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## RESEARCH

### Plantas medicinais utilizadas na cicatrização de feridas por agricultores da região sul do RS

Medicinal plants used in the process of wound healing by growers in the south region of the RS state

Plantas medicinales usadas em la cicatrización de heridas por agricultores de la región sur de RS

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### ABSTRACT

**Objective:** To report the plants used by growers in the South region of the Rio Grande do Sul State, during the process of wound healing. **Method:** It is a descriptive research that analyzed qualitative data, conducted with 31 growers in the South region of the Rio Grande do Sul State. The data were collected between January 2009 and July 2010, through semi-structure interviews and simple observation, with photographic records of medicinal plants and georeferencing. The data were analyzed comparing the information cited through scientific studies. **Results:** 34 plants used in wound healing were cited. Among them, 24 were quoted in studies due to having healing, anti-inflammatory, antimicrobial and analgesic potentials that can be associated to the healing process. **Conclusion:** This study showed that 86% of plants cited by growers are in accordance with the research that was made in the scientific literature, which emphasizes the importance of health professionals in stimulating the use of medicinal plants with attested effect. **Descriptors:** Medicinal plants, wound healing, Complementary therapies, Nursing.

### RESUMO

**Objetivo:** Relatar as plantas utilizadas por agricultores da região Sul do Rio Grande do Sul, no processo de cicatrização de feridas. **Método:** Pesquisa descritiva que analisou dados qualitativos, realizada com 31 agricultores da região Sul do Rio Grande do Sul. Os dados foram coletados entre janeiro de 2009 e julho de 2010, através da entrevista semiestruturada, observação simples, com registro fotográfico das plantas medicinais e georeferenciamento. Os dados foram analisados comparando as informações citadas com estudos científicos. **Resultados:** Foram citadas 34 plantas utilizadas na cicatrização de feridas. Dentre elas, 24 foram referenciadas em estudos por terem potenciais cicatrizante, anti-inflamatório, antimicrobiano e analgésico que podem ser associados à cicatrização. **Conclusão:** Este estudo mostrou que 86% das plantas citadas pelos agricultores estão condizentes com a pesquisa feita na literatura científica, destacando a importância dos profissionais de saúde em estimular o uso das plantas medicinais com efeito comprovado. **Descritores:** Plantas medicinais, Cicatrização de feridas, Terapias complementares, Enfermagem.

### RESUMEN

**Objetivo:** Relatar las plantas utilizadas por agricultores de la región Sur de Rio Grande do Sul, en el proceso de cicatrización de heridas. **Método:** Investigación descriptiva que analizó datos cualitativos, realizada con 31 agricultores de la región Sur de Rio Grande do Sul. Los datos fueron recolectados entre enero de 2009 y julio de 2010, a través de la entrevista semi-estructurada, observación simples, con registro fotográfico de las plantas medicinales y geo-referencia. Los datos fueron analizados comparando las informaciones citadas con estudios científicos. **Resultados:** Fueron citadas 34 plantas utilizadas en la cicatrización de heridas. Entre estas para 24 fueron encontrados estudios con potencial cicatrizante, anti-inflamatorio, antimicrobiano y analgésico que pueden ser asociados a la cicatrización. **Conclusión:** Este estudio mostró que 86% de las plantas citadas por los agricultores está condiciente con la investigación hecha en la literatura científica, destacando la importancia de los profesionales de salud en estimular el uso de las plantas medicinales con efecto comprobado. **Descritores:** Plantas medicinales, Cicatrización de heridas, Terapias complementares, Enfermería.

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## INTRODUCTION

**M**edicinal plants are used and mentioned since prehistoric times in the process of wound healing, when plants and their extracts were used as poultices, with the purpose of stopping bleeding and facilitate healing, and many of these plants were ingested to operate in a systemic way.<sup>1</sup>

By perceiving the importance of medicinal plants, the World Health Organization (WHO) has encouraged and valued its use since the Alma-Ata Declaration, in 1978, when it was found that 80% of the world population makes use of plants or their preparations in health care procedures. Furthermore, for their safe use, in 2006 the National Policy for Integrative and Complementary Practices (PNPIC) was implemented in the Brazilian Unified Health System (SUS), thus inserting plants through phytotherapy, homeopathy and anthroposophical medicine.<sup>2</sup>

