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BEES AND MELITTOPHILOUS PLANTS OF SECONDARY ATLANTIC FOREST HABITATS AT SANTA CATARINA ISLAND, SOUTHERN BRAZIL

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ABSTRACT

The present study contributes to the knowledge of the apifauna and its food sources on the Santa Catarina Island, SC, southern Brazil. Bees and their food sources were recorded through non-systematic collections, between November 1999 and April 2008, in several environments on the island. A total of 169 species of bees were captured on 126 species of melittophilous plants. The majority of plants recorded are subshrub and shrub species, with only nine species of trees. 91% of the bee species were collected on native plants, which represent 64% of the plant species, while only seven species of bees (4%) were captured exclusively on exotic plants (27% of the plant species). In our study, we show the importance of non-arboreal native plants in maintaining a rich diversity of bees and we indicate plant species that can be used as target species in rapid surveys of the subtropical apifauna in Brazil. The spectrum of species with oligolectic habits and their pollen sources as well as the recording of new food sources for rare species in surveys of bees on flowers are discussed.

Key-words: Bee-plant interaction; melittophilous plants; apifauna; subtropical Brazil.

RESUMO

ABELHAS E PLANTAS MELITÓFILAS DE HABITATS SECUNDÁRIOS DE MATA ATLÂNTICA NA ILHA DE SANTA CATARINA, SUL DO BRASIL. O presente estudo contribui para os conhecimentos da fauna apícola e suas fontes de alimentos na Ilha de Santa Catarina, SC, sul do Brasil. Através de coletas não-sistemáticas, entre novembro de 1999 e abril de 2008, em vários ambientes da Ilha, foram registradas abelhas e suas respectivas fontes alimentares. No total, 169 espécies de abelhas foram capturadas em 126 espécies de plantas melitófilas. Destas, apenas nove espécies são árvores, prevalecendo espécies subarbustivas e arbustivas. 91% das espécies de abelhas foram coletadas em plantas nativas, que corresponderam a 64% das espécies vegetais, enquanto apenas sete espécies de abelhas (4%) foram capturadas exclusivamente em plantas exóticas (27% das espécies vegetais). Neste trabalho ficou evidente a importância de plantas não-arbóreas nativas na manutenção de uma rica diversidade de abelhas, além de indicar espécies vegetais que podem ser utilizadas como espécies-alvo em levantamentos rápidos da apifauna subtropical no Brasil. Discutiu-se o espectro de espécies com hábitos oligoléticos e seus respectivos recursos polínicos, bem como o registro de novas fontes alimentares para espécies raras em levantamentos de abelhas em flores.

Palavras-chave: Interação abelhas-plantas, flora melitófila, apifauna, Brasil subtropical.

RESUMEN

ABEJAS Y PLANTAS MELITÓFILAS DE HÁBITATS DEL BOSQUE ATLÁNTICO SECUNDARIO EN LA ISLA DE SANTA CATARINA, SUR DE BRASIL. Este estudio aporta al conocimiento de la fauna

apícola y sus fuentes de alimentos en la Isla de Santa Catarina, SC, al sur de Brasil. Por medio de colectas no sistemáticas, entre noviembre de 1999 y abril de 2008, en varios ambientes de la isla, se registraron abejas y sus respectivas fuentes de alimento. Se capturaron 169 especies de abejas en 126 especies de plantas melitófilas. De éstas sólo 9 son árboles, prevaleciendo especies subarbustivas y arbustivas. El 91 % de las especies de abejas fueron colectadas en plantas nativas, que corresponden al 64% de las especies vegetales, mientras que sólo 7 especies de abejas (4%) fueron capturadas en plantas exóticas (27 % de las especies vegetales). Este trabajo hizo evidente la importancia de las plantas no arbóreas nativas para el mantenimiento de una rica diversidad de abejas, además de mostrar las especies vegetales que pueden ser usadas como especies blanco en evaluaciones rápidas de apifauna subtropical en Brasil. Se discute el espectro de especies con hábitos oligolécticos y sus respectivos recursos polínicos, así como el registro de nuevas fuentes de alimento para especies raras en evaluaciones de abejas en flores.

Palabras clave: Interacción abejas-planta, flora melitófila, apifauna, Brasil subtropical.

INTRODUCTION

A rich bee-flower relationship is observed at tropical areas and therefore bees are considered the main pollinators of angiosperms in these sites. In Brazil, besides a high number of bee inventories performed at different habitats and a good knowledge about the apifauna, relatively little is known about the food resources explored by local bee communities. Information about the spectrum of bee visitors to the great majority of melittophilous plants is available only for some restricted areas (see Aguiar 2003).

From 26 studies about bee communities in various ecosystems in the subtropical states of southern Brazil, seven were performed in Santa Catarina (see Alves-dos-Santos 2007, Krug & Alves-dos-Santos 2008). However, for Santa Catarina only two of these studies were published in scientific journals (Steiner *et al.* 2006, Krug & Alves-dos-Santos 2008) but none with information about the plants visited by the foraging bees.

The data we present here resulted from an eight year non-systematic collection of bees and the plants used as food resources in the Atlantic rain forest of Santa Catarina Island. We present the melittophilous plants visited by 134 from a total of 166 bee species listed by Steiner *et al.* (2006) and additional records since then, further new bee records for Santa Catarina Island as well as for the state of Santa Catarina. Although no community analysis is made due the non-systematic collection of bees, the association of melittophilous plants used as food resources by a rich bee community at Santa Catarina Island provides the first data about the potential pollinators of most of these plant species as well as the role of non-arboreal native plants for the conservation of the local apifauna in the Atlantic forest of Santa Catarina.

MATERIAL AND METHODS

STUDY AREA

Bees and plants were sampled at Santa Catarina Island (27°22'–27°50' S, 48°25'–48°35' W), in the city of Florianópolis, state of Santa Catarina, southern Brazil. This island occupies 425 km^2 in the south of the "Domínio Mata Atlântica" and was originally covered by tropical rain forest (70%), restinga (20%), and mangrove (10%). These plant formations were largely destroyed by European colonization, and today there is predominance of secondary vegetations, where we performed all the bee collections in several habitat types and plant communities: disturbed forests, early successional forest stages, beach and dune vegetation (restinga), pastures, road margins, suburban and urban areas, and gardens with exotic ornamental plants (see phytogeographic map in Steiner *et al*. 2006). Collection of bees was opportunistic and not focused on the study of a specific habitat. According to Köppen classification, the local climate is Cfa: mesotermic and humid, without a dry season (Caruso 1983).

SAMPLING

Bees and plants were collected from November 1999 to April 2008. The bee specimens were captured with entomological nets on flowers. Identification

of the bees was performed by bee taxonomists. Bees identified to genus only are numbered as morphospecies according to the corresponding species of the reference collection at the laboratory of J. Steiner, UFSC, Florianópolis, Brazil (following Steiner *et al.* 2006), so that discontinuities in the numbering imply that no flower record is available for that morphospecies or that it was not recorded at Santa Catarina Island. The plant species were identified in the field or later by comparison with herbarium specimens or photos. Plants were classified following Cronquist (1988). The exotic honey bee *Apis mellifera* was not considered in this study. Bee specimens were deposited in the collection of Josefina Steiner, Biology Department, and the herbarium specimens are deposited at the Herbário FLOR, Botany Department, both of the Federal University of Santa Catarina.

RESULTS AND DISCUSSION

Approximately 1,350 individuals belonging to 169 bee species of 63 genera of five families (Andrenidae, Apidae, Colletidae, Halictidae and Megachilidae) (Table 1) were collected at 126 species of 39 plant families (Table 2).

Table 1. List of bee species and the plant families and species on which these bees were captured at Santa Catarina Island between November 1999 and April 2008. * New record for Santa Catarina state.

Bee species/ Plant family	Plant species
ANDRENIDAE	
Acamptopoeum prinii	
Asteraceae	*Bidens pilosa*
Malvaceae	*Sida carpinifolia*
***Callonychium* sp.**	
Convolvulaceae	*Ipomoea* sp.
Solanaceae	*Petunia littoralis*
Parapsaenythia serripes	
Fabaceae	*Mimosa pudica*
Psaenythia bergii	
Asteraceae	*Baccharis spicata*
Lamiaceae	*Marsypianthes chamaedrys*
Malvaceae	*Pavonia sepium*
Melastomataceae	*Rhynchanthera cordata*
Polygonaceae	*Polygonum punctatum*
APIDAE	
Bombus* (*Fervidobombus*) *brasiliensis	
Bromeliaceae	*Aechmea caudata, A. lindenii, A. nudicaulis*
Bombus* (*Fervidobombus*) *morio	
Asteraceae	*Tithonia diversifolia*, *Vernonia tweedieana*
Bignoniaceae	*Podranea ricasoliana*
Bromeliaceae	*Aechmea caudata, A. lindenii, A. nudicaulis, Neoregelia laevis*
Commelinaceae	*Dichorisandra thyrsiflora*
Convolvulaceae	*Ipomoea pes-caprae*, *Ipomoea* sp.
Fabaceae	*Albizia* sp., *Macroptilium atropurpureum, Mimosa bimucronata, M. pudica*, *Senna macranthera*, *Senna* cf. *tropica*
Lamiaceae	*Coleus barbatus*
Myrtaceae	*Myrciaria glazioviana*
Rosaceae	*Rosa* sp.
Verbenaceae	*Stachytarphaeta cayennensis, Vitex megapotamica*
Bombus* (*Fervidobombus*) *pauloensis (as *B. atratus* in Steiner *et al*. 2006)	
Bromeliaceae	*Aechmea lindenii*, *A. nudicaulis, Neoregelia laevis*, *Nidularium innocentii,*
Fabaceae	*Mimosa bimucronata*

Continuation of Table I.

