Revista Brasileira de Farmacognosia
Brazilian Journal of Pharmacognosy
17(4): 640-653, Out./Dez. 2007
Recebido em 20/01/07. Aceito em 27/09/07

Divulgação

Ethnopharmacognostic survey on botanical compendia for potential cosmeceutic species from Atlantic Forest

Maique W. Biavatti[1]*, Vanessa Marensi[1], Silvana N. Leite[2], Ademir Reis[3]

[1]Núcleo de Investigações Químico-Farmacêuticas, Curso de Farmácia, Universidade do Vale do Itajaí, Rua Uruguai 458, 88302-202, Itajaí, Santa, SC, Brazil,
[2]Curso de Farmácia, Programa de Mestrado em Saúde e Gestão do Trabalho, Universidade do Vale do Itajaí, Rua Uruguai 458, 88302-202, Itajaí, Santa, SC, Brazil,
[3]Departamento de Botânica, Universidade Federal de Santa Catarina, Caixa-Postal 476, 88040-900, Florianópolis, SC, Brazil

RESUMO: "Levantamento etnofarmacognóstico em compêndios botânicos de espécies da Mata Atlântica com potencial cosmecêutico". A Mata Atlântica é um dos ecossistemas mais ameaçados do planeta, sendo reconhecida como uma área de grande biodiversidade sob alto nível de stress. A área cosmecêutica abrange medicamentos de uso tópico e cosméticos, e o uso de produtos naturais para aplicação externa sempre foi observado em diversas culturas. Este trabalho trata de uma análise etnofarmacognóstica de dois compêndios botânicos (CB): Dicionário das Plantas Úteis do Brasil - e das exóticas cultivadas, compilado por Pio Correa (PC) e Flora Ilustrada Catarinense (FIC). Destes compêndios, foram selecionadas espécies com uso cosmecêutico ou com características fisico-químicas e organolépticas relacionadas. Essas espécies selecionadas foram analisadas quanto à validade da nomenclatura botânica e a ocorrência de publicação científica, e quanto ao risco de extinção. PC e FIC apontaram que 245 espécies vegetais, pertencendo a 98 famílias, possuem uso cosmecêutico no Brasil. As famílias mais citadas foram: Asteraceae, Fabaceae, Myrtaceae, Annonaceae, Clusiaceae, Anacardiaceae, Apiaceae, Bignoniaceae e Solanaceae. As partes usadas mais citadas foram cascas, folhas e partes aéreas. As propriedades mais citadas foram efeito tônico e adstringente, seguido de efeito cicatrizante, emoliente, antiinflamatório, antiúlcera, anti-séptico, parasiticida e clareador da pele. De acordo com a pesquisa bibliográfica no Pubmed, a maioria das espécies selecionadas (65%) não foi investigada farmacológica e quimicamente.

Unitermos: Mata Atlântica, cosmecêuticos, etnobotânica.

ABSTRACT: The Atlantic Forest is one of the most endangered ecosystems on earth, and is acknowledged as an area with truly exceptional levels of biodiversity under enormous levels of stress. Cosmeceutics cover a border area between pharmaceuticals for skin diseases and cosmetics. Natural products for external application, to improve the appearance of the skin or for skin treatment, have always been observed and used by native cultures. The present work deals with the ethnopharmacognostic analysis of two botanical compendia (BC), named: Dicionário das Plantas Úteis do Brasil - e das exóticas cultivadas, compiled by Pio Correa (PC) Flora Ilustrada Catarinense (FIC). From these BC, reported species with cosmeceutical uses or with related physico-chemical or organoleptic characteristics were selected, updated, searched for scientific background and highlighted if endangered. PC and FIC specified that 245 plant species, belonging to 98 plant families, are used in Brazil for cosmeceutical, cosmetic or skin remedies. The families most widely represented were Asteraceae, Fabaceae, Myrtaceae, Annonaceae, Clusiaceae, Anacardiaceae, Apiaceae, Bignoniaceae and Solanaceae The most frequently cited plant parts were bark, followed by leaves and aerial parts. The most frequently cited properties were astringency and tonic effect followed by uses in skin disorders and wound healing, emollient characteristic, anti-inflammatory uses and healing of skin ulcers, antiseptic effects, parasiticide and skin lightening properties and aphrodisiacs. According to the Pubmed survey, most of the selected species (65%) have not been previously investigated for potential cosmeceutical applications, nor have their chemical composition been investigated.

Keywords: Atlantic forest, cosmeceutics, ethnobotany.

* *E-mail: maique@univali.br, Tel./Fax +55-47-33417601*

ISSN 0102-695X

INTRODUCTION

Overview

Biodiversity supplies the structure of the ecosystems that support essential living resources, including wildlife, fisheries and forests, helping to provide basic human needs such as food, and medicines. It comprises the ecosystems that maintain oxygen in the air, enrich the soil, purify the water, and regulate the climate, besides its recreational, cultural, spiritual and aesthetic values. The increasing consumption of resources, and the growing populations in society have led to a rapid loss of biodiversity, eroding the capacity of the earth's natural systems to provide the essential goods and services on which human communities depend (Arcanjo, 2000).

The Atlantic Forest is one of the most endangered ecosystems on earth, and is acknowledged as an area with truly exceptional levels of biodiversity, but it is also an area which is under enormous levels of stress, containing a high level of endemism. The Atlantic Forest is home to about 70% of all Brazilians and contains some of the largest urban centres on the continent. The South Brazilian State of Santa Catarina was originally totally covered by Atlantic Forest; today less than 8% of the original forest remains, occurring mostly in isolated remnants scattered throughout a landscape dominated by agricultural and extractive practices. At a provincial level, people are slowly becoming aware of the importance of the forest and the need to conserve it, but there is still a widespread misconception that the forest is unproductive. Different States still have contradictory policies and there lacks a common strategy for forest conservation (Galindo-Leal; Camara, 2003). It is therefore advisable that conservation mechanisms such as sustainable exploitation be planned to stimulate the continuity of efforts, lessening dependence on international funding. The Convention on Biological Diversity (CBD), signed in 1992, has been ratified by 178 countries, including Brazil, and provides a legal framework for a comprehensive ecosystem-based approach to conservation. It introduced the term access and its respective legal implications in three different contexts: access to genetic resources, access to technology, and access to the benefits derived from the use of biodiversity. In accordance with this treaty, and the tasks required for its implementation, the Brazilian Congress and Government have been working since 1995 to formulate the domestic legislation required to regulate the CBD vector which deals with access to genetic resources.

