Trees, shrubs and herbs of the coastal Myrtaceae swamp forest (Región de La Araucanía, Chile): a dataset

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Abstract

Background

Species lists are fundamental for knowledge of species diversity in regions subject to intense anthropogenic pressure, especially in poorly-studied ecosystems. The dataset comes from an inventory conducted in 30 fragments of Myrtaceae swamp forest, located in an agroforestry matrix landscape of the coastal La Araucanía Region in Chile. The data collection was carried out using line transect sampling, which was traced through the core of each fragment orientated towards its longest axis. The dataset provides a record of 55 species (24 trees, 1 vine [as a host], 16 herbs and 15 shrubs) including accidental epiphytes (n = 7), hemiparasites (n = 4), host (n = 10) and additionally woody debris (n = 36). The most frequent trees in the landscape were Myrceugenia exsucca (n = 36 records) and Blepharocalyx cruckshanksii (n = 33 records), species that were also the most common hosts. Drimys winteri was a companion species, other trees and shrubs generally being rarely observed, as was the case of the introduced species (Prunus avium, Rubus constrictus and Ulex europaeus). Branches were the most common microhabitat for...
hemiparasites. Within this group, *Lepidoceras chilense* was the most frequent species. For accidental epiphytes, *Drimys winteri*, which commonly grows on the ground (soil), were the most common species found in the main trunk crotch. Some unusual observations were the climber *Cissus striata* as host of *Tristerix corymbosus* (hemiparasite) and *Tristerix corymbosus* as host of *Lepidoceras chilense* (hemiparasite).

**New information**

This study represents a landscape-scale sample of the swamp forest, which is distributed in a dispersed pattern over a large stretch of Chile. The data were collected from 30 forest patches (from 0.05 to 936 ha), located on the coast of the Araucania. The database includes the presence of 55 species of vascular plants in 356 records. The main novelty of this contribution is the systematic classification of species under six traits, never before reported in the same database: (i) condition (coarse woody debris, fallen log, live, snag), (ii) habit (herb, shrub, tree), (iii) growth microhabitat (e.g. tree trunk, branch, main trunk crotch), (iv) growth form (accidental epiphyte, hemiparasite, terricolous, vegetative), (v) host species (as appropriate) and (vi) relative location of the species in the sampled patch and surrounding areas (core, border, matrix). Species not previously observed in these forests were: *Gavilea* spp., *Hieracium* spp., *Lophosoria quadripinnata*, *Berberis actinacantha*, *Gaultheria phillyreifolia*, *Ovidia pillo-pillo*, *Amomyrtus meli* and *Caldcluvia paniculata*. In addition, two introduced species are novelties for the catalogue of vascular plants of Chile (*Cupressus macrocarpa* and *Prunus avium*). Several of these ecosystem traits are indeed new reports for these types of forests (e.g. accidental epiphytes, fallen logs, species-host relationship); at the same time, more frequent data (i.e. species composition, habit) are found in different contributions, making the comprehensive process of analysis difficult. Accordingly, the database is made available in this manuscript.

**Keywords**

biodiversity, cultural landscape, metacommunity, species richness, species inventory, wetlands

**Introduction**

Species lists are fundamental for knowledge of species diversity in regions subject to strong anthropogenic pressure (Funk 2006, Hortal et al. 2007, Hermoso et al. 2013, Pincheira-Ulbrich et al. 2016, Cornwell et al. 2019).

South American swamp forests dominated by species of the family Myrtaceae Juss. are distributed in Chile in a dispersed pattern from 30°S (Coquimbo) to 41°28’S (Puerto Montt), in a transition from semi-arid to temperate rain climate, representing one of the widest geographic and climatic distribution ecosystems in Chile (Maldonado and Villagrán 2001, San Martín 2005, Armesto et al. 2007, Ramírez et al. 2014).
To the north, their formations are located along the coast, while towards the centre and south of Chile, the patches are found both on the coast and in central plains and less frequently in the Andean foothills. Their location and extension are determined by the presence of surface phreatic layers, so the type of soil does not seem to be a determining factor in their growth. In this sense, these forests are described as azonal hydrophilic formations, meaning that their presence is not determined by the regional climate, but rather by an excess of edaphic humidity (see Amigo and Ramírez 1998, Maldonado and Villagrán 2001, Peña-Cortés et al. 2011, Ramírez et al. 2014).

