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Asteraceae with potential for use in native grasslands and forest fragments: a case study at Santa Rita Farm, Lages - SC

Asteraceae com potencial de uso em áreas de campos nativos e fragmentos florestais: estudo de caso na Fazenda Santa Rita, Lages – SC

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RESUMO

O objetivo deste estudo consistiu em avaliar o potencial de utilização das espécies presentes em áreas campestres e florestais localizadas na Fazenda Santa Rita, com cerca de 200 hectares, situada na região da Coxilha Rica, Lages – SC. Para o levantamento florístico foi adotado o método de coletas por caminhamento, no período de março de 2021 a dezembro de 2022. Os espécimes coletados em campo, todos férteis, foram catalogados e incorporados ao acervo do Herbário LUSC, da Universidade do Estado de Santa Catarina. Foram identificadas 110 espécies de Asteraceae. Para a etapa de verificação dos usos das espécies, foram pesquisados artigos científicos publicados em periódicos digitais disponíveis nos bancos de dados da Scielo, CAPES e Web of Science. Além disso, foram consultados livros impressos e artigos publicados em revistas específicas da área de botânica, para a seleção de trabalhos relevantes que tratavam sobre o potencial de uso de espécies de Asteraceae. As palavras-chave utilizadas na pesquisa foram: "uso econômico da Família Asteraceae", "Asteraceae de uso ornamental", "Asteraceae de uso medicinal", "Asteraceae de uso melífero e apícola", "Asteraceae de uso alimentício convencional e não convencional". Também houve a substituição do nome “Asteraceae” por “Compositae” em cada uma das utilidades, para localização dos artigos, bem como a análise individual das espécies, sendo, posteriormente, as mesmas avaliadas quanto ao seu potencial de uso. Das espécies confirmadas na área de estudo, 60 (54,55%) delas possuem informações sobre o uso, enquanto para as outras 50 (45,45%) espécies não foi possível localizar na literatura o seu potencial de uso. Essa pesquisa evidencia a necessidade de estudos básicos sobre espécies nativas e a importância de aprofundar o conhecimento sobre suas funcionalidades, para a manutenção dos ecossistemas, podendo oferecer diversas aplicações potenciais.

PALAVRAS-CHAVE: bioatividade vegetal; campos de altitude; compositae; espécies nativas; pastagens naturais; usos econômicos.

ABSTRACT

The objective of this study was to assess the potential for use of species present in grassland and forest areas located in the Fazenda Santa Rita, with about 200 hectares, located in the Coxilha Rica region, Lages - SC. For the floristic survey, the walking collection method was adopted, from March 2021 to December 2022. Fertile specimens collected in the field were cataloged and incorporated into the LUSC Herbarium, at the University of the State of Santa Catarina. 110 Asteraceae species were identified. For the species use verification stage, scientific articles published in digital journals available in the Scielo, CAPES, and Web of Science databases were searched. In addition, printed books and articles published in specialized botanical journals were consulted to select relevant works on the potential use of Asteraceae species. The keywords used in the research were: "economic use of the Asteraceae family", "Asteraceae for ornamental use", "Asteraceae for medicinal use", "Asteraceae for honey and beekeeping use", "Asteraceae for conventional and non-conventional food use". The name "Asteraceae" was also replaced by "Compositae" in each of the uses, to locate the articles, as well as the individual analysis of the species, which were subsequently evaluated for their potential use. Of the species confirmed in the study area, 60 (54.55%) have information on their use, while for the other 50 (45.45%) species, it was not possible to locate their potential use in the literature. This research highlights the need for basic studies on native species, and the importance of deepening knowledge about their functionalities for the maintenance of ecosystems, which could offer a variety of potential applications.

KEYWORDS: plant bioactivity; high-altitude grasslands; compositae; native species; natural pastures; economic uses.

INTRODUCTION

Brazil is globally renowned for its rich biodiversity, comprising 52,160 species, particularly in its flora, which includes 1,617 species of Bryophytes, 1,411 Ferns and Lycophytes, 116 Gymnosperms, and 35,819 Angiosperms (FLORA E FUNGA DO BRASIL 2023). Among the most biodiverse families, Asteraceae stands out with about 327 genera and 2,214 species, found throughout Brazil from north to south, distributed across all phytogeographic domains. Amazon rainforest, Caatinga scrubland, Cerrado savanna, Atlantic Forest, Pampas grasslands, and Pantanal wetlands, with many known uses and others still largely unexplored.

Asteraceae have a worldwide distribution, dominating arid, semi-arid, and mountainous vegetation types, but are absent or poorly represented in tropical rainforests (MATZENBACHER 2009). In the high-altitude grasslands of southern Brazil, Asteraceae are notable for their significant taxonomic diversity and dominance in the floral composition, with endemic species being very common. One of the most prominent botanical families in natural formations, alongside Poaceae and Fabaceae, exhibiting diverse habits and biological forms (BOLDRINI et al. 2009).