The last piece of legislation already in force is Provisional Decree 2052 (published for the first time in June 2000). This is the current Brazilian regulation on access to genetic resources, which disciplines substantial parts of the Convention of Biological Diversity. It recognizes the rights of indigenous peoples and local communities over their knowledge; defines their participation in agreements for use of the knowledge; and establishes general legalization on all uses prior to the day of the decree and the possibility of a registry to entitle the rights (Sant'Ana, 2002).

Cosmeceuticals

As in the case of *functional foods* "food that claims to have health benefits beyond basic nutrition" (Noonan; Noonan, 2004), *cosmeceutics* cover a border area between pharmaceuticals for skin diseases and cosmetics (that have been labelled as substances for skin application without therapeutic benefits). Natural products for external application, to improve the appearance of the skin or for skin treatment, have always been observed and used by native cultures, but have been neglected in recent ethnobiological and ethnopharmaceutical studies (Pieroni et al., 2004).

There is increasing interest worldwide, in the use of natural ingredients in foods and cosmetics (Leung; Foster, 2003). As an example, the root extract of *Pothomorphe umbellata* (Pariparoba, the indigenous name for a common shrub found in the Atlantic Forest) is being patented for pharmaceutical and dermocosmetics purposes, for the prevention and treatment of cell damage caused by exposure to UV rays and ageing. It contains 4-nerolidylcathecol, an antioxidant compound which protects the cell membrane. Pariparoba is used, over the long term, for digestive problems, liver disease and burns (Moraes, 1986; Ropke et al., 2002, 2003).

Few recent ethnobotanical field studies have been carried out in the Atlantic Forest, and those that do exist have mainly investigated medicinal plants (Di Stasi et al., 2002, Mendonça-Filho; Menezes, 2003; Souza et al., 2004; Morais et al., 2005; Brandão et al., 2006; Agra et al., 2007). Although, primary contact with traditional medical practitioners is the ideal method for carrying out ethnobotanical analysis, there are cases where traditional healers are no longer available. As a surrogate, Botanical Compendia (BC) - which are based on direct work with primary information - may provide sufficient insight to identify potential new lead species. To date, however, there has been no established protocol for investigating BC. Buenz et al. (2004) have developed a technique for carrying out ethnobotanical analysis on historic texts, using *Ambonese Herbal*: Volume I as a case example (Buenz et al., 2005).

The present work deals with the ethnopharmacognostic analysis of two botanical compendia (BC), named: *Dicionário das Plantas Úteis do Brasil - e das exóticas cultivadas,* compiled by Pio Correa (PC) (1926) in which species are alphabetically classified by popular name, without description of origin, but occurring in Brazilian territory, and *Flora Ilustrada Catarinense* (FIC). It is composed of 60

fascicules of botanical families presenting genera and species collected in the State of Santa Catarina - Brazil, and does not discriminate between cultivated and natural species.

From these BC, species were selected which have reported cosmeceutical uses or physico-chemical or organoleptic characteristics which have possible cosmeceutical applications, were chosen. Some of the species may be promising sources of new natural ingredients for cosmetic purposes, and also of new pharmacologically active compounds. Expected outputs with this work are an improvement in the valorization of native resources, and the promotion of sustainable use of species in the Atlantic rainforest.

MATERIAL AND METHODS

Selection of botanical compendia

Dicionário das Plantas Úteis do Brasil - e das exóticas cultivadas: Compiled by Pio Correa (PC). Manoel Pio Corrêa (1874-1934) was a naturalist from the Botanical Garden of Rio de Janeiro, and a member of the Société Botanique de France. The first volume of his Dictionary was published on 1926, and the subsequent volumes were published in 1931, 1952, 1969, 1974 and 1975, being re-edited by the Instituto Brasileiro de Desenvolvimento Federal - IBDF in 1984, in conjunction with the Ministry of Agriculture (1984). His opera has always been a classical reference for research on Brazilian flora, as a starting point.

Corrêa MP 1984. *Dicionário de Plantas Úteis do Brasil*, Ministério da Agricultura, Instituto Brasileiro de Desenvolvimento Florestal, Brasília, DF, vol. I 747 pp.; vol. II 777 pp.; vol. IV 765 pp.; vol. V 687 pp.

Flora Ilustrada Catarinense (FIC): Raulino Reitz (1919-1990) dedicated his life to surveying the flora of Santa Catarina. He discovered five genera and 327 new species of plants, and founded the Herbarium Barbosa Rodrigues which today has around 70,000 exsiccates. He conceived and edited the Flora Ilustrada Catarinense with 150 families in 172 fascicules. Sixty botanical specialists have collaborated in the elaboration of monographs, each in his or her own area of specialty. Each plant family is compiled in one fascicule, in the form of an encyclopaedia. To access the complete list of publications see: http://www.cttmar.univali.br/~hbr/fic.htm

Experimental design

After the selection of PC and FIC, all citations referring to external applications (topical treatments) of native species of Atlantic forest were extracted and tabled (Table 1). Potential pharmacological functions of plants for the skin, extrapolated from their uses in the treatment of certain disorders, were considered. Initially, the selected species with cited applications in a) skin and annexes pathologies (such as dermatitis, dermatosis, photo protection, microbial and viral infections, among others), b) prevention of ageing and skin maintenance (with antioxidant, astringent, tonic, hydrating and emollient activities, among others) and c) with physico-chemical or organoleptic characteristics (aromatic, foaming properties, colorant, etc) with possible cosmeceutical applications, were referenced through the International Plant Names Index (The Plant Names Project, 1999) and W^{3}TROPICOS (Missouri Botanical Garden, 2003), to identify binomial names and rule out synonymy or misspelling. The botanical names and author citations were also verified through these two databases. All plant species described as useful were investigated in the PUBMED database, seeking scientific information related to the profile of a cosmeceutical application (biological assays and isolated compounds). All the data collected were consolidated into a table; plants that were recognized for specific uses in PC and FIC but which did not have entries in PUBMED were cited as plants that might warrant further investigation.

RESULTS AND DISCUSSION

PC and FIC specified that 245 plant species, belonging to 98 plant families, are used in Brazil for cosmeceutical, cosmetic or skin remedies. Table 1 outlines all the plants detailed by the two compendia and the results of the scientific name search in the Pubmed database. The expanded data summarized in the Table 1 can be accessed in Marensi (2004). The families most widely represented were Asteraceae (13 species from *Baccharis, Blanchetia, Calea, Elephantopus, Helenium, Heterothalamus*, *Leucopsis, Melampodium, Vernonia*), Fabaceae (11 species from *Acacia, Bauhinia, Cassia, Enterolobium, Erythrina, Myrocarpus, Parapiptadenia, Pithecolobium, Pterodon*), Myrtaceae (11 species from *Calyptranthes, Eugenia, Myrcia, Psidium, Stenocalyx, Pseudocaryophyllus*), Annonaceae (8 species from *Annona, Guatteria, Rollinia, Xylopia*), Clusiaceae (7 species from *Hypericum* and *Kielmeyera*), Meliaceae and Anacardiaceae also with 7 species; Apiaceae, Bignoniaceae and Solanaceae (6 species each). The most frequently cited plant parts were bark (n = 52) or bark and other parts of the plant (n = 17), followed by leaves (n = 56) and aerial parts (n = 33). Roots, flowers, seeds, stems, fruits, rhizomes, resins, pulp and ashes were also reported.