Currently, experimental studies based on medicinal plants and other elements acting in the healing process are being developed by reaffirming the important role of nurses in developing new technologies for the treatment of wounds.<sup>3</sup> Researches with cabbage leaves (*Brassica* sp.) should be cited as examples, which are being performed and can prove the benefits during the healing process, however, there are few clinical / pharmacological studies in human beings.<sup>4</sup> Nevertheless, even with this difficulty, there are already some products on the market derived from plants, for medicinal purposes, such as Biocure®, which is a product consisting of biomembrane, impermeable, derived from polyisoprene, originated from vegetable latex of rubber trees, which has indication to treat chronic wounds of difficult healing.<sup>5</sup>

The use of complementary therapies is growing for their easy access and because they are less harmful to the body when compared to allopathic medicine.<sup>6</sup> The biomedical model, for having a predominantly physical and fragmented approach, which gives emphasis on specialties, has been criticized for not assisting the individual in its wholeness. Furthermore, due to use highly complex technologies, it makes access more difficult for the large part of the population.<sup>7</sup>

Therefore, it is considered that allopathic medicine, for giving little appreciation to sociocultural context, popular skills and practices of care, hinders the self-perception of the person in relation to its health condition, as well as the construction of autonomy in making decisions.

The empirical knowledge is often ignored, despite researches on medicinal plants that starts from the popular knowledge are demonstrating that excellent results can be obtained<sup>8-9</sup>, because it is known that population did not begin to use the plants by chance, without have occurred the indication of someone, testing or improvement of a certain symptom.

In Brazil, the inclusion of complementary therapies has been encouraged, thus providing opportunities for their expansion and effectiveness in the SUS scope and seeking to offer an integral care.<sup>10</sup> It is essential that health professionals value the popular knowledge, because studies like these show us that these therapies have been researched and encouraged, thus becoming a new resource and option for the accomplishment of care and allowing health professionals to insert these therapies in their workplaces, which might be a complement to treatments of various pathologies, including in relation to the process of wound healing.

In light of the foregoing, this paper aims at reporting the plants used by growers in the South region of the Rio Grande do Sul State, during the process of wound healing.

## METHOD

It is a descriptive research that analyzed qualitative data, linked to the project "*Bioactive plants for human use by families of eco-friendly growers in the South region of the RS*", which was developed by the Faculty of Nursing at the Federal University of Pelotas and by the Embrapa Temperate Climate.

The study population consisted of 31 subjects, who were growers living in rural areas of the cities of Pelotas, Morro Redondo, Canguçu, Arroio do Padre and Rio Grande, South region of the Rio Grande do Sul State. The selection of subjects was based on snowball sampling methodology<sup>11</sup>, through which the coordinator of the association of street marketers in Pelotas indicated growers who were experts in medicinal plants, besides a community health agent (CHA) of a basic health unit in Rio Grande. The data collection took place from January 2009 to July 2010, alongside the homes of families. The techniques of semi-structured interview and simple observation were used as instruments, with photographic records and georeferencing of medicinal plants, actions conducted via Global Positioning System (GPS). The interview made questions about the profile of subjects, use of medicinal plants in the care of individual and family health, in addition to information about the way in which such knowledge is conveyed. During the interviews, the participants were not asked about specifications with regard to wounds (acute or chronic); they were questioned only about the use of plants in wound healing.

Georeferencing was used in order to identify the location of the surveyed plants, which allows another researcher to accurately return to a particular plant. Furthermore, photographic records and collection of exsiccates were performed for some medicinal plants, which were identified by a botanist linked to the Embrapa Temperate Climate.

According to the chosen methodological approach, the data were analyzed by means of the following steps: description of the context of the study subjects and elaboration of the profile of the interviewees; transcription of the interviews and reading of field diary.

The interviewed growers have cited 341 medicinal plants, which were organized on a table in database containing the following information: popular and scientific name of the plant, indication, plant part to be used, method of preparation and dosage of use. From these data, a table (scientific name, family, popular name and mentioned use by subjects)

with medicinal plants cited for wound healing was elaborated. Subsequently, the aforementioned information was compared with pharmacological, phytochemical and ethnobotanical studies.

To that end, searches were conducted in literature, topic-related books and studies available in LILACS (Latin American and Caribbean Health Science Literature), in SciELO (Scientific Electronic Library Online) and in PubMed (Public Medline) about cited medicinal plants with antimicrobial, anti-inflammatory, analgesic and wound healing effects. Searches were held by the scientific name of each cited medicinal plant.