Swamp forests are a particular type of wetland, classified by the Ramsar Convention as “forested freshwater wetlands”. At the international level, wetland areas have been recognised for their high biological and environmental value and as providers of ecosystem services (Zedler and Kercher 2005, Barbier 2013, Marton et al. 2015). In Chile, there is a Wetland Protection Policy expressed in the National Wetland Strategy and the National Biodiversity Strategy. However, swamp forests are one of the most altered ecosystems in this country, as they have frequently been threatened by human use pressure for agricultural fields, grazing and firewood extraction (San Martín et al. 1988, Squeo F et al. 2001, Ramírez et al. 2014).

These ecosystems are home to a rich diversity of vascular plants that varies from eight species in a highly-degraded site in central Chile (Ramírez et al. 2014) to 61 species in better-conserved sites in the central-southern zone of this country (Hauenstein et al. 2014). At a regional scale, the richness varies between 158 and 182 species, amongst landscapes in the northern area (San Martín et al. 1988) and south of their distribution (Larrain 2011), respectively. Along the coast of Araucanía, these forests are mainly composed of *Myrceugenia exsucca* O.Berg and *Blepharocalyx cruckshanksii* (Hook. & Arn.) Nied. They are represented by an area of 7,675 ha, which is approximately 4.6% of this territory and where 427 forest fragments are distributed within a predominantly agricultural and forestry matrix. Forest is found exclusively in flat areas (alluvial plains), associated with both watercourses and different levels of soil waterlogging (Peña-Cortés et al. 2011).

In this contribution, we present a database of vascular plants in 30 swamp forest fragments distributed along the coast of the Araucanía Region (Table 1, Suppl. material 1). The data describes (i) species composition (Fig. 1), (ii) condition (coarse woody debris, fallen log, live, snag), (iii) habit (herb, shrub, tree, Fig. 1), (iv) growth microhabitat (e.g. tree trunk, branch, main trunk crotch, fallen log, soil, Fig. 2), (v) growth form [accidental epiphyte (Fig. 3), hemiparasite (Fig. 4), terricolous (Fig. 5), vegetative], (vi) host species (as appropriate, Fig. 2) and (vii) relative location of the species in the sampled patch and surrounding areas (core, border, matrix). In addition, two introduced species were observed (*Cupressus macrocarpa* and *Prunus avium*) that are new to the catalogue of vascular plants of Chile (Rodríguez et al. 2018). Several of the biological backgrounds presented here have not been reported in literature (e.g. Hauenstein et al. 2002, Hauenstein et al. 2017, Urrutia-Estrada et al. 2018), so the database is left available in this manuscript. This contribution complements the work of Pincheira-Ulbrich et al. (2016) who reported the complete
catalogue of climbing plants and vascular epiphytes in coastal Myrtaceae swamp forest in La Araucanía Region.

**General description**

**Purpose:** This contribution provides background information for biodiversity, meta-community or macro-ecological studies, as it also includes the geographical location of forest fragments. Some biodiversity traits have not been reported in literature, such as the recording of tree remains and accidental epiphytes. These data are expected to contribute to the local valuation and conservation of these highly-degraded ecosystems.