Eufriesea smaragdina (as *Eufriesea* sp. in Steiner *et al*. 2006)	
Convolvulaceae	*Ipomoea* cf. *purpurea*
Fabaceae	*Canavalia rosea, Chamaecrista desvauxii, Crotalaria spectabilis*
Malvaceae	*Hibiscus pernambucensis*
Eufriesea violacea	
Convolvulaceae	*Ipomoea* sp.
Fabaceae	*Senna* cf. *tropica*
Marantaceae	*Calathea* sp.
Rosaceae	*Rosa* sp.
Euglossa (Euglossa) anodorhynchi (as *E. analis* in Steiner *et al*. 2006)	
Bromeliaceae	*Aechmea caudata, A. nudicaulis*
Commelinaceae	*Dichorisandra thyrsiflora*
Convolvulaceae	*Ipomoea* cf. *purpurea*, *Ipomoea* sp.
Lamiaceae	*Coleus barbatus*
Rosaceae	*Rosa* sp.
Rubiaceae	*Pentas lanceolata*
Euglossa* (*Glossura*) *annectans (as *E. stellfeldi* in Steiner *et al*. 2006)	
Bromeliaceae	*Aechmea caudata, A. lindenii, A. nudicaulis, A. ornata, Bromelia antiacantha, Neoregelia laevis*, *Nidularium innocentii, Vriesea philippocoburgii*
Commelinaceae	*Dichorisandra thyrsiflora*
Convolvulaceae	*Ipomoea* sp.
Marantaceae	*Calathea* sp.
Rubiaceae	*Pentas lanceolata*
Verbenaceae	*Holmskioldia sanguinea*
Melipona marginata	
Anacardiaceae	*Schinus terebinthifolius*
Asteraceae	*Baccharis spicata*, *Eupatorium* sp., *Wedelia trilobata*
Euphorbiaceae	*Julocroton ramboi*
Rubiaceae	*Diodia apiculata*
Melipona quadrifasciata	
Asteraceae	*Baccharis spicata*
Plebeia droryana	
Acanthaceae	*Thunbergia grandiflora*
Anacardiaceae	*Schinus terebinthifolius*
Asteraceae	*Baccharis microdonta, B. spicata, Baccharis* sp., *Bidens pilosa, Tagetes minuta, Vernonia tweedieana,*
Balsaminaceae	*Impatiens walleriana*
Bromeliaceae	*Aechmea caudata, A. lindenii, A. nudicaulis, A. ornata, Tillandsia* sp., *Vriesea philippocoburgii*
Ericaceae	*Rhododendron simsii*
Euphorbiaceae	*Euphorbia* sp.
Fabaceae	*Senna multijuga*
Lamiaceae	*Salvia splendens*
Liliaceae	*Crinum erubescens*
Malvaceae	*Malvaviscus arboreus*
Myrtaceae	*Psidium guajava*
Rubiaceae	*Pentas lanceolata*
Solanaceae	*Brugmansia suaveolens*
Tropaeolaceae	*Tropaeolum majus*
Plebeia emerina	
Asteraceae	*Baccharis microdonta, B. spicata*
Plebeia remota	
Anacardiaceae	*Schinus terebinthifolius*
Asteraceae	*Baccharis spicata, Baccharis* sp., *Eupatorium bupleurifolium, Vernonia tweedieana*
Balsaminaceae	*Impatiens walleriana*
Bromeliaceae	*Aechmea lindenii*
Polygonaceae	*Polygonum punctatum*

Continuation of Table I.

Scaptotrigona bipunctata	
Anacardiaceae	*Schinus terebinthifolius*
Asteraceae	*Baccharis spicata*
Schwarziana quadripunctata	
Asteraceae	*Baccharis spicata, Baccharis* sp.
Tetragonisca angustula	
Ericaceae	*Rhododendron simsii*
Euphorbiaceae	*Euphorbia milii*
Lythraceae	*Lagerstroemia indica*
Trigona spinipes	
Acanthaceae	*Thunbergia erecta*, *T. grandiflora*
Anacardiaceae	*Schinus terebinthifolius*
Asclepiadaceae	*Asclepias curassavica*
Asteraceae	*Bidens pilosa, Erechtites hieraciifolius, Mikania cordifolia, Trixis praestans*
Bromeliaceae	*Aechmea caudata, A. lindenii, A. nudicaulis*
Cactaceae	*Schlumbergera truncata*
Convolvulaceae	*Merremia* sp.
Euphorbiaceae	*Euphorbia milii*
Fabaceae	*Calliandra tweediei, Mimosa pudica, Senna multijuga, Senna* cf. *tropica*
Lamiaceae	*Salvia splendens*
Loranthaceae	*Struthanthus* sp.
Malvaceae	*Pavonia sepium, Sida rhombifolia*
Melastomataceae	*Rhynchanthera cordata, Tibouchina urvilleana*
Polygonaceae	*Polygonum punctatum*
Tiliaceae	*Corchorus* cf. *hirtus*
Verbenaceae	*Holmskioldia sanguinea*
Partamona criptica *	
Fabaceae	*Senna* cf. *tropica*
Partamona helleri	
Myrtaceae	*Eugenia uniflora*
Centris* (*Centris*) *decolorata (as *Centris* (C.) *leprieuri* in Steiner *et al.* 2006)	
Convolvulaceae	*Ipomoea pes-caprae*
Melastomataceae	*Tibouchina urvilleana*
Verbenaceae	*Stachytarpheta cayennensis*
Centris* (*Centris*) *varia	
Verbenaceae	*Stachytarpheta cayennensis*
***Centris* (*Centris*) sp.1**	
Verbenaceae	*Stachytarpheta cayennensis*
Centris* (*Hemisiella*) *tarsata	
Verbenaceae	*Stachytarpheta cayennensis, Vitex megapotamica*
Centris* (*H.*) *vulpecula	
Fabaceae	*Caesalpinia peltophoroides*
Verbenaceae	*Vitex megapotamica*
Centris* (*Melacentris*) *obsoleta	
Melastomataceae	*Rhynchanthera cordata*
Centris* (*Trachina*) *proxima	
Fabaceae	*Caesalpinia peltophoroides, Senna* cf. *tropica*
Centris* (*Trachina*) *similis *	
Fabaceae	*Senna* cf. *tropica*
Epicharis* (*Anepicharis*) *dejeanii	
Fabaceae	*Senna* cf. *tropica*
Verbenaceae	*Stachytarpheta cayennensis, Vitex megapotamica*
Epicharis (Epicharoides) picta (as *E. (Epicharoides) grandior* in Steiner *et al.* 2006)	
Verbenaceae	*Stachytarpheta cayennensis*

Continuation of Table I.

Ancyloscelis apiformis	
Convolvulaceae	*Ipomoea* sp., *Merremia* sp.
Melitoma segmentaria	
Convolvulaceae	*Ipomoea pes-caprae, I.* cf. *purpurea, Ipomoea* sp.
Ptilothrix relata	
Convolvulaceae	*Ipomoea* sp.
***Triepeolus* cf. *alvarengai* ***	
Asteraceae	*Wedelia trilobata*
***Trophocleptria* sp.1**	
Asteraceae	*Vernonia scorpioides*
Mesonychium littoreum	
Convolvulaceae	*Ipomoea pes-caprae*
Florilegus festivus	
Asteraceae	*Bidens pilosa*
Verbenaceae	*Stachytarpheta cayennensis*
Melissodes nigroaenea	
Asteraceae	*Baccharis* sp., *Solidago chilensis, Vernonia tweedieana, Wedelia trilobata*
Convolvulaceae	*Ipomoea* sp.
Malvaceae	*Pavonia sepium*
Myrtaceae	*Psidium cattleyanum*
Melissoptila bonaerensis	
Asteraceae	*Vernonia tweedieana, Vernonia* sp.
Convolvulaceae	*Ipomoea* sp.
Onagraceae	*Ludwigia octovalvis, L. peruviana*
Oxalidaceae	*Oxalis rhombeo-ovata*
Melissoptila paraguayensis	
Onagraceae	*Ludwigia octovalvis*
Melissoptila setigera	
Onagraceae	*Ludwigia octovalvis, L. peruviana*
Polygonaceae	*Polygonum punctatum*
Thygater* (*Thygater*) *analis	
Asteraceae	*Bidens pilosa*
Convolvulaceae	*Ipomoea pes-caprae, Ipomoea* sp.
Verbenaceae	*Stachytarpheta cayennensis*
***Thygater* (*Thygater*) *armandoi* ***	
Bignoniaceae	*Podranea ricasoliana*
Exomalopsis* (*Exomalopsis*) *analis	
Asteraceae	*Bidens pilosa, Trixis praestans*
Lamiaceae	*Marsypianthes chamaedrys*
Exomalopsis* (*Exomalopsis*) *auropilosa	
Asteraceae	*Bidens pilosa, Vernonia tweedieana*
Solanaceae	*Solanum americanum*
Verbenaceae	*Stachytarpheta cayennensis*
Exomalopsis* (*Exomalopsis*) cf. *tomentosa	
Anacardiaceae	*Schinus terebinthifolius*
Asteraceae	*Mikania cordifolia*, *Trixis praestans*
Exomalopsis* (*Phanomalopsis*) *trifasciata	
Fabaceae	*Inga* sp.
Melastomataceae	*Rhynchanthera cordata*
***Nomada* sp.2**	
Asteraceae	*Bidens pilosa*
Protosiris gigas	
Bromeliaceae	*Neoregelia laevis*
Verbenaceae	*Stachytarpheta cayennensis*
***Protosiris* sp.1**	
Verbenaceae	*Stachytarpheta cayennensis*
Leiopodus lacertinus	
Asteraceae	*Vernonia tweedieana*
Convolvulaceae	*Ipomoea* sp.
Verbenaceae	*Stachytarpheta cayennensis*

Continuation of Table I.