The most frequently cited properties were astringency (n = 68) and tonic effect (n = 33), followed by uses in skin disorders (n = 25) and wound healing (n = 22), emollient characteristic (n = 22), anti-inflammatory uses (n = 14) and healing of skin ulcers (n = 12), antiseptic effects (n = 05), parasiticide and skin lightening properties (2 each) and aphrodisiacs (n = 8). The sum of listed references to physico-chemical and organoleptic

Table 1. Species indicated as cosmeceutical and to skin disorders from the botanical compendia (BC). Dicionário das Plantas Úteis do Brasil - e das exóticas cultivadas compiled by Pio Correa (PC) and Flora Ilustrada Catarinense (FIC). The species shown in (*) are endangered.

Botanical family Scientific name	Part used	Uses/observations from authors and BC	Occurrence	Pubmed
AIZOACEAE				
Sesuvium portulacastrum (L.)L	Leaves	Emollient and anti-scorbutic (FIC)	All tropical coast	2
Mollugo verticillata L.	Aerial parts	Saponins and aromatic principle (PC)	MA to RJ	1
ALISMATACEAE				
Echinodorus grandiflorus (Cham.&Schltdl.) Micheli	Leaves	Skin disorders as cataplasm (PC)	CE to RS, MT	0
ANACARDIACEAE				
Anacardium occidentale L.	Bark, Leaves	Astringent, against aphtas (PC)	Abundant on BR	34
Astronium urundeuva (Allemão) Engl. (*)	Bark	Tannin rich, used to tan (PC)	ES to SC, MT, MG, CE	4
Lithraea molleoides (Vell.) Engl.	Bark, Leaves	Tannin rich and colorant (PC)	MG, SP, RJ to RS	7
Schinus polygamus (Cav.) Cabrera.	Not cited	Myiasis (FIC)	RJ to SC	0
Schinus terebinthifolius Raddi	Bark, Leaves	Astringent, wound healing (FIC)	PE to RS	5
Spondias lutea L.	Bark,Leaves	Aromatic and astringent (PC)	AM to MG, SP and BA	2
Tapirira guianensis Aubl.	Leaves	Contains aromatic oil (PC)	Atlantic forest, cerrado	1
ANNONACEAE *Annona cherimolioides var. amplifolia* Triana & Planch.	Not cited	Ananas flavor. Cataplasm to inflammations. Fish poisoning (PC)	BA to RS	0
Annona furfuracea A. St.-Hil.	Seeds	Parasiticides against head lice (PC)	MG, SP, GO	0
Annona glabra L.; *A. australis* A. St.-Hil.	Not cited	Very aromatic, to perfumery (PC)	From BA to SC	12
Annona spinescens Mart.	Powdered seeds	Aromatic, against ptiriasis (PC)	From BA to south BR	2
Guatteria nigrescens Mart	Whole plant	Aromatic (PC)	BR	0
Rollinia exalbida (Vell.) Mart.	Bark	Tonic and astringent (PC)	RJ to RS	0
Rollinia salicifolia Schltdl.	Bark	Tonic and astringent (PC)	RJ to RS	0
Xylopia sericea A. St.-Hill	Seeds	Aromatic (PC)	ES to RS	0
APIACEAE				
Apium australe Thouars	Whole plant	Wound healing (PC)	RJ to RS	0
Apium sellowianum H. Wolff	Whole plant	Wound healing, skin disorders (FIC)	RJ to RS	0
Hydrocotyle asiatica L.	Roots	Skin ulcers, skin disorders (PC)	BR, in the coast side	3
Hydrocotyle callicephala (Chamisso) Urb.	Whole plant	Against freckles, skin spots(FIC)	RJ to RS	0
Hydrocotyle leucocephala (Cham. & Schltdl.	Whole plant	Contains essential oil, toxic (FIC)	RJ to RS	0
Hydrocotyle umbellata L.	Whole plant	Against freckle, spots, erysipela (FIC)	RJ to RS	0
APOCYNACEAE *Aspidosperma gomezianum* A. DC. *Aspidosperma pyricollum* Müll. Arg.	Bark	Tonic and tannin rich (PC)	All Brazilian coast	0 1
Geissospermum vellosii Allemão	Bark	Tonic (PC)	ES, RJ, MG and BA	0
AQUIFOLIACEAE				
Ilex acrodonta Reiss.	Bark	Astringent and tonic (PC)	RJ and MG	0
ARACEAE				
Philodendron cordatum Kunth; *Philodendron corcovadense* Kunth	Flowers	Carnation perfume (PC)	PA, RJ and PE	0
Xanthosoma pentaphyllum (Vell.) Schott	Resin	Aromatic(PC/FIC)	South BR and MG	4