Generally, Asteraceae thrive in diverse soil types, including shallow and nutrient-poor soils. They are most diverse in grasslands and exhibit a wide range of growth forms, from annual, biennial, or perennial herbs to subshrubs and shrubs, with trees and lianas being less common. Their stems are typically cylindrical, rarely winged, and some species produce latex (ROQUE et al. 2017). They have rosette leaves, alternating, opposite, or alternating-opposite, which can be simple or whorled, though less commonly; often lobed or deeply divided, rarely compound, without stipules. The flowers are arranged in heads, either solitary at the tip of the flower stalk or, more commonly, in clusters of varying sizes. The fruits are cypselas, with a beaked or truncated apex. The calyx composed of a pappus with 1(2) to multiple rows of bristles. The seeds lack endosperm and have a straight embryo (ROQUE et al. 2017).

Asteraceae plants are used worldwide in folk cultures, primarily for medicinal, culinary, agricultural, and ornamental purposes (ROQUE & BAUTISTA 2008), as well as in the production of beverages, spices, sweeteners, flavorings, food colorings, insecticides, cosmetics, perfumes, resins, dyes, varnishes, paints, soaps, and detergents (KUBITZKI et al. 2007, SIMPSON 2006).

According to KINUPP & LORENZI (2014), conventional Food Plants (CFP) encompass species with one or more edible parts for human consumption, including salt substitutes, sweeteners, colorants, spices, seasonings, beverages, tonics, and infusions. Moreover, many of these plants can be classified as Unconventional Edible Plants (UEPs), as they have edible parts that are not widely known or commonly used in human diets. The term PANC, coined by KINUPP (2007), refers to all plants, whether wild or cultivated, native or exotic, that have one or more edible parts but are not typically included in our everyday diet.

Asteraceae also stand out for their potential medicinal uses. Medicinal plants contain therapeutic substances or precursors for drug synthesis in their various parts, including leaves, stems, flowers, and roots (NETO & SIMÕES 2010). These compounds are referred to as "active ingredients," as described by MARTINEZ et al. (2015).

Since ancient times, medicinal plants have been employed to treat various illnesses and health conditions (SILVA et al. 2013). They contain various active compounds that can be used in drug manufacturing or consumed directly as teas, infusions, or other preparations (CARVALHO 2015).

Another significant potential of Asteraceae lies in their role in honey production, providing nectar and pollen for bees, as highlighted by DEMARTELAERE et al. (2010). Understanding bee-friendly plants and their nectar-producing potential is crucial for sustainable beekeeping and species conservation, as stated by SODRÉ et al. (2008).

Many nectar-rich plant species also have ornamental qualities, making them attractive for landscaping and gardening. According to Silva (2009), ornamental plants are cultivated for their beauty, having been selected over time for visually appealing features such as showy flowers, colorful and textured foliage, distinctive stems, or an overall attractive appearance.

The study of Asteraceae is crucial, both for its economic applications and ecological significance. With their herbaceous-shrubby habit, these plants play a significant role in the composition of natural grasslands surrounding forest fragments. The study aimed to identify economically valuable Asteraceae species in the Coxilha Rica region, based on existing literature, given the family's prevalence in this vegetation type.

MATERIAL AND METHODS

Study area

The studied area, Santa Rita Farm, spanning approximately 200 hectares, is situated in the Southern Santa Catarina Plateau region, at an elevation of 900 meters above sea level, with coordinates 27°48'58"S and 50°19'34"W. Located in Morrinhos, part of the vast Coxilha Rica region, spanning approximately 1,136.5 square kilometers with a perimeter of 249.25 kilometers (POLÊSE et al. 2015). This region is situated in the interior of Santa Catarina state, near the border with Rio Grande do Sul state. It spans across the municipalities of Lages (which covers 43%, the largest territorial percentage), Painel, São Joaquim, and Capão Alto (FERRARO 2020), as shown in Figure 1.

