou. It is located between 45' and 11°35' north latitude and between

10°21' and 12°16' west longitude, at an altitude ranging from 600 to 1,425 m. Its surface area is 5,750 square kilometres with a population of 133,677; a density of 23.25 inhabitants per km² (RGPH3/2014).

It is bounded:

- To the east by the Mamou and Tougué Prefectures;
- To the west by the Prefecture of Pita;
- To the north by the Prefecture of Labé;
- To the south by the Prefecture of Kindia

Survey of managers and analysis of archives

This survey was carried out by contacting a number of local executives. These exchanges were devoted to the recognition and existence of *C. asiatica* in the locality and its level of use by the actors; finally the analysis of the archives was carried out in order to obtain numerical data relating to the subject.

Survey of pet owners

With bitch breeders, a discussion was held on the practice of ovariohysterectomy and its importance for the lives of the animals and their owners.

Harvesting the plant

The harvest was carried out in the morning at the plant site of *C. asiatica*. The crop was harvested and placed in a plastic bag. The material was weighed in the preparation room using a Roberval balance.

Preparation of the galenic form (macerate) of *C. asiatica*

The maceration was carried out immediately after harvesting, by disinfecting the preparation instruments, mounding and disinfecting the leaves and stems with chlorinated water, then proceeding to rough division followed by grinding. The resulting grind was macerated in a plastic container, followed by the addition of drinking water and a 3-day incubation period at room temperature. Filtration was then carried out using a 2 mm mesh sieve over a 0.5 mm special funnel. The resulting product was stored at room temperature.

Establishing the experimental nucleus

Subjects were then divided into two batches of 6 animals: batch 1 served as control and batch 2 was treated with the extract.

Practice of ovariohysterectomy

The operation was carried out using the method described by Axel Schönfelder al. 2006⁸.

Application of the macerate to the surgical wound

The macerate was applied at a dose of 10 drops, twice a day for 2 weeks. Before applying the macerate, the wounds were cleaned with distilled water and then dried with absorbent paper.

Statistical analysis

The data were processed using Microsoft Excel. Analysis of the data was carried out with SPSS version 20 to determine the means and standard error of the means. The statistically significant differences of the groups were analysed by ANOVA at $p < 0.05$.

RESULTS

Survey of managers and analysis of archives

A survey of managers revealed that *C. asiatica* can be found in the Urban Commune of Dalaba, but has never been studied in the locality. Some actors reported that it has many therapeutic properties (pro-healing of wounds and burns, antiseptic and for animals).

Survey of traditional therapists

According to these traditional practitioners, the use of the plant's leaves and stems as an aqueous macerate or poultice on surgical wounds and burns is an excellent healing agent. They have also found it to be an effective remedy for gastritis and gynaecological infections.

Farmers' survey

In order to assess the use of *C. asiatica* and the practice of ovariohysterectomy on bitches, we carried out surveys in the various localities where the breeders are located. The results show that, of the ten breeders surveyed, seven are well informed about the plant and its therapeutic properties, while two have no knowledge of it. Only one breeder was aware of the practice of ovariohysterectomy.

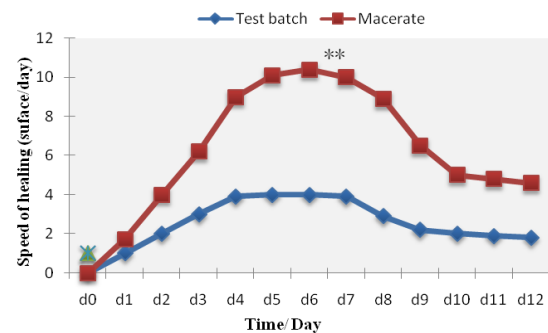


Figure 1: Healing speed of wounds treated with the extract.

Application of *C. asiatica* macerate and speed of wound healing

The aqueous maceration extract is made and obtained to enable the extraction of water-soluble principles such as tannins and most of the flavonoids contained in *C. asiatica*. The healing rate of wounds treated with the extract is shown in Figure 1.

DISCUSSION

In this study, the curative activity of *C. asiatica* against post-operative complications in bitches after ovariohysterectomy was evaluated. Present work shows that ovariohysterectomy is a very widespread surgical procedure in veterinary medicine in the urban district of Dalaba. Nevertheless, it is sometimes accompanied by intra- and post-operative complications. The main active compounds in *C. asiatica* include triterpenoid saponins, particularly madecassoside, asiaticoside, madecassic acid and asiatic acid⁹⁻¹¹. A number of clinical studies have been conducted on the plant's anti-inflammatory and antinociceptive activity in animal models¹²⁻¹⁴. Current research has shown that the plant has curative potential. This was reflected not only in a reduction in the duration of the inflammatory phase of the wound but also, macroscopically. In practice, these tissues, formed

of a stratified layer that restores the barrier function of the epithelium, protect the wound against attacks from external agents.

C. asiatica contains numerous phenolic components, in particular flavonoids (including catechin, epicatechin, kaempferol, quercetin and related glycosides). It contains chlorogenic acids, a diverse group of compounds formed by quinic acid esterified into derivatives of cinnamic acid¹⁵. Hydroxycinnamic esterified flavonoids, such as castilliferol and castillicetin (quercetin-3-caffeate), have been identified using aqueous methanol concentrates from the plant¹⁶. The common pentacyclic triterpenoids, namely asiaticoside and madecassoside, as well as the associated acids, and the aglycones, have all been extensively researched and are currently recognised as *C. asiatica*'s essential active components¹⁷. The presence of these constituents and others not yet mentioned in the study could also play an important role in this repair activity.