Rev. Bras. Farmacogn.
Braz. J. Pharmacogn.
17(4): Out./Dez. 2007

ARAUCARIACEAE				
Araucaria angustifolia (Bertol.) Kuntze (*)	Whole plant	Against testicle inflammation (PC)	RJ to SC and MG	0
ARISTOLOCHIACEAE				
Aristolochia cymbifera M. e Zucc	Whole plant	Anti-septic, against scabies (PC)	BA to RS, GO and MG	0
Aristolochia warmingii Mast.	Roots and leaves	Against contusions, snake bite (PC)	GO and MT	0
ASTERACEAE				
Baccharis articulata (Lam.) Pers.	Dried plant	Cicatrisation over syphilitic (FIC)	Abundant in SC, RS	2
Baccharis leptocephala DC.	Leaves	Anti-herpetic (FIC)	RJ to RS	0
Baccharis medullosa DC.	Aerial parts	Anti infections (FIC)	South BR	2
Baccharis trimera (Less.) DC.	Aerial parts	Antioxidant, tonic, anti-ulcerous (FIC)	South BR	6
Baccharis vacciniifolia Cuatrec.	Aerial parts	Contains essential oil (FIC)	South BR	0
Blanchetia heterotricha DC.	Whole plant	Excitant and aromatic (PC)	BA	0
Calea uniflora Less.	Whole plant	Astringent and bitter (PC)	South BR	1
Elephantopus mollis Kunth.	Leaves, roots, Resin	Emollient, resolutive (FIC)	Present all BR	6
Helenium alternifolium (Sprengel) Cabrera	Whole plant	Contains saponin, essential oil (PC)	SP to RS	0
Heterothalamus psiadioides Less	Leaves	Aromatic, excitant, febrifuge (PC)	SP and RJ to RS	0
Leucopsis tweediei (Hook. & Arn.) Baker	Aerial parts	Wound healing (PC)	MG to RS	0
Melampodium divaricatum (Rich.) DC.	Aerial parts	Tonic and aromatic (PC)	MG and SP	3
Vernonia scorpioides (Lam.) Pers.	Aerial parts	Bath for hemorrhoid (FIC)	Widespread BR	1
AZOLLACEAE				
Azolla filiculoides Lam.	Leaves	Anti scorbutic, aphrodisiac (FIC)	South BR	0
BALANOPHORACEAE				
Scybalium fungiforme Schott & Endel.	Floral peduncle	Cooked is aphrodisiac (FIC)	RJ and MG	0
BEGONIACEAE				
Begonia paulensis A. DC	Leaves	To wash inflamed eyes (PC)	SP	0
BERBERIDACEAE				
Berberis laurina Billb.	Leaves	Against inflammation (PC)	SP to RS, MG	2
BIGNONIACEAE				
Arrabidaea chica (Humb.& Bonpl.) B. Verl.	Leaves	To wash wounds and ulcers (PC)	BR	2
Crescentia cujete L.	Leaves	Erysipelas and skin diseases (PC)	AM to RJ	2
Doxantha unguiscati (L.) Miers. ex Rehder	Bark	Tannins, as colorant (FIC)	BR	0
Jacaranda micrantha Cham.; *J. copaia* (Aubl.) D. Don	Bark	Astringent to chronic skin (PC)	BA to RS, MG and GO	0
Tecoma impetiginosa Mart. Ex DC.	Bark	Astringent (PC)	MG and PI	3
Tecoma umbellata Sond.	Bark	Astringent (PC)	MG and SP	0
BORAGINACEAE				
Cordia grandiflora (Desv.) Kunth	Fruit	Astringent (PC)	BR	0
Cordia monosperma (Jacq.)Roem & Schult.	Leaves	For contusions, inflammations (FIC)	South BR coast	0
Cordia superba Cham.	Fruit pulp	Mucilaginous (PC)	RJ, MG and SP	0
Cordia verbenacea DC.	Leaves	For contusions, inflammations (PC)	South BR coast	4
Patagonula americana L.	Leaves	Decoction is emollient (FIC)	South BR	1

BROMELIACEAE				
Bromelia antiacantha Bertol.	Juice of fresh fruits	Vulnerary, aphtas, mucosa infection (FIC)	South BR	0
Ananas bracteatus (Lindl.) Schult. & Schult. f.	Fresh fruit	Vulnerary, aphtas (FIC)	BR	0
Tillandsia usneoides (L.) L.	Whole plant juice	With fat unguent for hemorrhoids (FIC)	South BR	8
BURSERACEAE				
Bursera leptophloeos Mart.	seeds	Contains medicinal oil (PC)	BR	0
Protium kleinii Cuatrec	Resin	Antifungal (FIC)	South BR	3
CACTACEAE				
Cereus macrogonus Salm-Dyck	Flowers	Aromatic (PC)	RJ to RS	0
Pereskia aculeata Mill.	Leaves	Emollient (PC)	BA to RS and MG.	0
CANNACEAE				
Canna warszewiczii A. Diert	Leaves	Emollient (PC)	MG, SC and RS	0
CANELLACEAE				
Cinnamodendron axillare Endl. Ex Walp.	Bark	Aromatic, pungent, wound healing (FIC)	South BR.	0
Cinnamodendron dinisii Schwacke	Bark	Remedy for all affections (FIC)	MG, SP, PR, RS	0
CAPPARACEAE				
Crataeva benthamii Eichler	Roots leaves	Tonic (PC)	AM	0
CAPRIFOLIACEAE				
Sambucus australis Cham. & Schltdl.	Leaves flowers	To skin inflammation, boil (FIC)	South BR	0
CARYOPHYLLACEAE				
Alsine vulgaris Moench.	Planta	Astringent, used in perfumery (PC)	South BR	0
CECROPIACEAE				
Cecropia peltata L	Leaves	Astringent (PC)	RJ to RS	2
CELASTRACEAE				
Maytenus gonoclada Mart.	Leaves and bark	Tonic and stimulant (PC)	SP to RS	0
Maytenus obtusifolia Mart.	Leaves	Ulcers healing (PC)	PI to RJ, MG and GO	1
CHLORANTHACEAE				
Hedyosmum brasiliense Miq.	Leaves	To heal athletes foot (PC/FIC)	RJ, MG, SP, south BR	1
CHRYSOBALANACEAE				
Licania dealbata Hook. F.	Bark	Astringent (PC)	PE to BA	0
Licania incana Aubl.	Bark	Astringent (PC)	AM, RJ e MG	0
CLUSIACEAE				
Hypericum brasiliense Choisy	Aerial parts	Astringent and aromatic (FIC)	South BR	6
Hypericum connatum Lam.	Aerial parts	Tonic and astringent (FIC)	South BR	5
Hypericum laxiusculum A. St-Hill	Leaves	Astringent, aromatic, excitant (PC)	SP to RS and MG	0
Hypericum teretiusculum A. St.-Hil	Leaves	Excitant and aromatic (FIC)	Meridional plateaus	0
Kielmeyera petiolaris var. *cipoensis* N.Saddi	Not cited	Emollient properties (PC)	GO, RJ and MG	0
Kielmeyera rosea (Spreng.) Mart.	Not cited	Emollient (PC)	MG and SP	0
Kielmeyera speciosa A. St.-Hil.	Rhizome	Emollient (PC)	BA to SP, MG and GO	0