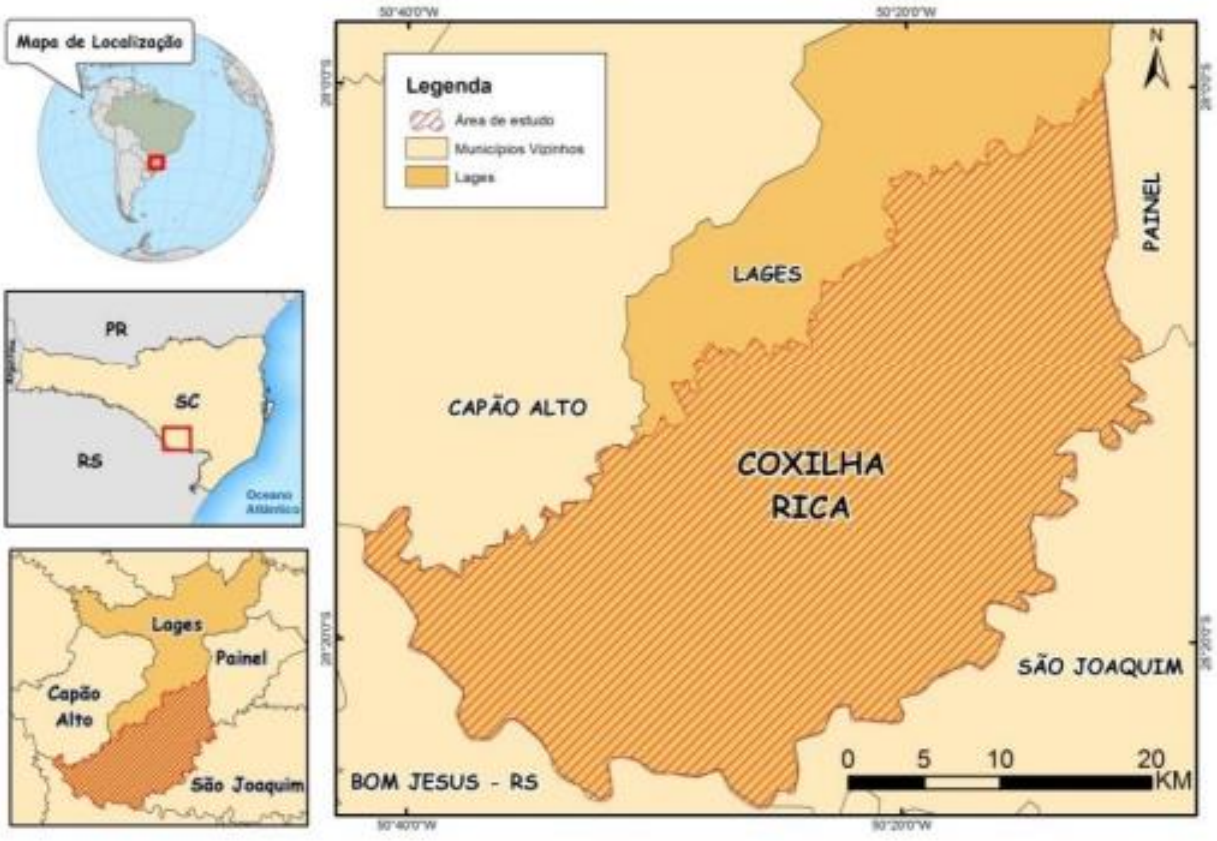

Figure 1. Map of the Coxilha Rica area on the southern plateau of Santa Catarina.
Figure 1. Map of the Coxilha Rica area in the Southern Plateau of Santa Catarina. (POLÊSE 2014).

High-altitude grasslands, such as those found in the Santa Catarina Plateau, are relatively well-preserved remnants associated with the Atlantic Forest in the state (BRASIL 2006, IBGE 2012), comprising a vast area of natural grasslands and remnant Araucaria forests (DETZEL 2010), featuring Mixed Ombrophilous Forest formations.

Fields, as defined by CONAMA (2008), are vegetation typical of mountainous and high-altitude environments, with shrubby and/or herbaceous structures; they generally occur on rocky summits of high-altitude mountain ranges, and the predominant climate is subtropical or temperate.

In dry grasslands, herbaceous and shrubby vegetation dominates, characterized by tufted Poaceae, Asteraceae, and Fabaceae, leaving patches of bare soil. Meanwhile, wet meadows serve as vital transition zones between dry fields and wetland areas (BOND-BUCKUP 2008). In this transitional zone, sedges and rushes form the characteristic structure of wetlands. Additionally, we find forest islands, which are wooded areas scattered throughout the predominantly grassland landscape, notably featuring araucaria trees.

According to Köppen's climate classification, the Coxilha Rica Region has a humid subtropical climate, with average annual temperatures ranging from 10 ºC to 18 ºC. 2013). In winter, the area can experience lows of -10 ºC, with frequent frost and occasional snowfall (COUTINHO 2016).

ANTONIUTTI (2018) emphasized that extensive cattle ranching, focusing on grazing, is a primary activity in the mountainous region's fields, often accompanied by the common practice of burning after winter to promote spring regrowth. However, he noted that while certain collection areas in Fazenda Santa Rita were previously affected by frequent fires, this practice has been discontinued since 2015.

Santa Rita Farm currently operates as a cattle ranch, utilizing native grasslands for grazing. This practice has been ongoing for years, with regular mowing to remove plant species unsuitable for cattle consumption,

such as Senecio *brasiliensis* (Spreng.). Lees, which are toxic to cattle 2004).

Field and collection methodology

Sampling took place from March 2021 to December 2022, involving 14 field trips for botanical species collection and observation. Samples were collected from three distinct environments: dry grasslands, wet grasslands, and forest fragments surrounding the fields. However, for the compilation of the species table with potential uses and the list of species without documented uses, the data was combined without separating by environment.