Arhysoceble picta	
Asteraceae	*Baccharis spicata, Vernonia tweedieana*
Convolvulaceae	*Ipomoea* sp.
Lamiaceae	*Marsypianthes chamaedrys*
Myrtaceae	*Psidium cattleyanum*
***Monoeca* sp. nov.**	
Verbenaceae	*Stachytarpheta cayennensis*
Paratetrapedia fervida	
Lamiaceae	*Leonurus japonicus*
Melastomataceae	*Rhynchanthera cordata*
Verbenaceae	*Stachytarpheta cayennensis*
Paratetrapedia volatilis	
Onagraceae	*Ludwigia peruviana*
Verbenaceae	*Lantana camara*
Trigonopedia ferruginea	
Myrtaceae	*Psidium guajava*
Rubiaceae	*Psychotria* sp.
Verbenaceae	*Stachytarpheta cayennensis*
Trigonopedia nigrifacies	
Myrtaceae	*Psidium guajava*
Coelioxoides* cf. *waltheriae	
Onagraceae	*Ludwigia octovalvis*
Tetrapedia diversipes	
Asteraceae	*Bidens pilosa*
Lamiaceae	*Leonurus japonicus*
Melastomataceae	*Rhynchanthera cordata*
Onagraceae	*Ludwigia octovalvis, L. peruviana*
Rubiaceae	*Richardia brasiliensis*
Verbenaceae	*Stachytarpheta cayennensis*
***Ceratina* (*Ceratinula*) sp.1**	
Asteraceae	*Eupatorium casarettoi*
Liliaceae	*Habranthus* sp.
***Ceratina* (*Ceratinula*) sp.3**	
Asteraceae	*Baccharis trimera*
Lamiaceae	*Marsypianthes chamaedrys*
Ceratina* (*Crewella*) *asuncionis	
Asteraceae	*Vernonia chamissonis*
Solanaceae	*Solanum americanum*
Ceratina* (*Crewella*) *darwinii	
Asteraceae	*Baccharis trimera*
Convolvulaceae	*Ipomoea* sp.
Ceratina* (*Crewella*) *richardsoniae	
Asteraceae	*Baccharis* sp., *Trixis praestans*, *Vernonia tweedieana, Vernonia* sp., *Wedelia trilobata*
Convolvulaceae	*Ipomoea* sp.
Lamiaceae	*Leonurus japonicus, Marsypianthes chamaedrys*
Liliaceae	*Habranthus* sp.
Polygonaceae	*Polygonum punctatum*
Rubiaceae	*Diodia apiculata, Pentas lanceolata*
***Ceratina* (*Crewella*) sp.2**	
Asteraceae	*Baccharis* sp., *Eupatorium casarettoi, Trixis praestans, Vernonia chamissonis, V. tweedieana, Vernonia* sp.
Fabaceae	*Mimosa bimucronata*
***Ceratina* (*Crewella*) sp.3**	
Anacardiaceae	*Schinus terebinthifolius*
Asteraceae	*Trixis praestans*
Convolvulaceae	*Ipomoea* sp.
***Ceratina* (*Rhysoceratina*) sp.1**	
Convolvulaceae	*Ipomoea pes-caprae*
Myrtaceae	*Campomanesia littoralis*

Continuation of Table I.

Xylocopa* (*Neoxylocopa*) *brasilianorum	
Acanthaceae	*Thunbergia grandiflora*
Asteraceae	*Erechtites hieraciifolius*
Bromeliaceae	*Aechmea lindenii, A. nudicaulis*
Commelinaceae	*Commelina erecta*
Fabaceae	*Caesalpinia peltophoroides, Senna macranthera, Senna* cf. *tropica*
Verbenaceae	*Vitex megapotamica*
Xylocopa* (*Neoxylocopa) frontalis	
Acanthaceae	*Thunbergia grandiflora*
Convolvulaceae	*Ipomoea* sp.
Fabaceae	*Senna* cf. *tropica*
Melastomataceae	*Rhynchanthera cordata*
Passifloraceae	*Passiflora edulis*
Xylocopa* (*Stenoxylocopa*) *artifex	
Bromeliaceae	*Aechmea lindenii, A. nudicaulis*
Commelinaceae	*Dichorisandra thyrsiflora*
Fabaceae	*Senna* cf. *tropica*
Onagraceae	*Ludwigia peruviana*
COLLETIDAE	
Colletes petropolitanus	
Asteraceae	*Baccharis spicata*
Colletes rugicollis	
Solanaceae	*Solanum* sp.
***Colletes* sp.**	
Asteraceae	*Baccharis* sp.
Cephalocolletes isabelae	
Cactaceae	*Opuntia monacantha*
Rubiaceae	*Diodia radula*
Caupolicana lugubris	
Verbenaceae	*Vitex megapotamica*
***Hylaeus* sp.1**	
Asteraceae	*Baccharis trimera*
***Hylaeus* sp.2**	
Asteraceae	*Mikania cordifolia, Vernonia tweedieana*
***Hylaeus* sp.3**	
Asteraceae	*Baccharis spicata*
***Hylaeus* sp.4**	
Asteraceae	*Baccharis spicata*
***Hylaeus* sp.7**	
Asteraceae	*Baccharis trimera*
***Hylaeus* sp.13**	
Anacardiaceae	*Schinus terebinthifolius*
Hexantheda enneomera	
Amaranthaceae	*Blutaparon portulacoides*
Solanaceae	*Petunia littoralis*
***Tetraglossula* sp.2**	
Onagraceae	*Ludwigia octovalvis*
HALICTIDAE	
Augochlora* (*Augochlora*) *amphitrite	
Asteraceae	*Vernonia chamissonis, V. tweedieana, Vernonia* sp.
Convolvulaceae	*Ipomoea pes-caprae, Ipomoea* sp.
Fabaceae	*Calliandra selloi*
Lamiaceae	*Marsypianthes chamaedrys*
Malvaceae	*Pavonia sepium*
Myrtaceae	*Psidium cattleyanum*
Onagraceae	*Ludwigia peruviana*
Oxalidaceae	*Oxalis rhombeo-ovata*
Rubiaceae	*Richardia brasiliensis*

Continuation of Table I.

***Augochlora* (*Augochlora*) *cydippe* ***	
Asteraceae	*Baccharis spicata*, *Baccharis* sp., *Solidago chilensis, Vernonia* sp.
***Augochlora* (*Augochlora*) *dolichocephala* ***	
Convolvulaceae	*Ipomoea* sp.
Euphorbiaceae	*Julocroton ramboi*
Onagraceae	*Ludwigia peruviana*
Augochlora* (*Augochlora*) *esox	
Asteraceae	*Bidens pilosa*, *Senecio confusus*, *Trixis praestans, Vernonia chamissonis, V. tweedieana,Vernonia* sp., *Wedelia trilobata*
Balsaminaceae	*Impatiens walleriana*
Bromeliaceae	*Aechmea lindenii, A. nudicaulis, Vriesea vagans*
Convolvulaceae	*Ipomoea pes-caprae, Ipomoea* cf. *purpurea, Ipomoea* sp., *Merremia* sp.
Fabaceae	*Calliandra tweediei*
Lamiaceae	*Marsypianthes chamaedrys*
Polygonaceae	*Polygonum punctatum*
Rubiaceae	*Diodia apiculata, Pentas lanceolata*
Tropaeolaceae	*Tropaeolum majus*
Verbenaceae	*Clerodendrum* sp., *Lantana camara, Stachytarpheta cayennensis*
Augochlora* (*Augochlora*) *foxiana	
Asteraceae	*Solidago chilensis, Vernonia tweedieana*
Melastomataceae	*Rhynchanthera cordata*
Onagraceae	*Ludwigia peruviana*
Augochlora* (*Augochlora*) *tantilla	
Asteraceae	*Baccharis* sp.
Fabaceae	*Calliandra tweediei*
Lamiaceae	*Marsypianthes chamaedrys*
Lythraceae	*Lagerstroemia indica*
Rubiaceae	*Pentas lanceolata*
Augochlora* (*Oxystoglossella*) *morrae	
Asteraceae	*Bidens pilosa, Vernonia* sp., *Wedelia trilobata*
Lamiaceae	*Marsypianthes chamaedrys*
Malvaceae	*Pavonia sepium*
Melastomataceae	*Rhynchanthera cordata*
Solanaceae	*Solanum americanum*
Verbenaceae	*Verbena bonariensis*
Augochlora* (*Oxystoglossella*) *semiramis	
Asteraceae	*Bidens pilosa, B. sulphurea, Emilia fosbergii, Erechtites hieraciifolius, Vernonia tweedieana, Vernonia* sp., *Wedelia trilobata*
Convolvulaceae	*Ipomoea* sp., *Merremia* sp.
Euphorbiaceae	*Euphorbia milii*
Lamiaceae	*Marsypianthes chamaedrys*
Malvaceae	*Sida carpinifolia, Sida* sp.
Myrtaceae	*Psidium guajava*
Rubiaceae	*Pentas lanceolata*
Solanaceae	*Solanum americanum*
Verbenaceae	*Stachytarpheta cayennensis, Verbena bonariensis*
***Augochlora* sp.1**	
Euphorbiaceae	*Julocroton ramboi*
***Augochlora* sp.2**	
Asteraceae	*Eupatorium casarettoi, Vernonia tweedieana*
***Augochlora* sp.5**	
Onagraceae	*Ludwigia peruviana*
***Augochlora* sp.10**	
Asteraceae	*Vernonia chamissonis*
***Augochlora* sp.11**	
Lamiaceae	*Ocimum basilicum*
***Augochlora* sp.13**	
Asteraceae	*Vernonia tweedieana*
Convolvulaceae	*Ipomoea* sp.
Oxalidaceae	*Oxalis rhombeo-ovata*

Continuation of Table I.

***Augochlorella ephyra* (** as *A. michaelis* in Steiner *et al*. 2006)	
Asteraceae	*Baccharis spicata, Bidens pilosa, Emilia fosbergii, Erechtites valerianifolius, Vernonia* sp., *Wedelia trilobata*
Euphorbiaceae	*Euphorbia milii*
Gesneriaceae	*Sinningia* sp.
Lamiaceae	*Marsypianthes chamaedrys, Salvia splendens*
Solanaceae	*Solanum americanum*
Augochloropsis caerulans	
Asteraceae	*Bidens pilosa, Erechtites hieraciifolius*, *E. valerianifolius*, *Vernonia tweedieana*
Begoniaceae	*Begonia* sp.
Augochloropsis chloera *	
Anacardiaceae	*Schinus terebinthifolius*
Asteraceae	*Baccharis* sp.
Loranthaceae	*Struthanthus* sp.
Augochloropsis* aff. *cleopatra (as *A. sparsilis* in Steiner *et al*. (2006)	
Asteraceae	*Bidens pilosa, Erechtites hieraciifolius, Wedelia trilobata*
Poaceae	*Zea mays*
Polygonaceae	*Polygonum punctatum*
Verbenaceae	*Stachytarpheta cayennensis*
Augochloropsis cognata	
Asteraceae	*Baccharis spicata, B. trimera, Bidens pilosa, Emilia fosbergii, Senecio confusus, Vernonia chamissonis, V. tweedieana, Wedelia trilobata*
Boraginaceae	*Cordia monosperma*
Bromeliaceae	*Aechmea lindenii*
Convolvulaceae	*Ipomoea* sp.
Cucurbitaceae	*Cucurbita* sp.
Euphorbiaceae	*Euphorbia milii, Euphorbia* sp., *Julocroton ramboi*
Fabaceae	*Calliandra tweediei*
Lamiaceae	*Salvia splendens*
Loranthaceae	*Struthanthus* sp.
Malvaceae	*Pavonia sepium*
Onagraceae	*Ludwigia octovalvis*
Polygonaceae	*Polygonum punctatum*
Rubiaceae	*Pentas lanceolata*
Tiliaceae	*Corchorus* cf. *hirtus*
Verbenaceae	*Vitex megapotamica*
Augochloropsis euterpe	
Asteraceae	*Bidens pilosa, Erechtites hieraciifolius*
Euphorbiaceae	*Euphorbia* sp.
Solanaceae	*Solanum americanum*
Augochloropsis sparsilis	
Anacardiaceae	*Schinus terebinthifolius*
Asteraceae	*Baccharis spicata, Baccharis* sp.
Euphorbiaceae	*Euphorbia milii*
Loranthaceae	*Struthanthus* sp.
Malvaceae	*Pavonia sepium*
Myrtaceae	*Eugenia uniflora*
Polygonaceae	*Polygonum punctatum*
Augochloropsis sympleres	
Asteraceae	*Vernonia chamissonis, V. tweedieana, Vernonia* sp., *Wedelia trilobata*
Melastomataceae	*Tibouchina urvilleana*
Polygonaceae	*Polygonum punctatum*
***Augochloropsis* sp.1**	
Asteraceae	*Bidens pilosa, Solidago chilensis, Vernonia tweedieana*
Onagraceae	*Ludwigia octovalvis*
Polygonaceae	*Polygonum punctatum*
***Augochloropsis* sp.2**	
Asteraceae	*Vernonia chamissonis*
Melastomataceae	*Rhynchanthera cordata*