Rev. Bras. Farmacogn.
Braz. J. Pharmacogn.
17(4): Out./Dez. 2007

COMBRETACEAE				
Laguncularia racemosa (L.) C.F. Gaertn.	Bark and leaves	Tannin rich (FIC)	All Brazilian coast	0
CONVOLVULACEAE				
Ipomoea pes-caprae (L.) R. Br.	Leaves	Emollient, mucilaginous decoct (PC)	PA to SP	11
CRASSULACEAE				
Bryophyllum pinnatum (L. f.) Oken	Fresh leaves	Heal wounds (PC)	Tropical regions	13
CUCURBITACEAE				
Cayaponia cabocla (Vell.) Mart.	Not informed	Depurative of skin affections (PC)	BA to PR and MG	0
Fevillea trilobata L.	Oil	Topic use against erysipelas (PC)	AM, BA,CE to PR, MG	2
Lagenaria vulgaris Ser.	Leaves	Heal athletes foot (PC)	Abundant all BR	0
Trianosperma tayuya Mart.	Whole plant	Against skin diseases (PC)	BA to RS, MG and MT	9
Wilbrandia verticillata (Vell.) Cogn.	Stems and leaves	Hidropsy and erysipelas (PC)	Southest BR	2
CYPERACEAE				
Kyllinga odorata Vahl.	Roots	Essential oil for perfumery (PC)	PA to RS, MG and MT	0
DIOSCOREACEAE				
Dioscorea laxiflora Mart. ex Griseb.	Roots	Against leprosy (PC)	AL to SC and GO	238
Dioscorea dodecaneura Vell.	Roots	To treat skin affections (FIC)	BR	0
DROSERACEAE				
Drosera communis A. St.-Hil *Drosera montana* A. St.-Hil	Whole plant	Red colorant (FIC)	South BR	1
ERYTHROXYLACEAE				
Erythroxylum myrsinites Mart.	Bark	Astringent (FIC)	SC, MG, SP, RS	0
Erythroxylum suberosum A. St.-Hil.	Bark	Astringent (PC)	PI to RS, MG, GO, MT	0
EUPHORBIACEAE				
Croton antisyphiliticus Mart.	Leaves	Accelerates wound cicatrisation (PC)	RS, MG and GO	0
Croton campestris A. St.-Hil.	Roots, Leaves	Used to dry ulcers; resinous (PC)	BR	0
Manihot glaziovii Mull. Arg.	Seeds	Aromatic oil (PC)	All Brazilian coast	0
Omphalea diandra L	Leaves, seeds	Medicinal soap to heal ulcers (PC)	Humid land, Amazon	0
FABACEAE				
Acacia farnesiana (L.) Willd.	All parts	Aromatic, applied as plaster in tumors (PC)	PE to RS, MG and MT	5
Bauhinia candicans Benth.	Bark	Astringent (PC)	RJ to RS	2
Bauhinia langsdorffiana Bong.	Leaves	Mucilaginous and astringent (PC)	Brazilian coast	0
Bauhinia pulchella Benth.	Bark	Improves cicatrisation (PC)	PI to MG and PR	0
Cassia verrucosa Vogel	Whole plant	Tonic and astringent (PC)	SP, RJ and BA	0
Enterolobium timbouva Mart.	Fruits	Used as soap (PC)	BA to RS	0
Erythrina crista-galli L.	Bark	Astringent and wound healing (PC)	South BR	2
Myrocarpus frondosus Allemão (*)	Wood	Used in perfumery, heal wound (PC)	RJ to RS	0
Parapiptadenia rigida (Benth.) Brenan	Gum	Emollient (FIC)	South BR	1
Pithecolobium auaremotemo Mart.	Bark	Used for soap production (PC)	CE to RJ	0
Pterodon pubescens (Benth.) Benth.	Bark	Contains aromatic oil (PC)	MG, SP, GO and MT	11

FLACOURTIACEAE				
Casearia cambessedesii Eichler	Not cited	Improves cicatrisation (PC)	MG and RJ.	0
Casearia obliqua Spreng.	Not cited	Skin disorders (FIC)	BA to RS	0
Casearia sylvestris	Leaves	Anti-herpetic (FIC)	BA to RS	15
Carpotroche brasiliensis (Raddi.) Endl.	Not cited	Against dandruff, anti-herpetic (PC)	BA to SP and MG	0
Xylosma salzmannii (Clos) Eichler	Bark	Astringent and colorant (PC)	RJ to RS and MG	0
GESNERIACEAE				
Gesneria allagophylla Mart.	Root	Tonic and emollient (PC)	RJ to RS and MG	0
HIPPOCRATEACEAE				
Salacia sylvestris (Mart.) Steud.	Pulp and leaves	Mucilaginous, anti-inflammatory (PC)	RJ, MG, SP	0
ICACINACEAE				
Villaresia congonha Miers	Not cited	Aromatic and stimulant (PC)	SP to RS, MG, GO	0
IRIDACEAE				
Tigridia lutea Link, Klotzsch & Otto	Flowers	Aromatic (PC)	MG, SC	0
LAMIACEAE				
Glechon ciliata Benth.	Whole plant	Aromatic (PC)	SC, RS and SP	0
Mentha rotundifolia (L.) Huds.	Whole plant	Aromatic (PC)	South BR	3
Ocimum micranthum Wild.	Leaves	Aromatic oil (PC)	South BR	3
Peltodon longipes Kunth ex Benth.	Leaves	Aromatic oil (PC)	South BR and SP	0
LAURACEAE				
Aiouea saligna Meisn.	Bark	Astringent (FIC)	South BR and MG	0
Aniba gardneri (Meisn.) Mez.	Roots, Bark	aromatic oil to perfumery (PC)	RJ, SP (littoral) MG PR	0
Cryptocarya moschata Nees & C. Mart	Bark	Bitter and aromatic(PC/FIC)	BA to RS and MG	2
Nectandra leucantha Ness & Mart.	Wood	Aromatic bitter and tonic (PC)	AL to SC	0
Nectandra leucothyrsus Meisn.; *N. rigida* Ness	Bark	Seed to heal wounds (PC)	RJ to SC and MG	0
LECYTHIDACEAE				
Cariniana legalis (Mart.) Kuntze (*)	Bark	Mouth and vagina affections (PC/FIC)	ES to SP, MG and TO	0
LILIACEAE				
Herreria salsaparilha Mart.	Roots	Skin disorders (PC)	BA, SP, MG, MT	0
LYTHRACEAE				
Cuphea aperta Koehne	Whole plant	Depurative; skin affections (FIC)	Endemic in BR	0
MAGNOLIACEAE				
Talauma ovata A. St-Hill	Flowers	Aromatic oil (PC)	RJ and MG	3
MALPIGHIACEAE				
Galphimia brasiliensis (L.) A. Juss.	Whole plant	Tonic and astringent (PC)	PA to RS and MG	0
Byrsonima verbascifolia (L.) DC.	Bark	Astringent and febrifuge (PC)	BR	1
MALVACEAE				
Abutilon purpurascens (Link) K. Schum.	Aerial parts	Emollient (PC)	South BR	0
Hibiscus bifurcatus Cav	Leaves	Emollient, eliminate acne (PC)	Wetlands of BR	0
Malva leiocarpa Iljin	Leaves	Emollient (PC)	MT and RS	0