The walking method was employed for the collections as described by FILGUEIRAS et al. (1994) through unsystematic walks across grasslands and forest fragments (from edges to interior), aiming to cover the largest area possible, collecting all flowering and/or fruiting specimens (fertile individuals) while also recording various characteristics of each plant (common and/or scientific name, location, flower color, presence of pollinators, size, among others). Field equipment included GPS, digital camera for photo documentation, pruning shears, small garden trowel, hand hoe, pruning saw, collection bags, masking tape, plant press, newspaper, cardboard, and straps for securing the press.

Material handling

The plant material was prepared in the field using standard herbarium techniques, as described by ROTTA et al. (2008), using presses made of cardboard sheets and interspersed newspapers, later tied with ropes. The specimens were then dehydrated in an oven at approximately 40°C for three days, with daily monitoring.

After drying, the plant material underwent botanical identification to determine its family, genus, and species, as well as its common name, using the following reference sources: Catarinense Flora (BARROSO & BUENO 2002, CABRERA & KLEIN 1989, CABRERA & KLEIN 1980, CABRERA & KLEIN 1975, CABRERA & KLEIN 1973, FREIRE et al 2011), Brazilian Asteraceae (ROQUE et al 2017), Flora of Brazil (GUTIÉRREZ & KILIPPER 2022, HEIDEN 2022, MONGE 2022), numerous articles with identification keys for Asteraceae, primarily focused on the Southern region of the country, and other bibliographic references.

The specimens were deposited in the Lages Herbarium collection at Santa Catarina State University (LUSC), housed in the Agricultural and Veterinary Sciences Center UDESC-CAV, as physical specimens. They will later be digitized and made available in the virtual collection.

Bibliographical survey of the potential uses of the species

Scientific articles published in digital journals available in Scielo, CAPES, and Web of Science databases were researched for the species identified in the field floristic survey to evaluate their potential uses. Additionally, printed books were consulted to identify relevant works. Various articles and books published between 1973 and 2023 were selected, covering Portuguese, English, and Spanish languages. The articles were searched using keywords related to the economic uses of the Asteraceae family, including ornamental, medicinal, honey production, conventional and unconventional food uses. The search also included the alternative family name "Compositae." Each species was analyzed individually. Subsequently, the articles were assessed for their potential applicability. For species not mentioned in the literature, a table was created outlining potential uses based on their distinctive characteristics.

The identified species were categorized into four groups based on their potential uses. Food Potential (FP), Medicinal Potential (MP), Beekeeping Potential (BP), and Ornamental Potential (OP). Species with only one use were categorized as exclusive, while those with multiple uses were classified as multi-purpose species.

RESULTS AND DISCUSSION

The field floristic survey identified 110 species. Of the analyzed species, 60 (54.55%) have documented uses with various potential applications. On the other hand, the remaining 50 species (45.45%) had no documented potential uses in the reviewed literature.

The identified species yielded a total of 83 potential uses, with some species having multiple applications, as shown in the table below (Table 1).

Table 1. Asteraceae Family Species with Potential Uses Observed at Santa Rita Farm, Lages - SC. FP – Food Potential MP – Medicinal Potential BHP – Beekeping Honey Potential OP – Ornamental Potential

Table 1. *Asteraceae Family Plants with Possible Applications Found at Santa Rita Farm, Lages, Santa Catarina FP–Food Prospects MP– Medicinal Potential. BHP –Beekeping Honey Potential OP– Ornamental Potential*