Continuation of Table I.

***Augochloropsis* sp. 11**	
Asteraceae	*Vernonia chamissonis*
Polygonaceae	*Polygonum punctatum*
***Augochloropsis* sp. 15**	
Asteraceae	*Vernonia chamissonis*
Neocorynura erinnys	
Asteraceae	*Solidago chilensis*
Fabaceae	*Mimosa bimucronata*
Neocorynura oiospermi	
Asteraceae	*Mikania cordifolia*
Loranthaceae	*Struthanthus* sp.
***Neocorynura* sp. 1**	
Asteraceae	*Vernonia tweedieana*
***Neocorynura* sp. 2**	
Asteraceae	*Solidago chilensis*
Pereirapis rhizophila	
Polygonaceae	*Polygonum punctatum*
Pseudaugochlora graminea	
Asteraceae	*Baccharis trimera, Bidens pilosa, Erechtites hieraciifolius, Mikania cordifolia, Trixis praestans*
Balsaminaceae	*Impatiens walleriana*
Bromeliaceae	*Aechmea nudicaulis*
Fabaceae	*Calliandra tweediei, Senna multijuga, Senna* cf. *tropica*
Lamiaceae	*Salvia splendens*
Rubiaceae	*Pentas lanceolata*
Verbenaceae	*Clerodendrum thomsoniae, Clerodendrum* sp., *Stachytarpheta cayennensis*
***Temnosoma* sp.1**	
Loranthaceae	*Struthanthus* sp.
Polygonaceae	*Polygonum punctatum*
Thectochlora hamata (as *T. alata* in Steiner *et al.* 2006)	
Asteraceae	*Bidens pilosa, Erechtites hieraciifolius, Senecio crassiflorus*
Rubiaceae	*Diodia radula*
Solanaceae	*Cyphomandra littoralis*, *Solanum americanum*
Verbenaceae	*Stachytarpheta cayennensis, Vitex megapotamica*
Agapostemon chapadensis	
Asteraceae	*Mikania cordifolia, Solidago chilensis, Trixis praestans, Vernonia tweedieana, Vernonia* sp.
Polygonaceae	*Polygonum punctatum*
Agapostemon semimelleus	
Asteraceae	*Bidens pilosa, Mikania cordifolia, Vernonia tweedieana, Vernonia* sp.
Solanaceae	*Solanum americanum*
***Caenohalictus incertus* ***	
Anacardiaceae	*Schinus terebinthifolius*
***Caenohalictus* sp.2**	
Bromeliaceae	*Aechmea caudata*
Dialictus opacus	
Anacardiaceae	*Schinus terebinthifolius*
Aquifoliaceae	*Ilex dumosa*
Asteraceae	*Baccharis* sp., *Bidens pilosa, Galinsoga parviflora*, *Tagetes minuta*
Convolvulaceae	*Ipomoea pes-caprae*
Euphorbiaceae	*Euphorbia milii*
Fabaceae	*Inga* sp.
Polygonaceae	*Polygonum punctatum*
Rosaceae	*Rosa* sp.
Solanaceae	*Cyphomandra littoralis*
Verbenaceae	*Vitex megapotamica*
***Dialictus* sp.1**	
Asteraceae	*Baccharis spicata, Wedelia trilobata*
Loranthaceae	*Struthanthus* sp.

Continuation of Table I.

***Dialictus* sp.2**	
Anacardiaceae	*Schinus terebinthifolius*
Lythraceae	*Lagerstroemia indica*
Solanaceae	*Solanum americanum*
***Dialictus* sp. 3**	
Asteraceae	*Baccharis* sp.
Moraceae	*Ficus pumila*
***Dialictus* sp. 11**	
Asteraceae	*Baccharis* sp.
***Dialictus* sp. 12**	
Asteraceae	*Baccharis* sp.
Convolvulaceae	*Ipomoea pes-caprae*
Myrtaceae	*Campomanesia littoralis*
Rubiaceae	*Diodia radula*
***Dialictus* sp.14**	
Asteraceae	*Galinsoga parviflora*
Euphorbiaceae	*Euphorbia milii*
Loranthaceae	*Struthanthus* sp.
Lythraceae	*Lagerstroemia indica*
Verbenaceae	*Clerodendrum* sp.
***Dialictus* sp.18**	
Anacardiaceae	*Schinus terebinthifolius*
Asteraceae	*Bidens pilosa*
***Dialictus* sp. 22**	
Asteraceae	*Baccharis* sp.
Pseudagapostemon* (*Pseudagapostemon) pissisi (as *P*. (*P*.) *brasiliensis* in Steiner *et al.* 2006)	
Lamiaceae	*Marsypianthes chamaedrys*
Verbenaceae	*Vitex megapotamica*
Pseudagapostemon* (*Pseudagapostemon) hurdi	
Anacardiaceae	*Schinus terebinthifolius*
Asteraceae	*Baccharis* sp., *Vernonia* sp.
Convolvulaceae	*Ipomoea pes-caprae*
Solanaceae	*Petunia littoralis*
***Sphecodes* sp.1**	
Solanaceae	*Cyphomandra littoralis*
MEGACHILIDAE	
Anthidium manicatum	
Lamiaceae	*Leonurus japonicus*
Anthidium sertanicola	
Asteraceae	*Baccharis* sp.
Austrostelis iheringi	
Onagraceae	*Ludwigia octovalvis*
Hypanthidium divaricatum	
Asteraceae	*Baccharis spicata*, *Baccharis* sp., *Erechtites valerianifolius, Vernonia chamissonis, V. tweedieana*
Lamiaceae	*Leonurus japonicus, Marsypianthes chamaedrys*
Onagraceae	*Ludwigia octovalvis*
Oxalidaceae	*Oxalis rhombeo-ovata*
Polygonaceae	*Polygonum punctatum*
Rubiaceae	*Diodia apiculata*
Saranthidium furcatum	
Rubiaceae	*Richardia brasiliensis*
Coelioxys* (*Acrocoelioxys*) cf. *aculeaticeps	
Asteraceae	*Bidens pilosa*
Euphorbiaceae	*Julocroton ramboi*
Coelioxys* (*Acrocoelioxys*) cf. *otomita*	
Lamiaceae	*Marsypianthes chamaedrys*

Continuation of Table I.

Coelioxys* (*Acrocoelioxys*) *tolteca	
Asteraceae	*Vernonia* sp., *Wedelia trilobata*
Onagraceae	*Ludwigia octovalvis*
Verbenaceae	*Lantana camara*
Coelioxys* (*Cyrtocoelioxys*) cf. *quaerens*	
Malvaceae	*Pavonia sepium*
Onagraceae	*Ludwigia* sp.
Rubiaceae	*Diodia apiculata*
Verbenaceae	*Stachytarpheta cayennensis*
***Coelioxys (Cyrtocoelioxys)* sp.1**	
Anacardiaceae	*Schinus terebinthifolius*
Asteraceae	*Vernonia tweedieana, Vernonia* sp., *Wedelia trilobata*
Coelioxys (Neocoelioxys) simillima*	
Asteraceae	*Erechtites valerianifolius*
Coelioxys* (*Rhinocoelioxys*) *zapoteca	
Asteraceae	*Vernonia* sp.
Lamiaceae	*Marsypianthes chamaedrys*
Megachile (Austromegachile) susurrans	
Anacardiaceae	*Schinus terebinthifolius*
Asteraceae	*Vernonia tweedieana, Vernonia sp., Wedelia trilobata*
Lamiaceae	*Leonurus japonicus*
Myrtaceae	*Myrciaria glazioviana*
Onagraceae	*Ludwigia octovalvis*
Rubiaceae	*Diodia apiculata*
Megachile* (*Austromegachile*) *trigonaspis	
Asclepiadaceae	*Asclepias curassavica*
Megachile* (*Chrysosarus*) *pseudanthidioides	
Fabaceae	*Caesalpinia peltophoroides*
Verbenaceae	*Stachytarpheta cayennensis*
***Megachile* (*Chrysosarus*) sp.2**	
Asteraceae	*Vernonia tweedieana*
***Megachile* (*Dactylomegachile*) sp.2**	
Lamiaceae	*Marsypianthes chamaedrys*
***Megachile* (*Grafella*) sp.1**	
Asteraceae	*Baccharis* sp., *Vernonia tweedieana*
***Megachile* (*Grafella*) sp.2**	
Fabaceae	*Crotalaria pallida*
***Megachile* (*Leptorachis*) sp.1**	
Asteraceae	*Eupatorium casarettoi*
***Megachile* (*Leptorachis*) sp.2**	
Anacardiaceae	*Schinus terebinthifolius*
***Megachile* (*Leptorachis*) sp.3**	
Asteraceae	*Vernonia chamissonis, Wedelia trilobata*
Rubiaceae	*Diodia apiculata*
***Megachile* (*Leptorachis*) sp.4**	
Fabaceae	*Inga* sp.
***Megachile* (*Leptorachis*) sp.5**	
Asteraceae	*Vernonia* sp.
***Megachile* (*Melanosarus*) sp.1**	
Rubiaceae	*Richardia brasiliensis*
***Megachile* (*Melanosarus*) sp.3**	
Asteraceae	*Bidens pilosa*
***Megachile* (*Moureapis*) sp.1**	
Asteraceae	*Bidens pilosa, Erechtites hieraciifolius, Vernonia chamissonis, V. scorpioides, Vernonia* sp., *Wedelia trilobata*
Convolvulaceae	*Ipomoea* sp.
Solanaceae	*Solanum americanum*

Continuation of Table I.