Rev. Bras. Farmacogn.
Braz. J. Pharmacogn.
17(4): Out/Dez. 2007

Sida macrodon DC	Leaves	To wash wounds (PC)	MG and SP	0
Sphaeralcea miniata var. *cisplatina* (St.Hil.) K. Schum.	Leaves	Emollients (PC)	South BR	0
MELASTOMATACEAE				
Tibouchina mutabilis (Vell.). Cogn.	Bark	Very astringent. To wash ulcers (PC)	RJ to SC	0
MELIACEAE				
Cabralea canjerana (Vell.) Mart.	Folha	Febrifuge, against arthritis (FIC)	RJ to RS	0
Cedrela fissilis Vell. (*)	Bark	Astringent, against leucorrhea (FIC)	South BR	0
Cedrela lilloi C.DC. (*)	bark	Idem *Cedrela fissilis* Vell. (FIC)	South BR	1
Cedrela odorata L. (*)	Bark	Aromatic (FIC)	BR	2
Guarea macrophylla Vahl	Roots	Astringent, to treat skin affections (FIC)	RJ,MG,MS to PR	2
Guarea spicaeflora A. Juss.	Roots	Astringent, tonic, to treat skin (PC)	SP and RJ	0
Trichilia catigua A. Juss.	Bark	To heal rheumatism, astringent (PC/FIC)	SP to RS and MG	6
MENISPERMACEAE				
Cissampelos ovalifolia DC.	Roots	Tonic (PC)	BR	2
MONIMIACEAE				
Siparuna camporum (Tul.) A. DC	Leaves	Aromatic (PC)	Brazilian coast	0
MORACEAE				
Dorstenia brasiliensis Lam.	Whole plant	Against skin disorders, tonic (PC)	PE to RS and MG	3
Trophis racemosa (L.) Urb.	Bark	Tannin rich (PC)	RJ, cultivated	1
MUSACEAE				
Musa paradisiaca L.	Stem and flowers	To manufacture of soap (PC)	BR	55
MYRISTICACEAE				
Virola bicuhyba (Schott) A.C.Sm.	Bark	Astringent (FIC)	RJ to RS	0
MYRSINACEAE				
Myrsine coriacea (Sw.) R. Br. ex Roem. & Schult.	Bark	Tannin rich (PC)	BR	0
Rapanea guyanensis Small	Bark	Tannin rich (PC)	BR	0
MYRTACEAE				
Calyptranthes tuberculata O. Berg	Bark	Astringent (PC)	RJ, SP and MG	0
Calyptranthes variabilis O. Berg	Not cited	Aromatic and excitant (PC)	SP to RS and MG	0
Eugenia astringens Cambess.	Fruit	Astringent (PC)	RJ to RS	0
Eugenia cauliflora O. Berg.	Bark	Astringent, erysipelas (PC)	South BR	0
Eugenia crenata Vell (*)	Bark and leaves	Astringent and aromatic (PC)	RJ and SP	0
Eugenia ovalifolia Camb.	Whole plant	Astringent (PC)	RJ and SP	0
Eugenia tomentosa Aubl.	Leaves, seeds ,fruit	Astringent, refrigerant (PC)	RJ to RS	0
Myrcia tingens O. Berg	Bark	Astringent, to wash ulcers (PC)	RJ and SP	0
Psidium guajava L.	Bark	Astringent, aromatic oil (PC)	Abundant BR	89
Stenocalyx sulcatus (Spring ex Martius) O. Berg	Fruit	Aromatic (PC)	RJ to RS	0
Pseudocaryophyllus sericeus O. Berg	Bark	To perfumery (PC)	RJ, SP, MG	0
NYCTAGINACEAE				
Mirabilis jalapa L.	Flowers	Very aromatic (FIC)	Abundant BR	9

NYMPHAEACEAE				
Nymphaea amazonum Mart. Zucc.	Leaves	Perfumery (PC)	PA to PR	0
OCHNACEAE				
Ouratea castaneifolia (DC.) Engl.	Bark	Astringent and tonic (PC)	AM to SP, MG, GO, MT	0
OLACACEAE				
Ximenia coriacea Engl.. *X. americana* L.	Bark, pulp, Seeds	Astringent, wound antiseptic (PC/FIC)	CE to RS	0
ORCHIDACEAE				
Cattleya bicolor Lindl. (*)	Leaves	Aromatic (PC)	SP, RJ and MG	0
Vanilla palmarum (Salzm. ex Lindl.) Lindl.	Fruit	Aromatic and aphrodisiac (PC)	BA to SP, MT	0
Vanilla planifolia Andrews.	Fruit	Stimulant, used in perfumery (PC)	PE to SP, MG, GO	0
OXALIDACEAE				
Oxalis debilis Kunth.	Leaves	Anti scorbutic (FIC)	South BR	0
Oxalis corniculata L.	Leaves	To clean teeth, against warts (FIC)	BR (MG, SP)	1
PASSIFLORACEAE				
Passiflora alliacea Barb. Rodr.	Fruit	Very aromatic (PC)	RJ to RS	0
Passiflora foetida L.	Not cited	To skin inflammation, erysipelas (FIC)	South BR	1
PHYTOLACCACEAE				
Phytolacca dioica L	Wood ashes, Fruit juice	Manufacture of soap Colorant (vine falsification) (PC)	RJ to RS and MG	1
Phytolacca thyrsiflora Fenzl.ex J.A. Schmidt.	Fruits	Colorant (FIC)	RS and SC	0
Seguieria langsdorffii Moq.	Leaves	Against beriberi, paralysis (PC)	MG and SP	0
PIPERACEAE				
Peperomia hederaceae Miq.	Leaves	Tonic (PC)	RJ and SC	0
PLUMBAGINACEAE				
Limonium brasiliense (Boiss.) Kuntze.	Not cited	Very astringent (FIC)	All Brazilian coast	1
POACEAE				
Agrostis nebulosa Boiss. & Reut.	Rhizomes	Emollient (PC)	South BR	0
Elionurus rostratus Nees.	Fruits	Against rheumatism (PC)	South BR	0
Gynerium parviflorum Nees	Not cited	Fortifying hair (PC)	PI to SP	0
Pharus glaber Kunth.	Leaves and fruits	Astringent, emollient (FIC)	BR	0
POLYGALACEAE				
Polygala paniculata L.	Roots	Aromatic (FIC)	BR	3
Polygonum stypticum Cham. & Schltdl.	Roots	Astringent (PC)	South BR	0
POLYPODIACEAE				
Polypodium vacciniifolium Langsd.& Fisch.	Aerial parts	Astringent (FIC)	South BR	0
PORTULACACEAE				
Portulaca oleracea L.	Stem and leaves	To treat eye affections, burns (PC)	BR	40
Talinum racemosum (L.) Rohrb.	Leaves	To extract corns (PC)	MG and RJ to RS	0
PTERIDACEAE				
Adiantum trapeziforme L.; *A .incisum* Forssk.	Leaves	Emollient, against baldness (PC)	RJ to SC, MT, MG	0