This research has respected the COFEN Resolution 311/2007<sup>12</sup>, of the Code of Ethics for Nursing Professionals, and the Resolution 196/96<sup>13</sup> of the National Health Council from the Brazilian Ministry of Health. All subjects signed a Free and Informed Consent Form (FICF). The project received approval of the Research Ethics Committee from the Faculty of Medicine at the Federal University of Pelotas (072/2007).

## RESULTS AND DISCUSSION

The study population consisted of 31 growers, of whom 26 were females. Their ages ranged from 12 to 90, and the Catholic and Lutheran religions were prevalent. Regarding the schooling level, three were illiterate, 21 had incomplete elementary school, four had complete elementary school and three participants were attending school, and of these, most reported not want to continue working on the rural property, but rather practice another profession.

The interviewed growers have cited 341 medicinal plants, of these, 34 were reported as effective in the process of wound healing. Among the 34 plants, for six it was not possible to obtain a taxonomic identification, because, during the data collection, some plants had no fruit and/or flowers, which made it difficult to identify them, thus preventing the taxonomic classification. For this reason, such herbs were not included in the study, and they are popularly cited as: *bálsamo-do-peru*, *planta-da-alemanha*, *pitoco*, *carniceira*, *erva-paraguaia e malva (mallow)*.

Thus, this paper aims at discussing the 28 medicinal plants that were mentioned in clinical/pharmacological studies (Table 1).

Table 1 - Medicinal plants referred by growers in wound healing. Pelotas, Rio Grande do Sul, Brazil, 2012.

Scientific name	Family	Popular name	Use mentioned by interviewees
<i>Acanthospermum australe</i>	Asteraceae	Bur	For wound healing.
<i>Allium sativum</i>	Alliaceae	Garlic	Cuts and external infections.
<i>Aloe arborescens</i>	Asphodelaceae	Aloe	Burns, infected wounds, healing wounds and stopping bleeding.
<i>Aloe saponaria</i>	Asphodelaceae	Soap aloe	Treatment of wounds.
<i>Alternanthera dentata</i>	Amaranthaceae	Josephs coat	Treating external infections, cuts and injuries.
<i>Arctium lappa</i>	Asteraceae	Greater	Provides improvement of

		burdock	wounds.
<i>Aspilia montevidensis</i>	Asteraceae	Daisy	Treating cracks in the skin and acting as healing.
<i>Baccharis glutinosa</i>	Asteraceae	Mule fat	Treating cuts, healing.
<i>Bidens alba</i>	Asteraceae	Butterfly needles	Healing wounds.
<i>Bidens pilosa</i>	Asteraceae	Beggar-ticks	Healing wounds.
<i>Chenopodium ambrosioides</i>	Amaranthaceae	Mexican tea	It is one of the components for producing ointment for wounds.
<i>Citrus sinensis</i>	Rutaceae	Orange	Treating wounds.
<i>Fragaria vesca</i>	Rosaceae	Strawberry	Treating wounds.
<i>Heterothalamus</i> sp.	Asteraceae	*	Washing wounds.
<i>Hydrocotyle bonariensis</i>	Araliaceae	Largeleaf pennywort	Healing wounds.
<i>Malva parviflora</i>	Malvaceae	Mallow	Healing wounds.
<i>Malva sylvestris</i>	Malvaceae	Mallow	Washing wounds.
<i>Opuntia</i> sp.	Cactaceae	Cactus	Healing (burns).
<i>Pelargonium odoratissimum</i>	Geraniaceae	Apple geranium	Washing wounds.
<i>Persea americana</i>	Lauraceae	Avocado	Healing wounds.
<i>Persea americana</i>	Lauraceae	Avocado tree	Healing wounds.
<i>Plantago</i> sp.	Plantaginaceae	Ribwort	Washing wounds.
<i>Salix humboldtiana</i>	Salicaceae	Pencil willow	Healing wounds.
<i>Sedum dendroideum</i>	Crassulaceae	False Hens-and-Chickens	Used in treatment of wounds (due to rusty nail) and for wound healing.
<i>Solidago</i> sp.	Asteraceae	Arnica	Wounds, injuries and bruises.
<i>Symphytum officinale</i>	Boraginaceae	Comfrey	Cleaning wounds and healing.
<i>Tanacetum vulgare</i>	Asteraceae	Tansy	Treating injuries in the skin and healing wounds.
<i>Xanthium</i> sp.	Asteraceae	Bur	Treating wound infections.