Megachile* (*Pseudocentron*) *nudiventris	
Anacardiaceae	*Schinus terebinthifolius*
Asteraceae	*Baccharis spicata, Bidens pilosa*, *Eupatorium casarettoi, Mikania involucrata, Tithonia diversifolia, Vernonia chamissonis, V. tweedieana, Vernonia* sp., *Wedelia trilobata*
Myrtaceae	*Psidium cattleyanum*
Bromeliaceae	*Aechmea nudicaulis*
***Megachile* (*Pseudocentron*) sp.1**	
Asteraceae	*Eupatorium casarettoi, Wedelia trilobata*
***Megachile* (*Pseudocentron*) sp.2**	
Asteraceae	*Bidens pilosa*
***Megachile* (*Pseudocentron*) sp.3**	
Asteraceae	*Baccharis spicata, Baccharis* sp.
***Megachile (Ptilosaroides)* sp.1**	
Asteraceae	*Erechtites hieraciifolius*
***Megachile* (*Ptilosarus*) sp.1**	
Asteraceae	*Bidens pilosa, Vernonia tweedieana, Vernonia* sp.
Lamiaceae	*Marsypianthes chamaedrys*
***Megachile* (*Trichurochile*) sp.1**	
Asteraceae	*Trixis praestans*

Table 2. List of plant families and species in alphabetical order and the bee species collected at Santa Catarina Island between November 1999 and April 2008. Habit= B: bromeliad, E: hemiparasitic epiphyte, H: herb, L: liana, R: shrub, S: subshrub, T: tree. Origin= e: exotic in the Santa Catarina state, n: native, ?: origin unknown.

Plant family/species	Habit	Status	
ACANTHACEAE			
Thunbergia erecta	R	e	*Trigona spinipes*
Thunbergia grandiflora	L	e	*Plebeia droryana; Trigona spinipes; Xylocopa (Neoxylocopa) brasilianorum; X. (N). frontalis*
AMARANTHACEAE			
Blutaparon portulacoides	H	n	*Hexantheda enneomera*
ANACARDIACEAE			
Schinus terebinthifolius	T	n	*Augochloropsis chloera; A. sparsilis; Caenohalictus incertus; Ceratina (Crewella)* sp.3*; Coelioxys (Cyrtocoelioxys)* sp.1*; Dialictus opacus; D.* sp.2*; D.* sp.18*; Exomalopsis* (*E.*) cf. *tomentosa; Hylaeus* sp.13; *Megachile (Austromegachile) susurrans; M. (Leptorachis)* sp.2*; M. (Pseudocentron) nudiventris; Melipona marginata; Plebeia droryana; P. remota; Pseudagapostemon (P.) hurdi; Scaptotrigona bipunctata; Trigona spinipes*
AQUIFOLIACEAE			
Ilex dumosa	T	n	*Dialictus opacus*
ASCLEPIADACEAE			
Asclepias curassavica	S	n	*Megachile (Austromegachile) trigonaspis*; *Trigona spinipes*
ASTERACEAE			
Baccharis microdonta	R	n	*Plebeia droryana; P. emerina*
Baccharis spicata	S	n	*Arhysoceble picta; Augochlora (A.) cydippe; Augochlorella ephyra; Augochloropsis cognata; A. sparsilis; Colletes petropolitanus; Dialictus* sp.1*; Hylaeus* sp.3*; H.* sp.4*; Hypanthidium divaricatum; Megachile (Pseudocentron) nudiventris; M. (P.)* sp.3*; Melipona marginata; M. quadrifasciata; Plebeia droryana; P. emerina; P. remota; Psaenythia bergii; Scaptotrigona bipunctata; Schwarziana quadripunctata*

Continuation of Table 2.

Baccharis trimera	S	n	*Augochloropsis cognata; Ceratina (Ceratinula)* sp.3*; C. (Crewella) darwinii; Hylaeus* sp.1; *H.* sp.7; *Pseudaugochlora graminea*
Baccharis spp.	S	n	*Anthidium sertanicola; Augochlora (A.) cydippe; A.* (*A.*) *tantilla; Augochloropsis chloera; A. sparsilis; Callonychium sp.; Ceratina (Crewella) richardsoniae; C. (C.)* sp.2*; Colletes* sp.; *Dialictus opacus; D.* sp.3; *D.* sp.11; *D.* sp.12; *D.* sp.22; *Hypanthidium divaricatum; Megachile (Grafella)* sp.1*; M. (Pseudocentron)* sp.3; *Melissodes nigroaenea; Plebeia droryana; P. remota; Pseudagapostemon* (*P.*) *hurdi; Schwarziana quadripunctata*
Bidens pilosa	S	n	*Acamptopoeum prinii; Agapostemon semimelleus; Augochlora (A.) esox; A. (Oxystoglossella) morrae; A. (O.) semiramis; Augochlorella ephyra; Augochloropsis caerulans; A.* aff. *cleopatra; A. cognata; A. euterpe; A.* sp.1*; Coelioxys (Acrocoelioxys)* cf. *aculeaticeps; Dialictus opacus; D.* sp.18*; Exomalopsis (E.) analis; E. (E.) auropilosa; Florilegus festivus; Megachile (Moureapis)* sp.1*; M. (Melanosarus)* sp.3; *M. (Pseudocentron) nudiventris; M. (P.)* sp.2*; M. (Ptilosarus)* sp.1*; Nomada* sp.2*; Plebeia droryana; Pseudaugochlora graminea; Tetrapedia diversipes; Thectochlora hamata; Thygater (T.) analis; Trigona spinipes*
Bidens sulphurea	S	e	*Augochlora (Oxystoglossella) semiramis*
Emilia fosbergii	H	n	*Augochlora (Oxystoglossella) semiramis; Augochlorella ephyra; Augochloropsis cognata*
Erechtites hieraciifolius	H	n	*Augochlora (Oxystoglossella) semiramis; Augochloropsis caerulans; A.* aff. *cleopatra; A. euterpe; Megachile (Moureapis)* sp.1*; M. (Ptilosaroides)* sp.1*; Pseudaugochlora graminea; Thectochlora hamata; Trigona spinipes; Xylocopa (Neoxylocopa) brasilianorum*
Erechtites valerianifolius	H	n	*Augochlorella ephyra, Augochloropsis caerulans; Hypanthidium divaricatum; Coelioxys* (*Neocoelioxys*) *simillima*
Eupatorium bupleurifolium	R	n	*Plebeia remota*
Eupatorium casarettoi	S	n	*Augochlora* sp.2*; Ceratina (Ceratinula)* sp.1*; C. (Crewella)* sp.2*; Megachile (Leptorachis)* sp.1*; M. (Pseudocentron) nudiventris; M. (P.)* sp.1
Eupatorium sp.	?	n	*Melipona marginata*
Galinsoga parviflora	H	n	*Dialictus opacus; D.* sp.14
Mikania cordifolia	L	n	*Agapostemon chapadensis; A. semimelleus; Exomalopsis (E.)* cf. *tomentosa; Hylaeus* sp.2*; Neocorynura oiospermi; Pseudaugochlora graminea; Trigona spinipes;*
Mikania involucrata	L	n	*Megachile (Pseudocentron) nudiventris*
Senecio confusus	L	e	*Augochlora (A.) esox; Augochloropsis cognata*
Senecio crassiflorus	L	n	*Thectochlora hamata*
Solidago chilensis	S	n	*Agapostemon chapadensis; Augochlora* (*A.*) *cydippe; A. (A.) foxiana; Augochloropsis* sp.1*; Melissodes nigroaenea; Neocorynura erinnys; N.* sp.2
Tagetes minuta	S	n	*Dialictus opacus; Plebeia droryana*
Tithonia diversifolia	R	e	*Bombus* (*Fervidobombus*) *morio; Megachile (Pseudocentron) nudiventris*
Trixis praestans	R	n	*Agapostemon chapadensis; Augochlora (A.) esox; Ceratina (Crewella) richardsoniae; C. (C.)* sp.2*; C. (C.)* sp.3*; Exomalopsis (E.) analis; E.* (*E.*) cf. *tomentosa; Megachile (Trichurochile)* sp.1*; Pseudaugochlora graminea; Trigona spinipes*

Continuation of Table 2.