Rev. Bras. Farmacogn.
Braz. J. Pharmacogn.
17(4): Out./Dez. 2007

RHAMNACEAE				
Discaria febrifuga Mart.	Bark	Tonic (PC)	South BR	2
Reissekia smilacina Endl.	Not cited	Foaming properties (PC)	BA to RJ	0
RHIZOPHORACEAE				
Rhizophora mangle L.	Leaves, bark, roots	Very astringent (FIC)	AM to SC	10
ROSACEAE				
Prunus sellowii Koehne.	Flowers	Cyanogenic (FIC)	South BR	0
Quillaja brasiliensis (A. St-Hill& Tul.) Mart.	Bark	Foaming properties (PC/FIC)	SP to RS	1
RUBIACEAE				
Basanacantha annae K. Schum.	Leaves	Aromatic (PC)	RJ to RS	0
Basanacantha spinosa (Jacq.) K. Schum.	Flowers	Aromatic to perfumery (PC)	BR	0
Hamelia patens Jacq	Leaves and stems	Astringent (PC)	South BR	9
Remijia ferruginea (A. St.-Hil.) DC.	Bark	Tonic (PC)	BA to SP	1
RUTACEAE				
Fagara rhoifolia (Lam). Engl.	Roots, Bark	Colorant, aromatic, astringent (FIC)	South BR	0
Fagara hyemalis (A. St-Hill) Engl.	Bark and roots Fruit	Balsamic aroma (FIC)	South BR	0
Hortia brasiliensis Vand. ex DC	Bark	Tonic (PC)	BA, MG and GO	0
Monnieria trifolia L.	Root	To eye inflammation (PC)	PE to BA and MG	1
Pilocarpus pennatifolius Lem.	Leaves	Sudorific, energetic (FIC)	PR to RS	0
SANTALACEAE				
Acanthosyris spinescens (Mart. & Eichler)Griseb.	Leaves	Wash ulcers and wounds (PC)	South BR	1
Jodina rhombifolia Hook. & Arn.	Not cited	Astringent (FIC)	South BR	1
SAPINDACEAE				
Magonia glabrata A. St.-Hil.	Bark, Flowers	Wash wounds, aromatic (PC)	CE, MG	0
Melicoccus bijugatus Jacq.	Bark, Fruit	Tannin rich, Aromatic (PC)	South America	0
Sapindus divaricatus Willd ex A. St.-Hil.	Bark	Astringent, foaming properties (PC)	PE to SP	0
Sapindus saponaria L.	Fruit	Foaming properties (FIC)	North and northeast BR	3
SAPOTACEAE				
Bumelia sartorum Mart.	Bark	Astringent (PC)	PI to MG	2
Lucuma neriifolia Hook e Arn.	Bark	Astringent (PC)	RS	1
Pouteria lasiocarpa (Mart.) Radlk.	Bark	Astringent and latescent (FIC)	SC, MT, AM, PR	0
Pradosia lactescens (Vell.) Radlk.	Not cited	Against ulcers and eye affections (PC)	AL to SP and MG	1
Sideroxylon rugosum (Sw.) Roem. & Schult.	Bark	Astringent (PC)	Tropical America	0
SCHIZAEACEAE				
Anemia fraxinifolia Raddi	Whole plant	Mucilaginous (PC)	BR	0
SCROPHULARIACEAE				
Antirrhinum majus L.	Whole plant	Emollient, astringent (PC)	BR	0
Bacopa aquatica Aulb.	Whole plant	Heal burns and wounds (PC)	PE to BA	0
Conobea aquatica Aubl.	Not cited	Stimulant aroma (PC)	PE to RJ	0
SIMAROUBACEAE				
Marupa francoana Miers	Fruit and bark	Tonic (PC)	MG, PA, BA	0

Tariri ciliata Baill.	Bark	Aromatic (PC)	RJ and SP	0
SOLANACEAE				
Cestrum nocturnum L.	Not cited	Emollient and calming (PC)	SP, MG	8
Cestrum parqui L'Hér.	Not cited	Against skin affections (PC)	SP e RS	6
Solanum aculeatissimum Jacq	Root	Against skin affections (PC)	BA to SP	0
Solanum americanum Mill.	Leaves	Fresh over wounds and ulcers, (FIC)	Abundant BR	7
Solanum cernuum Vell.	Leaves	Against ulcers (PC)	ES to SP	0
STERCULIACEAE				
Basiloxylon brasiliensis (Allemão) K. Schum.	Bark	Astringent (PC)	ES, RJ	0
Waltheria douradinha St. Hilaire	Whole plant	Emollient, to wash wounds (FIC)	South BR	1
STYRACACEAE				
Styrax glabratus Schott	Resin	Balsamic (FIC)	South BR	0
SYMPLOCACEAE				
Symplocos platyphylla (Pohl) Benth.	Bark and roots	Astringent, tonic, mucilaginous (PC)	MG and RS	0
TILIACEAE				
Triumfetta rhomboidea Jacq.	Leaves and roots	Mucilaginous and astringent (PC)	BR	1
URTICACEAE				
Boehmeria caudata Sw	Leaves	Against hemorrhoid, eye infection (PC)	PE to PR, MG	0
VERBENACEAE				
Avicennia officinalis L.	Not cited	Aphrodisiac (PC)	All Brazilian coast	0
Citharexylum barbinerve Cham.	Flowers	Perfumery (PC)	RS	0
Stachytarpheta dichotoma (Ruiz & Pav.) J.Vahl	Leaves	Aromatic (PC)	PA, BA to SP and MG	0
VIOLACEAE				
Anchietea salutaris A. St- Hil	Whole plant	Useful to the skin (PC)	ES to SP, MG and GO	0
WINTERACEAE				
Drimys angustifolia Miers.	Bark	Aromatic, sudorific and tonic (FIC)	South BR	0
XYRIDACEAE				
Xyris laxifolia Mart.	Whole plant	Against eczemas (PC)	AM to RS and MG	0

AL = Alagoas; AM = Amazonas; BA = Bahia; BR = Brazil; ES = Espírito Santo; GO = Goiás; MA = Maranhão; MG = Minas Gerais; MT = Mato Grosso; PA = Pará; PE = Pernambuco; PI = Piauí; PR = Paraná; RJ = Rio de Janeiro; RS = Rio Grande do Sul; SC = Santa Catarina; SP = São Paulo; TO = Tocantins.

characteristics of interest for cosmeceutical purposes are: aromatic or essential oil (n = 66), mucilages (n = 12), tannins (n = 10), foaming properties (n = 11) and resins (n = 02). In the forest, the most popular method of classifying plants is based on the bark color and shape, and this empirical classificatory system may be reflected in the number of citations of bark as the part of the plant used.