| No. | Specie                                      | Phylum       | Family       | Habit | Geographic origin |
|-----|---------------------------------------------|--------------|--------------|-------|-------------------|
| 1   | *Acacia melanoxylon* R. Br.                | Magnoliophyta| Fabaceae     | Tree  | Introduced        |
| 2   | *Acaena* spp.                              | Magnoliophyta| Rosaceae     | Herb  | Native            |
| 3   | *Aextoxicon punctatum* Ruiz & Pav.         | Magnoliophyta| Aextoxicaceae| Tree  | Native            |
| 4   | *Amomyrtus luma* (Molina) D. Legrand & Kause| Magnoliophyta| Myrtaceae    | Tree  | Native            |
| 5   | *Amomyrtus meli* (Phil.) D. Legrand & Kausel| Magnoliophyta| Myrtaceae    | Tree  | endemic           |
| 6   | *Antidaphne punctulata* (Clos) Kuijt       | Magnoliophyta| Santalaceae  | Shrub | Endemic           |
| 7   | *Aristotelia chilensis* (Molina) Stuntz    | Magnoliophyta| Elaeocarpaceae| Tree  | Endemic           |
| 8   | *Berberis actinacantha* Mart.              | Magnoliophyta| Berberidaceae| Shrub | Endemic           |
| 9   | *Blechnum chilense* (Kauff.) Mett.         | Pterophyta   | Blechnaceae  | Herb  | Native            |
| 10  | *Blechnum hastatum* Kauff.                 | Pterophyta   | Blechnaceae  | Herb  | Native            |
| 11  | *Blepharocalyx cruckshanksii* (Hook. & Arn.) Nied. | Magnoliophyta| Myrtaceae    | Tree  | Endemic           |
| 12  | *Caldcluvia paniculata* (Cav.) D. Don      | Magnoliophyta| Cunoniaceae  | Tree  | Native            |
| 13  | *Chusquea quila* Kunth                     | Liliopsida   | Poaceae      | Herb  | Endemic           |
| 14  | *Cissus striata* Ruiz & Pav.               | Magnoliophyta| Vitaceae     | Vine  | Native            |
| 15  | *Cupressus macrocarpa* Hartw               | Pinophyta    | Cupressaceae | Tree  | Introduced        |
| 16  | *Dioscorea auriculata* Poepp.              | Liliopsida   | Dioscoreaceae| Herb  | Endemic           |
| 17  | *Drimys winteri* J.R. Forst. & G. Forst.  | Magnoliophyta| Winteraceae  | Tree  | Endemic           |
| 18  | *Eucryphia cordifolia* Cav.                | Magnoliophyta| Eucryphiaceae| Tree  | Native            |