Vernonia chamissonis	S	n	*Augochlora* (*A.*) *amphitrite; A. (A.) esox; A.* sp.10*; Augochloropsis cognata; A. sympleres; A.* sp.2*; A.* sp.11*; A.* sp.15; *Ceratina (Crewella) asuncionis; C. (C.)* sp.2*; Hypanthidium divaricatum; Megachile (Leptorachis)* sp.3*; M. (Moureapis)* sp.1*; M. (Pseudocentron) nudiventris*
Vernonia scorpioides	S	n	*Megachile (Moureapis)* sp.1; *Trophocleptria* sp.1
Vernonia tweedieana	R	n	*Agapostemon chapadensis; A. semimelleus; Arhysoceble picta; Augochlora* (*A.*) *amphitrite; A. (A.) esox; A. (A.) foxiana; A. (Oxystoglossella) semiramis; A.* sp.2*; A.* sp.13*; Augochloropsis caerulans; A. cognata; A. sympleres; A.* sp.1*; Bombus (Fervidobombus) morio; Ceratina (Crewella) richardsoniae; C. (C.)* sp.2*; Coelioxys* (*Cyrtocoelioxys*) sp.1*; E. (E.) auropilosa; Hylaeus* sp.2*; Hypanthidium divaricatum; Leiopodus lacertinus; Megachile (Austromegachile) susurrans; M. (Chrysosarus)* sp.2*; M. (Grafella)* sp.1*; M. (Pseudocentron) nudiventris; M. (Ptilosarus)* sp.1*; Melissodes nigroaenea; Melissoptila bonaerensis; Neocorynura* sp.1*; Plebeia droryana; P. remota*
Vernonia sp. (specimens were not identified at species level but were in fact *V. chamissonis* or *V. tweedieana*)	?	n	*Agapostemon chapadensis; A. semimelleus; Augochlora (A.) amphitrite; A. (A.) cydippe; A. (A.) esox; A. (Oxystoglossella) morrae; A. (O.) semiramis; Augochlorella ephyra; Augochloropsis sympleres; Ceratina (Crewella) richardsoniae; C. (C.)* sp.2*; Coelioxys (Acrocoelioxys) tolteca; C.* (*Cyrtocoelioxys*) sp.1*; C. (Rhinocoelioxys) zapoteca; Megachile (Austromegachile) susurrans; M. (Leptorachis)* sp.5*; M. (Moureapis)* sp.1*; M. (Pseudocentron) nudiventris; M. (Ptilosarus)* sp.1*; Melissoptila bonaerensis; Pseudagapostemon (P.) hurdi*
Wedelia trilobata	S	?	*Augochlora (A.) esox; A. (Oxystoglossella) morrae; A. (O.) semiramis; Augochlorella ephyra; Augochloropsis* aff. *cleopatra; A. cognata; A. sympleres; Ceratina (Crewella) richardsoniae; Coelioxys (Acrocoelioxys) tolteca*; *C. (Cyrtocoelioxys)* sp.1; *Dialictus* sp.1; *Megachile (Austromegachile) susurrans*; *M. (Leptorachis)* sp.3; *M. (Moureapis)* sp.1; *M. (Pseudocentron) nudiventris; M. (P.)* sp.1; *Melipona marginata; Melissodes nigroaenea; Triepeolus alvarengai*
BALSAMINACEAE			
Impatiens walleriana	H	e	*Augochlora (A.) esox; Plebeia droryana; P. remota; Pseudaugochlora graminea*
BEGONIACEAE			
Begonia sp.	H	?	*Augochloropsis caerulans*
BIGNONIACEAE			
Podranea ricasoliana	L	e	*Bombus (Fervidobombus) morio; Thygater* (*T.*) *armandoi*
BORAGINACEAE			
Cordia monosperma	S	n	*Augochloropsis cognata*
BROMELIACEAE			
Aechmea caudata	B	n	*Bombus (Fervidobombus) morio*; *B. (F.) brasiliensis*; *Caenohalictus* sp.2; *Euglossa (Glossura) annectans; E. (E.) anodorhynchi; Plebeia droryana; Trigona spinipes*
Aechmea lindenii	B	n	*Augochlora (A.) esox; Augochloropsis cognata; Bombus (Fervidobombus) brasiliensis; B. (F.) morio; B. (F.) pauloensis; Euglossa (Glossura) annectans; Plebeia droryana; P. remota; Trigona spinipes; Xylocopa (Neoxylocopa) brasilianorum; X. (Stenoxylocopa) artifex*
Aechmea nudicaulis	B	n	*Augochlora (A.) esox; Bombus (Fervidobombus) brasiliensis; B. (F.) morio; B. (F.) pauloensis; Euglossa (Glossura) annectans; E. (E.) anodorhynchi; Megachile (Pseudocentron) nudiventris; Plebeia droryana; Pseudaugochlora graminea; Trigona spinipes; Xylocopa (Neoxylocopa) brasilianorum; X. (Stenoxylocopa) artifex*
Aechmea ornata	B	n	*Euglossa (Glossura) annectans*

Continuation of Table 2.

Bromelia antiacantha	B	n	*Euglossa (Glossura) annectans; Plebeia droryana*
Neoregelia laevis	B	n	*Bombus (Fervidobombus) morio; B. (F.) pauloensis; Euglossa (Glossura) annectans; Protosiris gigas*
Nidularium innocentii	B	n	*Bombus (Fervidobombus) pauloensis; Euglossa (Glossura) annectans*
Tillandsia sp.	B	n	*Plebeia droryana*
Vriesea philippocoburgii	B	n	*Euglossa (Glossura) annectans; Plebeia droryana*
Vriesea vagans	B	n	*Augochlora (A.) esox*
CACTACEAE			
Opuntia monacantha	R	n	*Cephalocolletes isabelae*
Schlumbergera truncata	S	e	*Trigona spinipes*
COMMELINACEAE			
Commelina erecta	H	?	*Xylocopa (Neoxylocopa) brasilianorum*
Dichorisandra thyrsiflora	S	?	*Bombus (Fervidobombus) morio; Euglossa (E.) anodorhynchi; E. (Glossura) annectans; Xylocopa (Stenoxylocopa) artifex*
CONVOLVULACEAE			
Ipomoea pes-caprae	L	n	*Augochlora* (*A.*) *amphitrite; A.* (*A.*) *esox; Bombus* (*Fervidobombus*) *morio; Centris* (*C.*) *decolorata; Ceratina* (*Rhysoceratina*) sp.1; *Dialictus opacus; D.* sp.12; *Melitoma segmentaria; Mesonychium littoreum; Pseudagapostemon (P.) hurdi; Thygater (T.) analis*
Ipomoea cf. *purpurea*	L	?	*Augochlora (A.) esox; Eufriesea smaragdina; Euglossa (E.) anodorhynchi; Melitoma segmentaria*
Ipomoea spp.	L	n	*Ancyloscelis apiformis; Arhysoceble picta; Augochlora (A.) amphitrite; A. (A.) esox; A. (A.) dolichocephala; A. (Oxystoglossella) semiramis; A.* sp.13; *Augochloropsis cognata; Bombus (Fervidobombus) morio; Callonychium* sp.; *Ceratina (Crewella) darwinii; C. (C.) richardsoniae; C. (C.)* sp.3*; Euglossa (E.) anodorhynchi; E. (Glossura) annectans; Eufriesea violacea; Leiopodus lacertinus; Megachile (Moureapis)* sp.1*; Melissodes nigroaenea; Melissoptila bonaerensis; Melitoma segmentaria; Ptilothrix relata; Thygater (T.) analis; Xylocopa (Neoxylocopa) frontalis*
Merremia sp.	L	n	*Ancyloscelis apiformis; Augochlora (A.) esox; A.* (*Oxystoglossella*) *semiramis*; *Trigona spinipes*
CUCURBITACEAE			
Cucurbita sp.	L	e	*Augochloropsis cognata*
ERICACEAE			
Rhododendron simsii	R	e	*Plebeia droryana; Tetragonisca angustula*
EUPHORBIACEAE			
Euphorbia milii	S	e	*Augochlora (Oxystoglossella) semiramis; Augochlorella ephyra; Augochloropsis cognata; A. sparsilis; Dialictus opacus; D.* sp.14*; Tetragonisca angustula; Trigona spinipes*
Euphorbia sp.	S	?	*Augochloropsis cognata; A. euterpe; Plebeia droryana*
Julocroton ramboi	R	n	*Augochlora* (*A.*) *dolichocephala; A.* sp.1*; Augochloropsis cognata; Coelioxys (Acrocoelioxys)* cf. *aculeaticeps; Melipona marginata*

Continuation of Table 2.

FABACEAE			
Albizia sp.	T	e	*Bombus (Fervidobombus) morio*
Caesalpinia peltophoroides	R	e	*Centris (Hemisiella) vulpecula; C. (Trachina) proxima; Megachile (Chrysosarus) pseudanthidioides; Xylocopa (Neoxylocopa) brasilianorum*
Calliandra selloi	R	n	*Augochlora (A.) amphitrite*
Calliandra tweediei	R	n	*Augochlora (A.) esox; A. (A.) tantilla; Augochloropsis cognata; Pseudaugochlora graminea; Trigona spinipes*
Canavalia rosea	L	n	*Eufriesea smaragdina*
Chamaecrista desvauxii	S	n	*Eufriesea smaragdina*
Crotalaria pallida	S	e	*Megachile (Grafella)* sp.2
Crotalaria spectabilis	S	e	*Eufriesea smaragdina*
Inga sp.	T	n	*Dialictus opacus; Exomalopsis (Phanomalopsis) trifasciata; Megachile (Leptorachis)* sp.4
Macroptilium atropurpureum	L	n	*Bombus (Fervidobombus) morio*
Mimosa bimucronata	T	n	*Bombus (Fervidobombus) morio; B. (F.) pauloensis; Ceratina (Crewella)* sp.2; *Neocorynura erinnys*
Mimosa pudica	S	n	*Bombus (Fervidobombus) morio; Parapsaenythia serripes; Trigona spinipes*
Senna macranthera	T	e	*Bombus (Fervidobombus) morio; Xylocopa (Neoxylocopa) brasilianorum*
Senna multijuga	T	n	*Plebeia droryana; Pseudaugochlora graminea; Trigona spinipes*
Senna cf. *tropica*	T	n	*Bombus (Fervidobombus) morio; Centris (Trachina) proxima; C. (T.) similis; Epicharis (Anepicharis) dejeanii; Eufriesea violacea; Partamona criptica; Pseudaugochlora graminea; Trigona spinipes; Xylocopa (Neoxylocopa) brasilianorum; X. (N.) frontalis; X. (Stenoxylocopa) artifex*
GESNERIACEAE			
Sinningia sp.	S	n	*Augochlorella ephyra*
LAMIACEAE			
Coleus barbatus	S	e	*Bombus (Fervidobombus) morio; Euglossa (E.) anodorhynchi*
Leonurus japonicus	S	e	*Anthidium manicatum; Ceratina (Crewella) richardsoniae; Hypanthidium divaricatum; Megachile (Austromegachile) susurrans; Paratetrapedia fervida; Tetrapedia diversipes*
Marsypianthes chamaedrys	S	?	*Arhysoceble picta; Augochlora (A.) amphitrite; A. (A.) esox; A. (A.) tantilla; A. (Oxystoglossella) morrae; A. (O.) semiramis; Augochlorella ephyra; Ceratina (Ceratinula)* sp.3*; C. (Crewella) richardsoniae; Coelioxys (Acrocoelioxys)* cf. *otomita; C. (Rhinocoelioxys) zapoteca; Exomalopsis (E.) analis; Hypanthidium divaricatum; Megachile (Dactylomegachile)* sp.2*; M. (Ptilosarus)* sp.1*; Psaenythia bergii; Pseudagapostemon (P.) pissisi*
Ocimum basilicum	S	e	*Augochlora* sp.11
Salvia splendens	S	e	*Augochlorella ephyra; Augochloropsis cognata; Plebeia droryana; Pseudaugochlora graminea; Trigona spinipes*
LILIACEAE			
Crinum erubescens	H	e	*Plebeia droryana*

Continuation of Table 2.