Limitations of the study

The study should also cover the treatment of wounds in other animal species, taking into account vascular metabolic imbalance and nutritional deficiency. An *in vivo* study would be necessary, however, to assess the efficacy of the macerate in other subjects.

CONCLUSIONS

The application of *C. asiatica* macerate to post-operative wounds in bitches has shown good clinical applicability, with anti-inflammatory activity and accelerated healing. The therapeutic potential of the plant is thought to be attributable to its most important bioactive components. The study argues that *C. asiatica* could be a better alternative for surgical wound closure.

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AUTHOR'S CONTRIBUTION

SOROMOU LW: conceptualization and project administration. **Lolahara G:** initial draft of the manuscript. **KPOULOMOU C:** quantitative and qualitative data analysis and interpretations. All authors revised the article and approved the final version.

DATA AVAILABILITY

Data will be made available on request.

CONFLICT OF INTEREST

Regarding this study, there is no conflict of interest.

REFERENCES

- Diwan PV, Karwande I, Singh AK. Anti anxiety profile of manduk pami *C. asiatica* in animals. *Fitoterapia* 1991; 62(3): 253-257.
- Lee Y, Choi HK, N'deh KPU, *et al.* Inhibitory effect of *C. asiatica* extract on DNCB-induced atopic dermatitis in HaCaT cells and BALB/c Mice. *Nutrients* 2020; 12(2):411. <https://doi.org/10.3390/nu12020411>
- Lokanathan Y, Omar N, Ahmad Puzi, NN, Saim A, Hj Idrus R. Recent updates in neuroprotective and neuroregenerative potential of *C. asiatica*. *Malays. J Med Sci* 2016; 23:4-14.
- Hashim P, Sidek H, Helan MH, *et al.* Triterpene composition and bioactivities of *C. asiatica*. *Molecules* 2011; 16:1310-1322. <https://doi.org/10.3390/molecules16021310>
- Lee HN, Shin SA, Choo GS, *et al.* Anti-inflammatory effect of quercetin and galangin in LPS-stimulated RAW264.7 macrophages and DNCB-induced atopic dermatitis animal models. *Int J Mol Med* 2018; 41 :888-898. <https://doi.org/10.3892/ijmm.2017.3296>
- Gohil KJ, Patel JA, Gajjar AK. Pharmacological review on *C. asiatica*: A potential herbal cure-all. *Indian J Pharm Sci* 2010;72(5):546-56. <https://doi.org/10.4103/0250-474x.78519>
- Julie D. Contribution to learning about oophorectomy: study of complications in 73 cats. Thesis presented and publicly defended before the Paul-Sabatier University of Toulouse. Year 2012 Thesis: 2012 - TOU 3 - 4060.
- Schönfelder A, Muder J. Ovariohysterectomy in cows. *The Veterinary Point n° 268* of 01/09/2006.
- Hamid K, Ng I, Tallapragada VJ, Váradi L, *et al.* An investigation of the differential effects of ursane triterpenoids from *C. asiatica*, and their semisynthetic analogues, on GABAA receptors. *Chem Biol Drug Des* 2016; 88 (3): 386-397. <https://doi.org/10.1111/cbdd.12766>
- Sultan RA, Mahmood SBZ, Azhar I, Ahmed SW, Mahmood ZA. Biological activities assessment of *C. asiatica* (Linn.). *J Herbs Spices Med Plants* 2014; 20 (3): 319-327. <https://doi.org/10.1080/10496475.2013.869521>
- Hashim P, Sidek H, Helan MHM, *et al.* Triterpene composition and bioactivities of *C. asiatica*. *Molecules* 2011; 16 (2):1310-1322. <https://doi.org/10.3390/molecules16021310>
- Xiao Y, Akatvipat A, Mongkolrat N, *et al.* Analgesic and anti-inflammatory effects of oral *C. asiatica* (L.) urban extract in cats undergoing ovariohysterectomy. *Phytomed Plus* 2023;3(1):1-7
- Huang SS, Chiu CS, Chen HJ, Hou WC, Sheu MJ, Lin YC, Shie PH, Huang GJ. Antinociceptive activities and the mechanisms of anti-inflammation of asiatic acid in mice. *Evid Based Complement Alt Med* 2011. <https://doi.org/10.1155/2011/895857>
- Rotpenpian N, Arayapisit T, Roumwong A, *et al.* A standardized extract of *C. asiatica* (ECa 233) prevents temporomandibular joint osteoarthritis by modulating the expression of local inflammatory mediators in mice. *J Appl Oral Sci* 2021; 29. <https://doi.org/10.1590%2F1678-7757-2021-0329>
- Ncube EN, Steenkamp PA, Madala NE, Dubery IA. Chlorogenic acids biosynthesis in *C. asiatica* cells is not stimulated by salicylic acid manipulation. *App Biochem Biotech* 2016 ; 179: 685-696. <https://doi.org/10.1007/s12010-016-2024-9>
- Subban R, Veerakumar A, Manimaran R, Hashim KM, Balachandran I. Two new flavonoids from *C. asiatica* (Linn.). *J Natural Med* 2008; 62: 369-373.
- Agarwal R, Diwanay S, Patki P, Patwardhan B. Studies on immunomodulatory activity of *Withania somnifera* (Ashwagandha) extracts in experimental immune inflammation. *J. Ethnopharmacol* 1999; 67: 27-35. [https://doi.org/10.1016/s0378-8741\(99\)00065-3](https://doi.org/10.1016/s0378-8741(99)00065-3)