Proanthocyanidins or condensed tannins are a group of antioxidant active polyphenolic bioflavonoids that are synthesized by many plants. Proanthocyanidins and other tannins are known to facilitate wound healing (Khanna et al., 2001). The mode of action, however, remains unclear. Some authors speculate that antioxidant activity contributes favorably to the healing of wounds, because reactive oxygen species produced during the inflammatory process aggravate the disorders in the tissues (Lopes et al., 2005; Souza et al., 2007).

According to the Pubmed survey, most of the selected species (65%) have not been previously investigated for potential cosmeceutical applications, neither has their chemical composition been investigated. This fact suggests that the data compiled in this work constitutes a valuable source of primary information for scientific investigation in cosmeceutical and related areas.

ACKNOWLEDGMENTS

The authors wish to thank Ana Claudia Araújo, for her help with the correct botanical identification of species and habitats of origin, and UNIVALI for its financial support.

REFERENCES

Agra MF, França PF, Barbosa-Filho JM 2007. Synopsis of the plants known as medicinal and poisonous in Northeast of Brazil. *Rev Bras Farmacogn 17*: 114-140.

Arcanjo FEM 2000. *Intellectual property rights and biodiversity in Brazil: conservation, sustainable use and protection of the indigenous rights. Institute of Brazilian Business and Public Management Issues* - IBI. Minerva Program. www.gwu.edu/~ibi/minerva/Fall2000/Eugenio.Arcanjo.pdf, accessed 11 Feb 2005.

Brandão M.GL, Cosenza GP, Moreira RA, Monte-Mor RLM 2006. Medicinal plants and other botanical products from the Brazilian Official Pharmacopoeia. *Rev Bras Farmacogn 16*: 408-420.

Buenz EJ, Schnepple DJ, Bauer BA, Elkin PL, Riddle JM, Motley TJ 2004. Techniques: Bioprospecting historical herbal texts by hunting for new leads in old tomes. *Trends Pharmacol Sci 25*: 494-498.

Buenz EJ, Johnson HE, Beekman EM, Motley TJ, Bauer BA 2005. Bioprospecting Rumphius's Ambonese Herbal: Volume I. *J Ethnopharmacol 96*: 57-70.

Di Stasi LC, Oliveira GP, Carvalhaes MA, Queiroz-Junior M, Tien OS, Kakinami SH, Reis MS 2002. Medicinal plants popularly used in the Brazilian Tropical Atlantic Forest. *Fitoterapia 73*: 69-91.

Galindo-Leal C, Camara IG 2003. *The Atlantic Forest of South America: Biodiversity status, threats, and outlook.* Washington, DC: Island Press, 488 p.

Khanna S, Roy S, Bagchi D, Bagchi M, Sen CK 2001. Upregulation of oxidant-induced VEGF expression in cultured keratinocytes by a grape seed proanthocyanidin extract. *Free Radical Bio Med 31*: 38-42.

Leung AY, Foster S 2003. *Encyclopedia of common natural ingredients used in food, drugs and cosmetics* (2nd Edition): Wiley-Interscience, Hoboken, NJ, USA, 649 p.

Lopes GC, Sanches ACC, Nakamura CV, Dias Filho BP, Hernandes LM, de Mello JCP 2005. Influence of extracts of *Stryphnodendron polyphyllum* Mart. and *Stryphnodendron obovatum* Benth. on the cicatrisation of cutaneous wounds in rats. *J Ethnopharmacol 99*: 265-272.

Marensi V 2004. *Levantamento bibliográfico de espécies botânicas de aplicação tópica e as com potencial cosmético - com ênfase as pertencentes à Floresta Atlântica*. Itajaí, 265p. Trabalho de Conclusão de Curso - Graduação em Farmácia, Universidade do Vale do Itajaí.

Mendonça-Filho RFW, Menezes FS 2003. Estudo da utilização de plantas medicinais pela população da Ilha Grande-RJ. *Rev Bras Farmacogn 13(Supl)*: 55-58.

Missouri Botanical Garden 2003. Missouri Botanical Garden-w3 TROPICOS Nomenclatural Data Base.

Moraes MS 1986. Considerações sobre a pariparoba oficial *Pothomorphe umbellata* (L.) Miq. *Rev Bras Farmacogn 1*: 101-108.

Morais SM, Dantas JDP, Silva ARA, Magalhães EF 2005. Plantas medicinais usadas pelos índios Tapebas do Ceará. *Rev Bras Farmacogn 15*: 169-177.

Noonan WP, Noonan C 2004. Legal requirements for "functional food" claims. *Toxicol Lett 150*: 19-24.

Pieroni A, Quave CL, Villanelli ML, Mangino P, Sabbatini G, Santini L, Boccetti T, Profili M, Ciccioli T, Rampa LG 2004. Ethnopharmacognostic survey on the natural ingredients used in folk cosmetics, cosmeceuticals and remedies for healing skin diseases in the inland Marches, Central-Eastern Italy. *J Ethnopharmacol 91*: 331-344.

Ropke CD, Kaneko TM, Rodrigues RM, Silva VV, Barros S, Sawada TC, Kato MJ, Barros SB 2002. Evaluation of percutaneous absorption of 4-nerolidylcathecol from four topical formulations. *Int J Pharmacol 249*: 109-116.

Ropke CD, Meirelles RR, Silva VV, Sawada TCH, Barros SBM 2003. *Pothomorphe umbellata* extract prevents α-tocopherol depletion after UV-irradiation. *Photochem Photobiol 78*: 436-439.

Sant'Ana PJP 2002. *A bioprospecção no Brasil - Contribuições para uma gestão ética*. Brasília: Paralelo 15.

Souza GC, Haas AP, von Poser GL, Schapoval EE, Elisabetsky E 2004. Ethnopharmacological studies of antimicrobial remedies in the south of Brazil. *J Ethnopharmacol 90*: 135-143.

Souza TM, Moreira RRD, Pietro RCLR, Isaac VLB 2007. Avaliação da atividade anti-séptica de extrato seco de *Stryphnodendron adstringens* (Mart.) Coville e de preparação cosmética contendo este extrato. *Rev Bras Farmacogn 17*: 71-75.

The Plant Names Project 1999. The Jepson Herbarium. University of California, Berkeley, (http://ucjeps.berkeley.edu/about_ICPN.html).