Habranthus sp.	H	?	*Ceratina (Ceratinula)* sp.1*; C. (Crewella) richardsoniae*
LORANTHACEAE			
Struthanthus sp.	E	n	*Augochloropsis cognata; A. chloera; A. sparsilis; Dialictus* sp.1*; D.* sp.14*; Neocorynura oiospermi; Temnosoma* sp.1*; Trigona spinipes*
LYTHRACEAE			
Lagerstroemia indica	R	e	*Augochlora* (*A.*) *tantilla; Dialictus* sp.2; *D.* sp.14; *Tetragonisca angustula*
MALVACEAE			
Hibiscus pernambucensis	R	n	*Eufriesea smaragdina*
Malvaviscus arboreus	R	e	*Plebeia droryana*
Pavonia sepium	S	n	*Augochlora* (*A.*) *amphitrite; A. (Oxystoglossella) morrae; Augochloropsis cognata; A. sparsilis; Coelioxys (Cyrtocoelioxys)* cf. *quaerens; Melissodes nigroaenea; Psaenythia bergii; Trigona spinipes*
Sida carpinifolia	S	n	*Acamptopoeum prinii; Augochlora* (*Oxystoglossella*) *semiramis*
Sida rhombifolia	S	n	*Trigona spinipes*
Sida sp.	S	n	*Augochlora (Oxystoglossella) semiramis*
MARANTACEAE			
Calathea sp.	H	n	*Eufriesea violacea*; *Euglossa (Glossura) annectans*
MELASTOMATACEAE			
Rhynchanthera cordata	S	n	*Augochlora (A.) foxiana; A. (Oxystoglossella) morrae; Augochloropsis* sp.2*; Centris (Melacentris) obsoleta; Exomalopsis (Phanomalopsis) trifasciata; Paratetrapedia fervida; Psaenythia bergii; Tetrapedia diversipes; Trigona spinipes; Xylocopa (Neoxylocopa) frontalis*
Tibouchina urvilleana	R	n	*Augochloropsis sympleres; Centris (C.) decolorata; Trigona spinipes*
MORACEAE			
Ficus pumila	L	e	*Dialictus* sp.3
MYRTACEAE			
Campomanesia littoralis	R	n	*Ceratina* (*Rhysoceratina*) sp.1; *Dialictus* sp.12
Eugenia uniflora	R	n	*Augochloropsis sparsilis; Partamona helleri*
Myrciaria glazioviana	R	e	*Megachile (Austromegachile) susurrans; Bombus (Fervidobombus) morio*
Psidium cattleyanum	R	n	*Arhysoceble picta; Augochlora (A.) amphitrite; Megachile (Pseudocentron) nudiventris; Melissodes nigroaenea*
Psidium guajava	T	e	*Augochlora (Oxystoglossella) semiramis; Plebeia droryana; Trigonopedia ferruginea; T. nigrifacies*
ONAGRACEAE			
Ludwigia octovalvis	S	n	*Augochloropsis cognata; A.* sp.1*; Austrostelis iheringi; Coelioxoides* cf. *waltheriae; Coelioxys (Acrocoelioxys) tolteca; Hypanthidium divaricatum; Megachile (Austromegachile) susurrans; Melissoptila bonaerensis; M. paraguayensis; M. setigera; Tetraglossula* sp.2*; Tetrapedia diversipes*
Ludwigia peruviana	S	n	*Augochlora (A.) amphitrite; A. (A.) dolichocephala; A. (A.) foxiana; A.* sp.5*; Melissoptila bonaerensis; M. setigera; Paratetrapedia volatilis; Tetrapedia diversipes; Xylocopa (Stenoxylocopa) artifex*

Continuation of Table 2.

Ludwigia sp.	S	n	*Coelioxys (Cyrtocoelioxys)* cf. *quaerens*
OXALIDACEAE			
Oxalis rhombeo-ovata	S	n	*Augochlora (A.) amphitrite; Augochlora* sp.13*; Hypanthidium divaricatum; Melissoptila bonaerensis*
PASSIFLORACEAE			
Passiflora edulis	L	?	*Xylocopa (Neoxylocopa) frontalis*
POACEAE			
Zea mays	H	e	*Augochloropsis* aff. *cleopatra*
POLYGONACEAE			
Polygonum punctatum	S	n	*Agapostemon chapadensis; Augochlora (A.) esox; Augochloropsis* aff. *cleopatra; A. cognata; A. sparsilis; A. sympleres; A.* sp.1; *A.* sp.11*; Ceratina (Crewella) richardsoniae; Dialictus opacus; Hypanthidium divaricatum; Melissoptila setigera; Pereirapis rhizophila; Plebeia remota; Psaenythia bergii; Temnosoma* sp.1*; Trigona spinipes*
ROSACEAE			
Rosa sp.	R	e	*Bombus (Fervidobombus) morio; Dialictus opacus; Eufriesea violacea; Euglossa (E.) anodorhynchi;*
RUBIACEAE			
Diodia apiculata	H	n	*Augochlora (A.) esox: Ceratina (Crewella) richardsoniae; Coelioxys* (*Cyrtocoelioxys*) cf. *quaerens; Hypanthidium divaricatum; Megachile (Austromegachile) susurrans; M. (Leptorachis)* sp.3*; Melipona marginata*
Diodia radula	H	n	*Cephalocolletes isabelae; Dialictus* sp.12*; Thectochlora hamata*
Pentas lanceolata	S	e	*Augochlora (A.) esox; A. (A.) tantilla; A. (Oxystoglossella) semiramis; Augochloropsis cognata; Ceratina (Crewella) richardsoniae; Euglossa (Glossura) annectans; E. (E.) anodorhynchi; Plebeia droryana; Pseudaugochlora graminea*
Psychotria sp.	R	n	*Trigonopedia ferruginea*
Richardia brasiliensis	H	n	*Augochlora (A.) amphitrite; Megachile (Melanosarus)* sp.1*; Saranthidium furcatum; Tetrapedia diversipes*
SOLANACEAE			
Brugmansia suaveolens	R	?	*Plebeia droryana*
Cyphomandra littoralis	R	n	*Dialictus opacus; Sphecodes* sp.1*; Thectochlora hamata;*
Petunia littoralis	H	n	*Callonychium* sp.*; Hexantheda enneomera; Pseudagapostemon (P.) hurdi*
Solanum americanum	S	n	*Agapostemon semimelleus; Augochlora (Oxystoglossella) morrae; A. (O.) semiramis; Augochlorella ephyra; Augochloropsis euterpe; Ceratina (Crewella) asuncionis; Dialictus* sp.2*; Exomalopsis* (*E.*) *auropilosa; Megachile (Moureapis)* sp.1*; Thectochlora hamata*
Solanum sp.	S	n	*Colletes rugicollis*
TILIACEAE			
Corchorus cf. *hirtus*	S	e	*Augochloropsis cognata; Trigona spinipes*
TROPAEOLACEAE			
Tropaeolum majus	H	e	*Augochlora (A.) esox; Plebeia droryana*

Continuation of Table 2.

VERBENACEAE			
Clerodendrum thomsoniae	L	e	*Pseudaugochlora graminea*
Clerodendrum sp.	?	e	*Augochlora (A.) esox; Dialictus* sp.14*; Pseudaugochlora graminea*
Holmskioldia sanguinea	R	e	*Euglossa (Glossura) annectans; Trigona spinipes*
Lantana camara	S	n	*Augochlora (A.) esox; Coelioxys (Acrocoelioxys) tolteca; Paratetrapedia volatilis*
Stachytarpheta cayennensis	S	?	*Augochlora (A.) esox; A. (Oxystoglossella) semiramis; Augochloropsis* aff. *cleopatra; Bombus (Fervidobombus) morio; C. (C.) decolarata; C. (C.) varia; C. (C.)* sp.1*; C. (Hemisiella) tarsata; Coelioxys (Cyrtocoelioxys)* cf. *quaerens; Epicharis (Anepicharis) dejeanii; E. (Epicharoides) picta; Exomalopsis* (*E.*) *auropilosa; Florilegus festivus; Leiopodus lacertinus; Megachile (Chrysosarus) pseudanthidioides; Monoeca* sp. nov.*; Paratetrapedia fervida; Protosiris gigas; P.* sp.1*; Pseudaugochlora graminea; Tetrapedia diversipes; Thectochlora hamata; Thygater (T.) analis; Trigonopedia ferruginea*
Verbena bonariensis	S	n	*Augochlora (Oxystoglossella) semiramis; A. (O.) morrae*
Vitex megapotamica	R	n	*Augochloropsis cognata; Bombus (Fervidobombus) morio; Caupolicana lugubris; Centris (Hemisiella) tarsata; C. (H.) vulpecula; Dialictus opacus; Epicharis (Anepicharis) dejeanii; Pseudagapostemon (P.) pissisi; Thectochlora hamata; Xylocopa (Neoxylocopa) brasilianorum*

Our study provided the first extensive survey on the bee fauna and the melittophilous plants used as food resources in the Atlantic rain forest in Santa Catarina. Although a great number of new records for Santa Catarina were reported by Steiner *et al.* (2006) and Krug & Alves-dos-Santos (2008), with 71 and at least 20 species, respectively, we here present 12 new records of bee species for Santa Catarina state. Among these, the stingless bee *Partamona criptica* is noteworthy since this species was never before captured in other Atlantic forest areas than the southeastern states of São Paulo, Minas Gerais, Rio de Janeiro and Espírito Santo (Pedro & Camargo 2003). However, since our sampling effort was focused on non-forest species and because some species recorded on the island were not captured by us (Lenzi *et al.* 2003, Castellani & Lopes 2002) the total number of bee species is expected to continue to rise. Also, only a small portion of the flora of Santa Catarina Island was sampled for bees until today so that many more melittophilous plant species will be identified in future studies.