The healing process is composed of four phases: inflammation, reconstruction, epitheliazation and maturation. Inflammation is characterized by non-specific local reaction to tissue injury or bacterial invasion. The second phase, reconstructive, or also called proliferative, regenerative or fibroblastic presents the development of granulation tissue as its main characteristic.<sup>14</sup> In epitheliazation, the wound remains covered by epithelial cells, the macrophages release epidermal growth factor (EGF) that stimulates the proliferation and migration of these cells.<sup>15</sup> And, finally, the maturation stage takes place, in which there is progressive reduction of vascularization and fibroblasts, in addition to occurring increased tensile strength and reorientation of collagen fibers.<sup>14</sup>

The nurse professional is responsible for several related to wound healing care, and constantly seek strategies for prevention and assessment, as well as methods for treating them, with the aim at healing without complications and impairments.<sup>16</sup> The act of providing an effective care to the user with wounds is a challenge for the whole multiprofessional staff, but especially for nurses, because they perform the multidimensional care that goes beyond the simple technique of performing dressings.<sup>17</sup>

A holistic view of the nursing professional associated with complementary practices plays a crucial role in hospitals, basic health units (BHU) and in the community at large. This professional must advice users on therapies that can act in a complementary manner in relation to drug treatment<sup>18</sup>, always considering the popular knowledge and scientific evidence about the topic.

In this study, of 28 plants mentioned by the subjects, 12 were cited in clinical and/or pharmacological studies due to their healing actions: *Persea americana*<sup>5</sup>, *Allium sativum*<sup>19</sup>, *Solidago* sp.<sup>20</sup>, *Aloe arborecens*<sup>21-22</sup>, *Opuntia* sp.<sup>23</sup>, *Xanthium* sp.<sup>24</sup>, *Symphytum*

*officinale*<sup>5-22</sup>, *Chenopodium ambrosioides*<sup>25</sup>, *Malva sylvestris*<sup>26</sup>, *Bidens Alba*<sup>27</sup>, *Bidens pilosa*<sup>28</sup> and *Plantago sp.*<sup>29</sup>

*Persea americana* is indicated for the treatment of non-infected open injuries, prevention of pressure ulcers, by promoting angiogenesis; maintains the humidity in the environment through linoleic acid and accelerates the granulation process.<sup>5</sup>

In a research conducted with mice aiming at evaluating the healing potential of *Allium sativum* with pure honey, the result showed that this combination facilitated and accelerated the process of wound healing.<sup>19</sup> Furthermore, *A. sativum* is indicated as an antiseptic agent by the Directors' Collegiate Resolution (DCR) 10/2010 of ANVISA, which is a list of notifications of vegetable drugs<sup>30</sup> that can help to maintain the wound clean, thus preventing infection and promoting the healing process.

An analysis concerning the effect of daily intra-peritoneal administration (14 days) of the aqueous extract of the aerial parts of *Solidago microglossa* showed that there was a significant reduction in the wound areas in mice, but the therapeutic dose was very close to lethal levels, thus demonstrating little safety in relation to its internal use.<sup>20</sup> This shows the need to know the dosage and the possible toxic effects that a medicinal plant can cause.

In Brazil, the cultivation and uses of *Aloe arborescens* are intended for the same purposes of *Aloe vera*. The mucilaginous juices of leaves of *A. vera* and *A. arborescens* have healing activity due to a polysaccharide called aloeferon, besides antimicrobial activity against bacteria and fungi, thus resulting in a phytotherapeutic agent formed by aloeferon and anthraquinones.<sup>22</sup> Results of a clinical study with *Aloe ferox* and *A. arborescens*, performed in mice and rabbits, showed that both preparations can ease the process of wound healing and, moreover, there was selective inhibition of microbial growth.<sup>31</sup>

A case study conducted with a diabetic and hypertensive user, with ischemic wound, showed that the use of *A. vera* with collagen resulted in the epitheliazation of the injury.<sup>3</sup> Some clinical researches show that preparations of Aloe gel (aloes) assist in wound healing, since the polysaccharides present in this plant stimulate the activity of macrophages and fibroblasts.<sup>21</sup>

The use of *A. vera* in the process of wound healing, both acute and chronic, is an inexpensive resource, easy to implement and accessible to users and health workers. Furthermore, it relieves pain, inflammation and performs debridement by absorbing exudate.<sup>32</sup>

The potential for healing wounds of two lyophilized extracts of polysaccharide existing in the cladodes of *Opuntia ficus* was assessed. These extracts were topically applied on wounds of large thickness in mice. Such application has accelerated re-epitheliazation and remodeling of wounds.<sup>23</sup>