Scientific Name	Common Name	Uses	Author/year
Achyrocline alata (Kunth) DC.	Marcela from Brazil	Positive Mental Attitude	FREIRE et al. -2011
Achyrocline satureioides DC.	losna-de-mato, macela, macela-amarela, macela-do-campo	PA PM	BARÃO (2016), FREIRE et al. (2011), SILVA et al. (2013), HAEFFNER et al. (2012), DICKEL (2005)
Achyrocline vauthieriana DC.	marcela	Positive Mental Attitude	FREIRE et al. -2011
Aspilia montevidensis (Spreng.) Kuntze	mal-me-quer, mal-me-quer-amarelo	PM PO	BARÃO (2016), MENTZ et al. (1997), STUMPF et al. (2009 a), CEOLIN (2009)
Baccharis aliena (Spreng.) Joch. Müll.	alecrim-do-campo	PO	BARROSO & BUENO (2002), HEIDEN (2022), STUMPF et al. (2009 a)
Baccharis anomala DC.	cambará-de-cipó	PM	BARROSO & BUENO (2002), BARÃO (2016)
Baccharis articulata (Lam.) Pers.	carqueja, carqueja-miúda, carqueja-do-morro, carqueja-branca, carqueja-doce, carqueijinha, vassoura	PM PO	BARROSO & BUENO (2002), GREGORY et al. (2019), STUMPF et al. (2009), BARÃO (2016), MENTZ et al. (1997), HAEFFNER et al. -2012
Baccharis crispa Spreng.	carqueja, carqueja-crespa, carqueja-verdade, carqueja-amarga, vassourinha	PM	SILVA et al. (2013), BARÃO (2016), BARROSO & BUENO (2002), MENTZ et al. (1997), HAEFFNER et al. (2012), LORENZI & MATOS (2008)
Baccharis dracunculifolia DC.	vassourinha, alecrim-do-campo, alecrim-vassoura	PM Positive Mental Attitude	BARROSO & BUENO (2002), SILVA et al. (2013), BARÃO (2016), OLIVEIRA-LIMA et al. -2019
Baccharis erioclada DC.	vassoura-lageana	PM	BARBOSA et al. (2023), BARROSO & BUENO (2002)
Baccharis microcephala (Less.) DC.	carqueja, cambará	PM	BARROSO & BUENO (2002)
Baccharis ochracea Spreng.	vassoura-do-campo, carqueja, erva-santa	PO	MENTZ et al. (1997), BARROSO & BUENO (2002), STUMPF et al. (2009 a)
Baccharis pentaptera DC.	carqueja	PM	BARROSO & BUENO (2002)
Baccharis uncinella DC.	vassoura, vassoura-lageana, óleo-de-vassoura	PM	SILVA et al. (2013), BARROSO & BUENO (2002)
Baccharis vincifolia Baker	carqueja	PM	BARROSO & BUENO (2002)
Baccharis vulneraria Baker	erva-santa	Positive Mental Attitude	BARROSO & BUENO (2002)
Bidens pilosa L.	carrapicho, carrapicho-de-agulha, picão, picão-preto	PM PA	BARÃO (2016), KELEN et al. (2015), MENTZ et al. (1997), CEOLIN (2009)
Campuloclinium macrocephalum (Less.) DC.	eupatório, erva-pompom, eupatório-roxo	PM PO	BARBOSA (2017), CABRERA & KLEIN (1989), STUMPF et al. (2009 a), VEGA et al. -2008
Chaptalia integerrima (Vell.) Burkart	Língua-de-vaca	PM PO	CABRERA & KLEIN (1973), HATTORI & NAKAJIMA (2011)

Chaptalia nutans (L.) Pol.	costa-branca, língua-de-vaca, arnica	PM PA	BARÃO (2016), CABRERA & KLEIN (1973), MENTZ et al. (1997), CEOLIN (2009), GREGORY et al. -2019
Chevreulia acuminata Less.	marcelinha	Positive Mental Attitude	FREIRE et al. -2011
Cirsium vulgare (Savi) Ten.	cardo, cardo-negro, cardo-de-costela, cardo-santo, cardo-de-espinho	PA PM Positive Mental Attitude	CARVALHO (2006), BARBOSA (2009), BARÃO (2016), GUTIÉRREZ & KILIPPER (2022)
Conyza bonariensis (L.) Cronquist	buva, erva-lanceta, rabo-de-fogete	PM PA	BARÃO (2016), KELEN et al. (2015), GREGORY et al. -2019
Conyza canadensis (L.) Cronquist	buva, erva-lanceta, rabo-de-fogete	PM PA	BARÃO (2016), KELEN et al. (2015), GREGORY et al. -2019
Elephantopus mollis Kunth	erva-grossa, pé-de-elefante, suçuaia, erva-grossa, erva-colégio, fumo-bravo	PM	BARÃO (2016), KELEN et al. (2015), GREGORY et al. -2019
Eupatorium bupleurifolium DC.	eupatório, charruá-grande	PO	LEAL & BIONDI (2006)
Eupatorium tanacetifolium Gillies ex Hook. & Arn.	eupatório	PM	CABRERA & KLEIN (1989), ROZENBLUM et al. -1988
Facelis retusa (Lam.) Sch. Bip.	macelinha	Positive Mental Attitude	BARÃO (2016), FREIRE et al. -2011
Gamochaeta americana (Mill.) Wedd.	vira-vira	PM Positive Mental Attitude	FREIRE et al. -2011
Gamochaeta simplicicaulis (Willd. ex Spreng.) Cabrera	-	Positive Mental Attitude	FREIRE et al. -2011
Hypochaeris chillensis (Kunth) Britton	almeirão-do-campo, chicória-do-campo, radite	PM PA	SILVA et al. (2013), GREGORY et al. (2019), KELEN et al. -2015
Hypochaeris radicata L.	almeirão-do-campo, almeirão-roseta, leituga	PM PA	GONÇALVES-AZEVEDO & MATZENBACHER (2007), GREGORY et al. -2019
Lessingianthus brevifolius (Less.) H. Rob.	Alecrim-do-campo	PO	CABRERA & KLEIN (1980)
Lucilia acutifolia (Poir.) Cass.	sempre-viva	PO	FREIRE et al. (2011), STUMPF et al. (2009 a)
Pseudognaphalium gaudichaudianum (DC.) Anderb.	marcela, marcela-macho	PM	BARÃO (2016), FREIRE et al. (2011), FREIRE & URTUBEY (2000)
Pterocaulon alopecuroides (Lam.) DC.	toro-caa	PM Positive Mental Attitude	FREIRE et al. -2011
Pterocaulon polystachyum DC.	quitoco, toro-caa	PM	BARÃO (2016), FREIRE et al. -2011
Pterocaulon virgatum (L.) DC.	caraí-tuyá	Positive Mental Attitude	FREIRE et al. -2011
Senecio bonariensis Hook. & Arn.	margarida-do-banhado-de-buenos-aires, margarida-do-banhado	PO	CABRERA & KLEIN (1975), STUMPF et al. (2009 b)
Senecio brasiliensis (Spreng.) Less.	catião, erva-lanceta, flor-das-almas, maria-mole	Positive Mental Attitude PO	BARÃO (2016), BRIGHENTI et al. (2017), ALMEIDA et al. (2003), KISSMANN & GROTH (1999)
Senecio pulcher Hook. & Arn.	margarida-do-banhado	PO	CABRERA & KLEIN (1975), NUCIARI