Table 1. Trees, shrubs and herbs of the Myrtaceae swamp forest. Classification of species according to the criteria of Phylum, Family, Habitat and Geographical origin is based on Rodríguez et al. (2018).
| n  | Specie                                              | Phylum           | Family       | Habit | Geographic origin |
|----|-----------------------------------------------------|------------------|--------------|-------|-------------------|
| 19 | *Fuchsia magellanica* Lam.                         | Magnoliophyta    | Onagraceae   | Shrub | Native            |
| 20 | *Galium hypocarpium* (L.) Endl. ex Griseb.         | Magnoliophyta    | Rubiaceae    | Herb  | Native            |
| 21 | *Gaultheria phillyreifolia* (Pers.) Sleumer         | Magnoliophyta    | Ericaceae    | Shrub | Native            |
| 22 | *Gavilea* spp.                                     | Liliopsida       | Orchidaceae  | Herb  | Native            |
| 23 | *Greigia sphaelata* (Ruiz & Pav.) Regel            | Liliopsida       | Bromeliaceae | Herb  | Native            |
| 24 | *Hieracium* spp.                                   | Magnoliophyta    | Asteraceae   | Herb  | UD                |
| 25 | *Hydrocotyle poeppigii* DC.                        | Magnoliophyta    | Apiaceae     | Herb  | Endemic           |
| 26 | *Juncus* spp.                                      | Liliopsida       | Juncaceae    | Herb  | Native            |
| 27 | *Lepidoceras chilense* (Molina) Kuijt              | Magnoliophyta    | Santalaceae  | Shrub | Endemic           |
| 28 | *Lomatia ferruginea* (Cav.) R. Br.                 | Magnoliophyta    | Proteaceae   | Tree  | Native            |
| 29 | *Lophosoria quadrivittata* (J.F. Gmel.) C. Chr.    | Pterophyta       | Dicksoniaceae| Herb  | Native            |
| 30 | *Luma apiculata* (DC.) Burret                      | Magnoliophyta    | Myrtaceae    | Tree  | Native            |
| 31 | *Luma chequen* (Molina) A. Gray                    | Magnoliophyta    | Myrtaceae    | Tree  | Endemic           |
| 32 | *Maytenus boaria* Molina                           | Magnoliophyta    | Celastraceae | Tree  | Native            |
| 33 | *Myrcigenia exsua* (DC.) O. Berg                   | Magnoliophyta    | Myrtaceae    | Tree  | Native            |
| 34 | *Myrcigenia parvifolia* (DC.) Kausel               | Magnoliophyta    | Myrtaceae    | Shrub | Endemic           |
| 35 | *Myrcigenia planipes* (Hook. & Arn.) O. Berg       | Magnoliophyta    | Myrtaceae    | Tree  | Native            |
| 36 | *Myriophyllum aquaticum* (Vell.) Verdc.            | Magnoliophyta    | Haloragaceae | Herb  | Native            |
| 37 | *Nertera granadensis* (Mutis ex L.f.) Druce        | Magnoliophyta    | Rubiaceae    | Herb  | Native            |
| 38 | *Notanthera heterophylla* (Ruiz & Pav.) G. Don      | Magnoliophyta    | Loranthaceae | Shrub | Endemic           |
| 39 | *Nothofagus dombeyi* (Mirb.) Oerst.                 | Magnoliophyta    | Nothofagaceae| Tree  | Native            |
| 40 | *Nothofagus obliqua* (Mirb.) Oerst.                 | Magnoliophyta    | Nothofagaceae| Tree  | Native            |
| 41 | *Ovidia pillo-pillo* (Gay) Meisn.                   | Magnoliophyta    | Thymelaeaceae| Shrub | Endemic           |
| 42 | *Persea lingue* (Ruiz & Pav.) Nees                  | Magnoliophyta    | Lauraceae    | Tree  | Native            |
| 43 | *Prunus avium* (L.) L.                             | Magnoliophyta    | Rosaceae     | Tree  | Introduced        |
| 44 | *Rhamnus diffusus* Clos                            | Magnoliophyta    | Rhamnaceae   | Shrub | Endemic           |
| 45 | *Rhaphithamnus spinosus* (Juss.) Moldenke           | Magnoliophyta    | Verbenaceae  | Shrub | Native            |
| 46 | *Ribes trilobum* Meyen                             | Magnoliophyta    | Grossulariaceae| Shrub | Endemic           |
| 47 | *Rubus constrictus* P.J. Müll. & Lefèvre           | Magnoliophyta    | Rosaceae     | Shrub | Introduced        |
| 48 | *Salix babylonica* L.                              | Magnoliophyta    | Salicaceae   | Tree  | Introduced        |
| n  | Specie                                      | Phylum       | Family     | Habit | Geographic origin |
|----|--------------------------------------------|--------------|------------|-------|-------------------|
| 49 | *Salix caprea* L.                          | Magnoliophyta| Salicaceae  | Tree  | Introduced        |
| 50 | *Sophora cassioides* (Phil.) Sparre         | Magnoliophyta| Fabaceae   | Tree  | Endemic           |
| 51 | Sp1                                        | Liliopsida   | Cyperaceae  | Herb  | Native            |
| 52 | *Tepualia stipularis* (Hook. & Am.) Griseb | Magnoliophyta| Myrtaceae   | Tree  | Native            |
| 53 | *Tristerix corymbosus* (L.) Kuijt           | Magnoliophyta| Loranthaceae| Shrub | Native            |
| 54 | *Ugni molinae* Turcz.                      | Magnoliophyta| Myrtaceae   | Shrub | Native            |
| 55 | *Ulex europaeus* L.                        | Magnoliophyta| Fabaceae    | Shrub | Introduced        |

**Project description**

**Study area description:** The study area is located on the coast of the Araucanía Region of Chile (38°30′–39°30′S, 72°45′–73°30′W). It covers an area of 1656 km², bounded by the Imperial River in the south and the Queule in the north and lying between the Coastal Range to the east and the Pacific Ocean to the west. The climate is oceanic with a Mediterranean influence, with average annual precipitation of 1200–1600 mm (Luebert and Pliscoff 2006).

The territory is distributed amongst numerous indigenous Mapuche communities and private farming/forestry properties (Pincheira-Ulbrich 2018). The land is divided into small plots, with high poverty and rural dwelling, mostly unchanged since the middle of the 20th century (Gissi 2004, Peña-Cortés et al. 2020). As a result, the historical and current pressure on the forest has meant that most of its area is in a degraded state, set in a matrix of anthropogenic landscape (Peña-Cortés et al. 2011, Hauenstein et al. 2014, Peña-Cortés et al. 2020b). Therefore, the forest is a secondary ecosystem (diameter at breast height of trees $x = 19 \pm 11$ cm), consisting mainly of native species of the Myrtaceae family (10 species).