THE IMPORTANCE OF NON-ARBOREAL NATIVE PLANTS FOR THE APIFAUNA

Most (64%) of the melittophilous plant species are native for Santa Catarina Island (Figure 1) and were mainly subshrubs (36%) and shrubs (21%) (Figure 2). Ninety one percent of the bee species were recorded on native plant species, and part of them (18%) also visited exotic plants (Figure 3). Only 4% of the bee species were collected exclusively on exotic plants and even though 38 bee species (22%) visited exotic plants, all the species were of low importance for bees, with only few associated species. Among the species of unknown origin only on *Wedelia trilobata* (Asteraceae) a high number of bee species (19) was collected.

The present study reveals the importance of non-arboreal native plants for the local apifauna. Although bees were collected on nine species of trees only, due to the difficulties of sampling at tall trees and in the forest, a high bee richness was obtained on non-arboreal species at Santa Catarina Island. Among the native

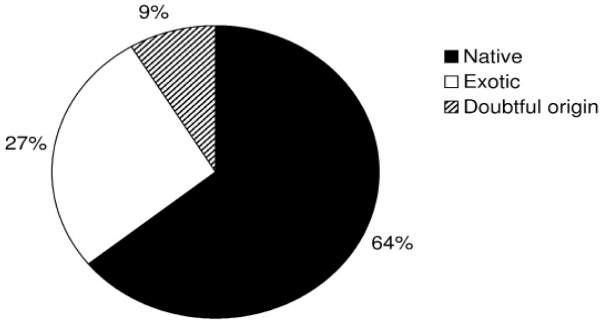

Figure 1. Proportion (%) of species with native, exotic and doubtful origin in our sample of melittophilous plants studied on Santa Catarina Island, Southern Brazil.

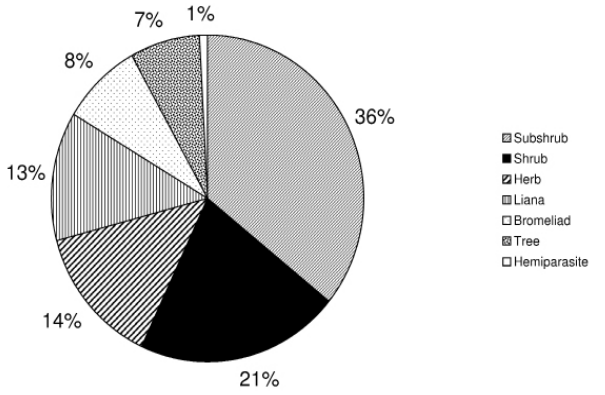

Figure 2. Proportion of species (%) according to their habit in our sample of melittophilous plants studied on Santa Catarina Island, Southern Brazil.

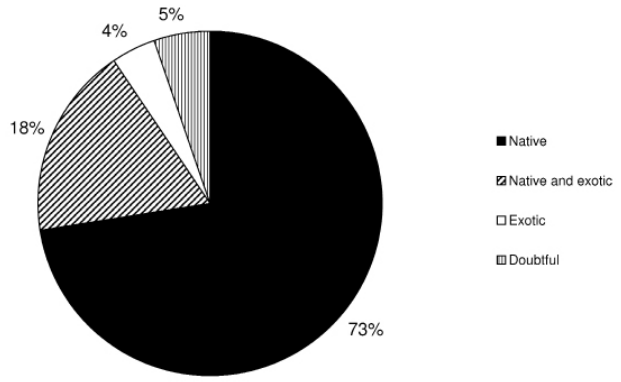

Figure 3. Proportion of the number of bee species (%) according to the origin of the plants visited.

plants many subshrubby and shrubby Asteraceae (e.g. *Vernonia*, *Baccharis*, *Erechtites*) offer food sources for many bee species. This was also observed in other areas in southern Brazil (Schwartz-Filho & Laroca 1999, Alves-dos-Santos 2007). Besides confirming the importance of species of Fabaceae, Lamiaceae, Solanaceae and Verbenaceae to the apifauna on Santa Catarina Island, a feature also observed in various other habitats in southern Brazil (Schwartz-Filho & Laroca 1999, Alves-dos-Santos 2007), we also found a high number of bee species associated with Bromeliaceae, plants on which bees were rarely recorded in other bee inventories. Furthermore, flowers of Onagraceae (*Ludwigia* spp.) also attracted a large spectrum of bees in our sites as well as in other coastal regions in southern Brazil (Alves-dos-Santos 2007) and different areas in São Paulo state (Gimenes 1997). Similarly, high bee species richness was also observed on Convolvulaceae (*Ipomoea* spp.) at Santa Catarina Island.

Besides the importance of preserved forest areas for the maintenance of a rich bee community, the native non-arboreal vegetation plays an important role for bees too. This implies that already deforestated areas are more rewarding to bees if they present secondary vegetation consisting of native plants (natural succession of plant communities) rather than exotic ornamental species.

HIGHLY ATTRACTIVE MELITTOPHILOUS PLANTS

In the Asteraceae, species of *Baccharis* and *Vernonia* are among the most attractive to the apifauna in Southern Brazil (Alves-dos-Santos 2007). This is also true for Santa Catarina Island, where *Vernonia tweedieana*, *Vernonia* spp., *Baccharis spicata, Baccharis* spp. and *Bidens pilosa* were important food plants for bees indicated by the high bee richness associated to them.

In our sample, *Stachytarpheta cayennensis* (Verbenaceae) was the second most visited species with 25 bee species collected. The same seems to be true in coastal areas of Paraná (Ilha das Cobras, Ilha do Mel and Alexandra) where this species was also visited by a rich bee fauna (Schwartz-Filho & Laroca 1999). A similar bee richness (26 spp.) was also obtained on *S. maximiliani*, besides a high number of species of other insects (total of 59 species of flower visitors) in an Atlantic forest site at Morretes, Paraná (Barbola *et al.* 2006). A high number of flower visitors, among them 13 species of bees, was also recorded on *S. glabra* in Minas Gerais (Jacobi & Antonini 2008). Thus species of *Stachytarpheta* seem to be important melittophilous plants of open areas offering mainly nectar to their visitors (Schwartz-Filho & Laroca 1999, Jacobi & Antonini 2008).

Schinus terebinthifolius is another species with numerous interactions with the apifauna. In coastal areas in Paraná, Schwartz-Filho & Laroca (1999) recorded a high richness (21 spp. at Ilha das Cobras) of bees on its flowers which seem to be an important food resource for species of Colletidae, since 46% and 77.5% of the individuals of Colletidae at Ilha das Cobras and Ilha do Mel, respectively, were captured at this tree. At Santa Catarina Island, besides a high number of bee species (19) collected by us on *S. terebinthifolius*, Lenzi *et al.* (2003) also listed 20

species of bees visiting this species, but in total only three of them were colletid species.

Furthermore, at Santa Catarina Island the liana species of *Ipomoea* and the subshrubs *Marsypianthes chamaedrys* and *Polygonum punctatum* were also visited by a large spectrum of bees.

Although no data are presented about the frequency of individuals captured at flowers, the large spectrum of bees captured enables us to suggest that the plant species listed above may be used as target plants in Atlantic forests areas for rapid assessments of the subtropical apifauna, as proposed by Alves-dos-Santos (2007). Especially useful for such assessments are those species with a long flowering period such as *Baccharis spicata, Bidens pilosa*, *Ipomoea* spp. and *Stachytarpheta cayennensis,* and species whose flowering period coincides with the foraging activity of the highest number of bee species between September and March in subtropical Brazil. Examples for such plants are *Polygonum punctatum* (flowering period from October to Abril), *Schinus terebinthifolius* (October to May) and *Vernonia tweedieana* (January to July).

OLIGOLECTIC AND POLYLECTIC BEES

Even though we did not identify the type of resource gathered by the bees it is possible to draw some conclusions about the foraging behavior of the bees. Presumably an oligolectic species is *Hexantheda enneomera* which was collected mainly on *Petunia littoralis* at Santa Catarina Island. Other oligolectic species in the genus support this hypothesis, as observed by Alves-dos-Santos (1999) in Rio Grande do Sul for *Hexantheda missionica* (associated with *Ludwigia* spp.) and *Hexantheda* sp. (associated with *Petunia* spp.). Our findings further support the conclusions about oligolecty in *Ancyloscelis apiformis* (associated with Convolvulaceae, namely *Ipomoea* and *Merremia* – Schlindwein 1998, Alves-dos-Santos 1999), *Callonychium* (associated with *Petunia* spp. – Wittmann *et al.* 1990, Alves-dos-Santos 1999, Castellani & Lopes 2002), *Cephalocolletes isabelae* (associated with *Opuntia monacantha* – Alves-dos-Santos 1999), *Melissoptila paraguayensis* (associated with *Ludwigia* spp. – Alves-dos-Santos 1999), *Melitoma segmentaria* (associated with *Ipomoea* spp. – Schlindwein 1998, Alves-dos-Santos 2000), *Ptilotrix relata* (associated with *Ipomoea* spp. and *Ludwigia* spp. – Schlindwein 1998, Alves-dos-Santos 1999) and *Tetraglossula* sp.2 (associated with *Ludwigia* spp. – Gimenes 1997, Schlindwein 1998, Alves-dos-Santos 1999).

In our sample, most of the pollen specialist bee species are associated with species of *Ipomoea, Ludwigia* and *Petunia.* Therefore, these plant species play an important role for the oligolectic bees at Santa Catarina Island and that seems to be similar for other Atlantic forest areas, since almost half of the 55 species listed as specialists by Alves-dos-Santos (1999) for the state of Rio Grande do Sul are also associated with plants in these genera.

Among the most generalist bees are the corbiculate Apidae, *Ceratina* (*Crewella*) *richardsoniae*, *Dialictus opacus, Xylocopa* spp., and some Augochlorini (*Augochlora* spp., *Augochloropsis* spp., *Pseudaugochlora graminea, Thectochlora hamata)* as also observed by Schlindwein (1998) and Alves-dos-Santos (1999) for southern Brazil. Most of these species are multivoltine, except for the orchid bee *Eufriesea smaragdina* which is univoltine (Kamke *et al.* 2008).

NEW PLANT RECORDS FOR RARE BEES

Many bee surveys list few species of Euglossini, and if so, the bees were often attracted by scent baiting. In contrast we collected four species of orchid bees on 22 plant species in 11 families. Among those host plants we must emphasize species of Bromeliaceae which are often exploited by the two species of *Euglossa* occurring on the island. Although presenting an ornithophilous floral-syndrome the bromeliads appear to be highly attractive for those particularly long-tongued bees not only as nectar but also as pollen sources (Cortopassi-Laurino *et al.* 2009).

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