			(2012)
Smallanthus conatus (Spreng.) H. Rob.	-	PA PM	ARÁOZ et al. (2012), VITALI & KATINAS (2015)
Solidago chilensis Meyen	erva-lanceta, arnica, espiga-de-ouro, lanceta, arnica-silvestre	PM PO	SILVA et al. (2013), STUMPF et al. (2009 a), BARÃO (2016), CEOLIN (2009), MENTZ et al (1997)
Sommerfeltia spinulosa (Spreng.) Less.	quebra-pedra	PM	CEOLIN (2009)
Sonchus asper (L.) Hill	serralha, serralha-de-espinho	PA	GONÇALVES-AZEVEDO & MATZENBACHER (2007), CHAVES et al. (2007), BARREIRA et al. -2015
Sonchus oleraceus L.	serralha, chicória-brava, serralha-branca, serralha-lisa	PM PA	GONÇALVES-AZEVEDO & MATZENBACHER (2007), KELEN et al. (2015), TERRA & VIERA (2019), BARREIRA et al. (2015), GREGORY et al. -2019
Stenachaenium campestre Baker	arnica, arnica-do-campo	PM	MARODIN & RITTER (1995)
Stenachaenium riedelii Baker.	língua-de-boi	Positive Mental Attitude	FREIRE et al. -2011
Stevia alternifolia Hieron.	stevia	PA	CABRERA & KLEIN (1989), GOYAL & GOYAL (2010)
Stevia morii R.M. King & H. Rob.	stevia	PA	CABRERA & KLEIN (1989), GOYAL & GOYAL (2010)
Stevia rebaudiana (Bertoni) Bertoni	stevia	PA	CABRERA & KLEIN (1989), GOYAL & GOYAL (2010)
Symphyotrichum squamatum (Spreng.) G.L. Nesom	estrela-comum, mata-jornaleiros	PM	SILVA et al. -2013
Taraxacum officinale F.H. Wigg.	dente-de–leão, dente-de-leão-do-jardim, amargosa	PM PA	KELEN et al. (2015), MONGE (2022), RIBEIRO et al. (2004), NETO & SIMÕES (2010), CEOLIN (2009), BARREIRA et al. (2015), GREGORY et al. -2019
Trichocline catharinensis Cabrera	cravo-do-campo-catarinense	PO	CABRERA & KLEIN (1973)
Trichocline macrocephala Less.	cravo-do-campo-vermelho	PM PO	CABRERA & KLEIN (1973), VANZELLA et al. -2006
Urolepis hecatantha (DC.) R.M. King & H. Rob.	cambará, eupatório	PM	RONDINA et al. -2008
Vernonanthura montevidensis (Spreng.) H. Rob.	cambarazinho, vassoura, vassoura-rosa	Positive Mental Attitude PO	SOARES (2012)
Vernonanthura nudiflora (Less.) H. Rob.	alecrim-do-campo, vassourinha-do-campo	PM	SILVA et al. (2013), BARÃO (2016), CABRERA & KLEIN (1980), RAMOS et al. -2009
Vernonanthura tweediana (Baker) H.Rob.	assa-peixe, chimarrita, erva-de-laguna, erva-de-mula, orelha-de-mula, língua-de-vaca, mata-pasto	PM Positive Mental Attitude	BARÃO (2016), CABRERA & KLEIN (1980)

Food potential (15 species): 4 (4.82%) species with exclusive application and 11 (13.25%) species with multiple applications. Medicinal potential (37 species): 15 (18.07%) species for medicinal purposes only and 22 (26.51%) species with various uses. Honey potential (15 species): 7 (8.43%) species for exclusive use and 8 (9.64%) species with more than one use. Ornamental potential (16 species): 8 (9.64%) species for exclusive use and 8 (9.64%) with various applications, as mentioned above in Table 1 and below in Figure 2.