**Design description:** The forest patches were grouped into five size classes: < 0.5 ha, 0.5–2 ha, 2–10 ha, 10–50 ha and > 50 ha. The seven largest fragments (> 50 ha) were chosen subjectively and six fragments were selected at random from each of the other classes, except the 0.5–2 ha class, which contained only five fragments. This produced a total of 30 sampling sites distributed over the whole study area (see Pincheira-Ulbrich et al. 2016). In the field, sampling design was non-random in order to include the largest possible variety of micro-habitats and rare species (Croft and Chow-Fraser 2009, Dieckman et al. 2007). Data were collected from 2011 to 2013, with 32 days spent in the field.
Figure 1. Species richness classified by number of families (top) and habit (bottom). In both figures, the species are arranged according to Phylum, while in the upper figure, the geographical origin is also included.

Figure 2. Species richness sorted by host (left) and microhabitat (right).
Sampling methods

Sampling description: Sampling followed a transect sampling observations protocol, orientated from the edge towards the centre of the fragment (Brower et al. 1990). Field notes and photographs, taken throughout the transect, were reviewed in the lab. Seven types of data were recorded: (i) Taxonomic identity, following the criteria established in the publications of Marticorena and Rodríguez (Marticorena and Rodríguez 2001, Marticorena and Rodríguez 2003, Marticorena and Rodríguez 2005, Marticorena and Rodríguez 2011), (ii) condition (coarse woody debris, fallen log, live, snag), according to Enrong et al. (2006), (iii) habit (herb, shrub, tree) according to Harris and Harris (2001), (iv) growth microhabitat (e.g. tree trunk, branch, main trunk crotch, fallen log soil) according to field observations, (v) growth form (accidental epiphyte, hemiparasite, terricolous, vegetative) according to Benzing (2008), (vi) host species (as appropriate) and (vii) relative location of the species in the sampled patch and surrounding areas (core, border, matrix). The taxonomic nomenclature was based on Rodríguez et al. (2018) and The International Plant Names Index (2019).

Geographic coverage

Figure 3. doi

Accidental epiphytes: A. *Drimys winteri* growing on the base of a *Myrceugenia exsucca* trunk; B. *Drimys winteri* growing on *Cupressus macrocarpa* main trunk crotch; C. *Nertera granadensis* growing on *Cupressus macrocarpa* main trunk crotch; D. *Aristotelia chilensis* growing on *Blepharocalyx cruckshanksii* main trunk crotch; E. *Hieracium* spp. growing on the base of a *Myrceugenia exsucca* trunk; F. *Chusquea quila* growing on the base of a *Myrceugenia exsucca* trunk; G. *Ribes trilobum* growing on *Blepharocalyx cruckshanksii* main trunk crotch; H. *Lomatia ferruginea* growing on *Amomyrtus luma* main trunk crotch.

Description: The study area is located on the coast of the Araucanía Region of Chile (38°30′–39°30′S, 72°45′–73°30′W). It covers an area of 1656 km², bounded by the Imperial River in the south and the Queule in the north and lying between the Coastal Range to the east and the Pacific Ocean to the west.
Hemiparasites: A. Antidaphne punctulata growing on Myrceugenia exsucca; B. Antidaphne punctulata growing on Luma apiculata; C. Lepidoceras chilense, insertion point on an Blepharocalyx cruckshanksii branch; D. Lepidoceras chilense, leaf distribution; E. Notanthera heterophylla growing on Myrceugenia exsucca; F. Notanthera heterophylla, details leaves and fruits; G. Tristerix corymbosus growing on climber Cissus striata; H. Tristerix corymbosus, details leaves and flower.

Common tree/shrub species. Leaves and bark: A. Amomyrtus luma; B. Amomyrtus meli; C. Blepharocalyx cruckshanksii; D. Luma chequen; E. Myrceugenia exsucca; F. Myrceugenia parvifolia; G. Myrceugenia planipes; H. Tepualia stipularis. Leaves and fruits (berries): I. Rhamnus diffusus; J. Ugni molinae.

Coordinates: Imperial River and Tolten Rive Latitude; Pacific Ocean and Coastal mountain range. Longitude.
Traits coverage

Trees, shrubs, accidental epiphytes, host.