The results of a study conducted in mice showed that the ethanolic extract of the dried fruit of *Xanthium strumarium* has topical anti-inflammatory and analgesic activity.<sup>33</sup> The hydrophilic extract of *Xanthium cavanillesii* has been validated as an active component in the healing process.<sup>24</sup>

Pharmacological studies show that *Symphytum officinale* has allantoin (substance with proven healing action), rosmarinic acid responsible for the anti-inflammatory action.<sup>22</sup> The external use of this plant is allowed to produce drugs through the DCR 17/2000

of ANVISA<sup>34</sup>, but its oral administration is prohibited by the Brazilian Ministry of Health and by agencies in other countries, due to toxicity.<sup>22</sup>

The ethyl ether extract of flowers of *Malva sylvestris* and *P. granatum* were used to assess the activity of wound healing at 200 mg/kg/daily dose in diabetic mice. The animals treated with ointment containing the mallow extract showed a significant reduction in wounded areas, when compared with the control group.<sup>26</sup>

The extract of *Bidens alba* used in open wounds in the dorsal region of mice proved to be effective in the healing process.<sup>27</sup> A research conducted in mice with extracts of *Bidens pilosa* and *Ocimum suave* has significantly increased wound healing in relation to control. Furthermore, the vegetable extracts have not left prominent scars in wound locations, but the same did not occur with the group treated with neomycin sulfate.<sup>28</sup>

Besides the aforementioned plants, the clinical studies about antimicrobial effects have mentioned more five: *B. glutinosa*<sup>35</sup>, *A. australe*<sup>36</sup>, *M. parviflora*<sup>37</sup>, *P. odoratissimum*<sup>38</sup> and *S. humboldtiana*<sup>39</sup>. The antimicrobial effect of certain substances can promote the repair of wounds of different origins, since the healing process is faster if the infection is in a lower degree<sup>40</sup>, which might be related to the indication of these plants in the healing process.

Regarding the plants *A. lappa*<sup>30</sup>, *T. vulgare*<sup>41</sup>, *H. bonariensis*<sup>42</sup> and *C. sinensis*<sup>43</sup>, studies showing anti-inflammatory activity were found. The plants *A. saponaria*<sup>44</sup> and *S. dendroideum*<sup>45</sup> showed anti-inflammatory and analgesic activity. As for the *F. vesca*, signs of analgesic activity were verified.<sup>46</sup>

Given these results, it is known that the bearer of wounds experiences many moments of pain due to its injuries. Pain is interconnected to stress and this influences in the process of wound healing, thus causing anxiety in individuals and reflecting on their quality of life.<sup>15</sup> Therefore, plants with analgesic and anti-inflammatory properties might help in the process of wound healing.

28 types of plants for wound healing were surveyed, and four of them (*A. saponaria*, *Heterothalamus sp.*, *A. montevidensis* and *A. dentata*) were not found in studies highlighting healing, anti-inflammatory, antimicrobial and analgesic activities. In light of the foregoing, it is possible to state that the knowledge of growers is 86% consistent with scientific knowledge.

It was noticed that the surveyed plants have evidence about the healing potential, but many studies are still limited because they do not report on what stages of this process the plants should be used to assist in the process of wound healing. In some works, only isolated components of the plants are surveyed, and not the crude extract, which hampers the indication of these plants during the healing process. Other plants have properties that might help by virtue of their antimicrobial, anti-inflammatory and analgesic effects. Furthermore, there are many clinical studies carried out in animals, which points out to the need to expand the application to research on human beings.

Consequently, the trained nurse in relation to the knowledge about plants, besides valuing the popular knowledge of the population, might use them as resources in nursing care, especially in the process of wound healing, thus making the care more human and meaningful for those who experience its shares.

## CONCLUSION

It is essential that nursing is constantly updated to meet the health needs of the population, which is a fact that requires appreciation for popular knowledge and its association of this with scientific knowledge on the part of nurses and health staff members. The nursing professional must seek to know the aspects related to wound assessment, treatment and prevention options, by taking into account users' access to dressings methods and coverage, their socioeconomic situations and cultural factors, thus seeking the accomplishment of a comprehensive care.

The medicinal plants for wound healing indicated by growers are 86% consistent with pharmacological/clinical studies, by demonstrating properties that can assist in this process. In light of these studies, it should be highlighted the importance of nurses and other health care professions in encouraging the use of medicinal plants with attested effects, but noting that this must be a relationship sustained by attitudes of respect to each other, thus considering the local culture and the subjectivity of each individual.

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