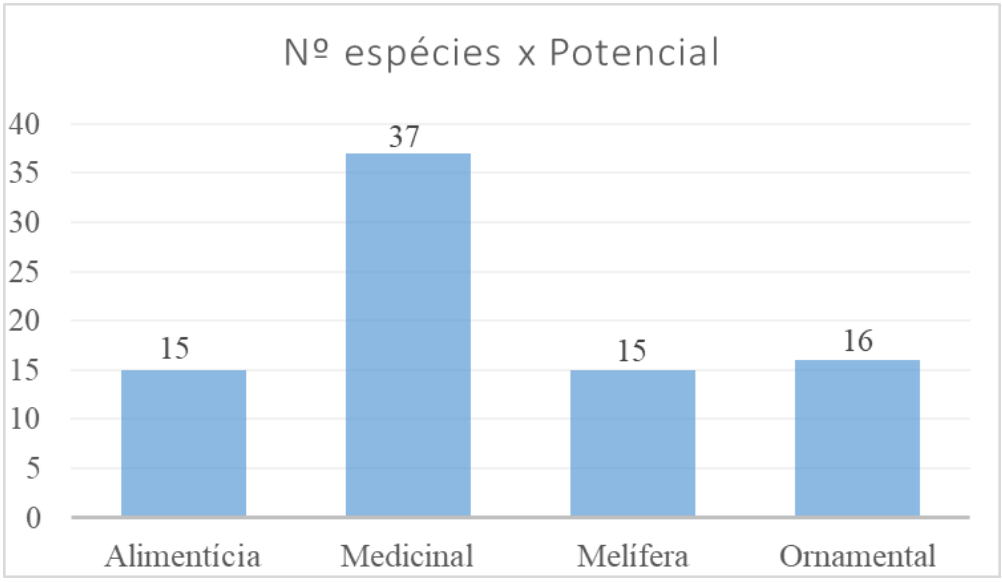

Figure 2. Distribution of potential uses of Asteraceae species at Fazenda Santa Rita, Lages - SC.
Figure 2. Distribution of potential uses of Asteraceae species at Santa Rita Farm, Lages – SC.

The genus *Baccharis* is economically important to man due to its various uses, popularly known as "carqueja", but not all species of this genus have medicinal potential. In this study, this genus was the most representative, with 12 species having potential for use. Of these, nine species have medicinal potential: *Baccharis anomala:* the aerial part of the plant is used as a diuretic and also for washing female genital organs, treating wounds and fighting infections in general (BARROSO & BUENO 2002).

Baccharis articulata: indicated for stomach pain and gas (HAEFFNER et al. 2012). The oleanolic acid present in the plant has anticholesterolemic, antihepatotoxic, antioxidant, anti-inflammatory, antifungal and antibiotic activities (HAEFFNER et al. 2012). The decoction and extract are used as a tonic and antifebrile (MENTZ et al. 1997), (SILVA et al. 2013).

Baccharis crispa: popularly indicated for stomach pain, diabetes, cholesterol, diarrhea and for eliminating gas (HAEFFNER et al. 2012). The decoction and extract are used as a tonic and antifebrile (MENTZ et al. 1997). Research has confirmed several traditional uses, including liver protection, digestive aid, ulcer and acid reduction, pain relief, inflammation reduction, and blood sugar control (LORENZI & MATOS 2008). Acts in obesity treatment through the presence of lyophilized methanolic extract that inhibits glycosidases and pancreatic lipase (SILVA et al. 2013).

Baccharis dracunculifolia: widely used in folk medicine to treat stomach, liver, and kidney issues, diabetes, prostate problems, inflammation, and general detoxification (OLIVEIRA-LIMA et al. 2019), having antioxidant activity (SILVA et al. 2013).

Baccharis erioclada, *B. microcephala*, *B. pentaptera*, and *B. vincifolia*: These species have therapeutic properties similar to B. crispa and are often used as substitutes in folk medicine (BARROSO & BUENO 2002).

Baccharis uncinella: has allelopathic, antioxidant, cytotoxic and anti-inflammatory components (SILVA et al. 2013).

It also has two species that are unique in their use as ornamentals: *B. ochracea and B. aliena.* The species *B. vulneraria* has nectar for attracting bees and is used as a potential honey bee.

Some species have more than one potential use, such as: *Achyrocline satureioides is used as a medicinal plant (FREIRE et al.* 2011, HAEFFNER et al. 2012, SILVA et al. 2013), but it can also be used to reduce lipid oxidation during salami storage (SILVA et al. 2013).

Chaptalia nutans has medicinal properties and can be used externally and internally, from headaches to bleeding (CABRERA & KLEIN 1973). It is also classified as a species used in human food as a PANC (GREGORY et al. 2019).