Temporal coverage

Notes: 2011-2013

Usage licence

Usage licence: Creative Commons Public Domain Waiver (CC-Zero)

Data resources

Data package title: Trees, shrubs and herbs of the coastal Myrtaceae swamp forest in La Araucanía: a dataset

Number of data sets: 1

Data set name: Trees, shrubs and herbs of the coastal Myrtaceae swamp forest in La Araucanía: a dataset

Data format: csv

Data format version: csv

Description: The dataset provides a record of 55 species (24 trees, 1 vine, 16 herbs, and 15 shrubs) including accidental epiphytes (n = 6), hemiparasites (n = 4), host (n = 11) and additionally woody debris (n = 36) in 356 records. The data describes (i) species composition, (ii) condition (coarse woody debris, fallen log, live, snag), (iii) habit (herb, shrub, tree), (iv) growth microhabitat (e.g. tree trunk, branch, main trunk crotch, fallen log, soil), (v) growth form (accidental epiphyte, hemiparasite, terricolous, vegetative), (vi) host species (as appropriate) and (vii) relative location of the species in the sampled patch and surrounding areas (core, border, matrix). Several of the biological backgrounds presented here have not been reported in literature, so the database is left available in this manuscript.

| Column label     | Column description                                                                 |
|------------------|-------------------------------------------------------------------------------------|
| Patch size (ha)  | Forest fragment size in hectares.                                                   |
| Latitude         | Geographic coordinate that specifies the north–south position of a point on the    |
|                  | Earth’s surface                                                                     |
| Longitude        | Geographic coordinate that specifies the east–west position of a point on the      |
|                  | Earth’s surface                                                                     |
| ID | Record number |
|----|---------------|
| Species | Scientific name of species |
| Condition | Living trees and tree debris. Coarse woody debris, Fallen log, Live, Snag |
| Habit | Growth habit according to literature. Herb, Shrub, Tree, NA (Not applicable) |
| Microhabitat | Site where the individual was observed growing. Base of trunk, Branch, Fallen log, Main trunk crotch, Soil, Stem, Trunk |
| Growth form | Growth form observed in the field. Accidental ephyphyte, Hemiparasite, Terricolous, Vegetative, NA (Not applicable) |
| Host | Scientific name of species. |
| Location1 | Relative location 1 of the record in the field. Core, Core-Gap, Edge, Gap-Edge, Matrix. |
| CoordinateUncertaintyInMetres1 | Horizontal distance (in metres) from the given decimal Latitude and decimal Longitude describing the smallest circle containing the whole of the Location. |
| Location2 | Relative location 2 of the record in the field. Core, Core-Gap, Edge, Gap-Edge, Matrix, NA (Not applicable) |
| CoordinateUncertaintyInMetres2 | Horizontal distance (in metres) from the given decimal Latitude and decimal Longitude describing the smallest circle containing the whole of the Location. |
| Location3 | Relative location 3 of the record in the field. Core, Core-Gap, Edge, Gap-Edge, Matrix, NA (Not applicable) |
| CoordinateUncertaintyInMetres3 | Horizontal distance (in metres) from the given decimal Latitude and decimal Longitude describing the smallest circle containing the whole of the Location. |
| Date | Registration date. |
| Sampling protocol | Field sampling protocol. |
| Observer name | Name of person who collected data in the field. |
| Notes | Other observations in the field, UD (Undefined) |

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Author contributions

Jimmy Pincheira-Ulbrich: Conceptualisation, Application of method, Data analysis. Elías Andrade Mansilla: Data discussion, Investigation. Fernando Peña-Cortés: Visualisation, Reviewing and Editing. Cristián Vergara: Visualisation, Reviewing and Editing.

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Supplementary material

Suppl. material 1: Trees, shrubs and herbs of the coastal Myrtaceae swamp forest in La Araucanía: a dataset

Authors: Jimmy Pincheira-Ulbrich, Elías Andrade Mansilla, Fernando Peña-Cortés, Cristian Vergara Fernández

Data type: Occurrences

Brief description: The dataset provides a record of 55 species (24 trees, 1 vine, 16 herbs and 15 shrubs) including accidental epiphytes (n = 6), hemiparasites (n = 4), host (n = 11) and additionally woody debris (n = 36) in 357 records. The data describe (i) species composition, (ii) condition (coarse woody debris, fallen log, live, snag), (iii) habit (herb, shrub, tree), (iv) growth microhabitat (e.g. tree trunk, branch, main trunk crotch), (v) growth form (accidental epiphyte, hemiparasite, terricolous, vegetative), (vi) host species (as appropriate) and (vii) relative location of the species in the sampled patch and surrounding areas (core, border, matrix). Several of the biological backgrounds presented here have not been reported in literature, so the database is left available in this manuscript.

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