Solidago chilensis is a plant used in traditional medicine (SILVA et al. It can also be grown as an ornamental plant, producing large flower clusters that are popular in cut flower arrangements (STUMPF et al., 2013). 2009 a).

The three known Stevia species: *S. alternifolia, S. morii*, and S. *rebaudiana* are significant in nutrition as natural sugar sources, used as natural sweeteners to replace sugar in juices, teas, cakes, and other sweets, as well as in various processed products (GOYAL & GOYAL 2010).

Dandelion is an edible plant with roots, leaves, and flowers that can be used in salads. Its roasted root can also serve as a coffee substitute (RIBEIRO et al. 2004).

Trichocline macrocephala has significant ornamental value due to its large flower heads with red ray florets (CABRERA & KLEIN 1973). Its root (xylopodium) is a powerful kidney remedy prescribed by doctors in Santa Catarina. A study by VANZELLA and colleagues (2006), where certain plant compounds were isolated and tested, demonstrated a proven analgesic effect (action of nullifying or reducing the perception and transmission of pain-causing stimuli), acting as a centrally-acting painkiller similar to morphine.

Vernonanthura montevidensis is a species with ornamental potential, featuring abundant and fragrant blooms. It also has potential as a honey plant, as its inflorescences attract many bees (SOARES 2012).

Species lacking documented potential uses in the literature are listed below: *Acmella bellidioides (Sm.)* R. K. Jansen, *Aspilia martii* Baker, *Baccharis linearifolia* (Lam.) Pers., B. *oxyodonta* DC., B. *pentodonta Malme*, B. *weirii* Baker, Barrosoa *betonicaeformis* (DC.) R. M. King & H. Rob., *Bidens subalternans* DC., *Campovassouria cruciata* (Vell.) R. M. King & H. Rob., *Chaptalia exscapa* (Pers.) Baker, C. *piloselloides* (Vahl) Baker, *Chromolaena ascendens* (Sch. Bip. ex Baker) R. M. King & H. Rob., C. *congesta* (Hook. & Arn.) R. M. King & H. Rob., C. *hirsuta* (Hook. & Arn.) R. M. King & H. Rob., C. *squarrosoramosa* (Hieron.) R. M. King & H. Rob., C. *stachyophylla* (Spreng.) R. M. King & H. Rob., *Conyza primulifolia* (Lam.) Cuatrec. & Lourteig, *C. sumatrensis* (Retz.) E. Walker, *Disynaphia spathulata* (Hook. & Arn.) R. M. King & H. Rob., *Exostigma notobellidiastrum* (Griseb.) G. Sancho, *Grazielia intermedia* (DC.) R. M. King & H. Rob., *G. serrata* (Spreng.) R. M. King & H. Rob., *Gyptis tanacetifolia* (Gillies ex Hook. & Arn.) D. J. N. Hind & Flann, *Holocheilus hieracioides* (D. Don) Cabrera, *H. illustris* (Vell.) Cabrera, *Hypochaeris catharinensis* Cabrera, *H. variegata* (Lam.) Baker, *Jaegeria hirta* (Lag.) Less., *Lepidaploa psilostachya* (DC.) H. Rob., *Leptostelma tweediei* (Hook. & Arn.) D. J. N. Hind & G. L. Nesom, *Lessingianthus intermedius* (DC.) Dematt., *Neja pinifolia* (Poir.) G. L. Nesom, *Noticastrum acuminatum* (DC.) Cuatrec., *N. decumbens* (Baker) Cuatrec., *N. hatschbachii* Zardini, *Pamphalea araucariophila* Cabrera, P. *smithii Cabrera*, *Perezia catharinensis Cabrera*, *Picrosia cabreriana* A. G. Schulz, *Podocoma bellidifolia* Baker, Senecio grossidens Dusén ex Malme, *Senecio conyzaefolius* Baker, S. *juergensii Mattf*., S. *oleosus Vell*., *Soliva sessilis* Ruiz & Pav., *Stenocephalum megapotamicum* (Spreng.) Sch. Bip., *Symphyopappus decemflorus* H. Rob., *Symphyotrichum graminifolium* (Spreng.) G. L. Nesom, *S. regnellii* (Baker) G. L. Nesom and *Vernonanthura mucronulata* (Less.) H. Rob.

CONCLUSION

Most species mentioned (54.55%) have documented potential uses in literature, requiring further research for sustainable commercial exploitation.

Many commercially promising species were identified, with potential uses ranging from ornamental purposes to potential treatments for various diseases. Among these, the *Baccharis* genus shows the most economic promise. Understanding these species' potential makes them valuable for uses such as food, medicine, honey production, and decoration.

This botanical survey underscores the importance of conserving native grasslands to maintain local biodiversity and natural genetic resources. It's crucial to recognize each species' scientific value and prioritize exploring their potential for future research, especially in grassland areas where many species lack scientific data. This requires prioritizing genetic improvement research and photochemical studies to identify their potential uses and promote economic and social development.

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