Title: The Marsupial Database: A comprehensive dataset on the ecology and life history of American and Australasian marsupials

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Metadata S1. Ferreira, M.S., et al. 2025. The Marsupial Database: A comprehensive dataset on the ecology and life history of American and Australasian marsupials. Ecology.

Introduction

Marsupials represent the only extant group of Metatheria, constituting one of the three major lineages of living mammals, alongside monotremes and eutherians (placental mammals). Currently, there are 396 extant species of marsupials, distributed in the Americas and Australasia (Abreu et al. 2024; Astúa et al. 2023; AMTC 2024; Baker et al. 2023). Extant marsupials encompass many commonly known and iconic species, including opossums, kangaroos, koala, possums, wombats, Tasmanian devils, and bandicoots. This diverse group of mammals includes species with a broad spectrum of adaptive strategies. They thrive in the driest deserts and in the wettest tropical forests, living in terrestrial, arboreal, subterranean, and aquatic environments; some are highly social while others are solitary; many are omnivorous, while others are carnivorous or herbivorous (Cáceres & Dickman 2023). However, marsupials differ from other mammals by their mode of reproduction and reproductive anatomy (Tyndale-Biscoe 2005). Young are born at an early stage of development, after a relatively short gestation period (Hayssen et al. 1985). For marsupial species, most growth of young and the majority of energy allocated to reproduction occurs during lactation, which is 40% longer than in eutherians of comparable body mass (Hayssen et al. 1985; Sunquist & Eisenberg 1993). These fundamental differences in the timing and mode of maternal energy allocation to reproduction have major consequences for marsupial ecology and conservation.

Marsupials face numerous challenges posed by anthropogenic changes to their environment (Lindenmayer & Dickman 2023; Doherty et al. 2023; Vieira et al. 2023). Despite the wide diversity of adaptive strategies of marsupials, rapid environmental changes make it uncertain whether species will be able to cope with such changes and avoid population decline or extinction. Over 10% (18 species) of Australian marsupials have already become extinct in the past two centuries, a rate significantly above the global mammal average of 1.4% (Schipper et al. 2008). Alarming declines and extinctions of Australian marsupials have continued unabated since the mid nineteenth century and approximately 40% of Australian marsupials are currently classified as threatened (i.e. Vulnerable, Endangered or Critically Endangered) in the IUCN Red List (Woinarski & Fisher 2023). No marsupial species from New Guinea or Wallacea is recognized to have become extinct in the last 200 years, but two are currently flagged as "Possibly Extinct" (*Phalanger matanim* and *Dendrolagus mayri*; Woinarski & Fisher 2023). Although fewer in number, American marsupials are similarly threatened, with two species assigned as Critically Endangered (*Marmosops handleyi* and *Monodelphis unistriata*; IUCN 2025), while several others have not yet been assessed (Martin & Carmignotto 2024).

Compiling comprehensive databases is essential to enable identification of large-scale patterns, conduct robust comparative analyses, and support evidence-based conservation decisions (Strier et al. 2010; Runting et al. 2020). Despite their ecological and evolutionary importance, much of the data on the life history and ecology of marsupials are scattered across multiple sources (e.g. de Magalhães & Costa 2009; Jones et al. 2009; Wilman et al. 2014) or underrepresented in databases and comparative studies on mammals (e.g. Promislow & Harvey 1990; Heppell et al. 2000; Oli & Dobson 2003; Healy et al. 2019). Centralizing information on the ecology and life history of marsupials in a unified database represents a crucial step in promoting a deeper understanding of marsupial adaptations, and facilitating the inclusion of this group in global analyses of mammals, vertebrates, and the animal kingdom as a whole, and thereby contributing significantly to improving our understanding of this taxonomic group and subsequent ability to guide conservation efforts.

Here, we provide the most comprehensive database on the ecology and life history of marsupials developed by our working group - The Marsupial Database Initiative. The Marsupial Database stores a curated collection of data on 414 extant and recently extinct marsupial species from all seven modern orders (Dasyuromorphia, Didelphimorphia, Diprotodontia, Microbiotheria, Notoryctemorphia, Paucituberculata, Peramelemorphia) native to 34 countries in the Americas and Australasia. The database contains 16,005 records of 35 traits describing anatomical, physiological, phenological and reproductive characteristics, and information on species' ecology and current conservation status. Data were collected from 42 sources, comprising published databases and other relevant sources of information. By providing a centralized repository of data on marsupial ecology and life history, The Marsupial Database facilitates comparative analyses of ecological and evolutionary patterns within the group, and improves our understanding of marsupial trait diversity and the ecosystem functions they provide, in addition to filling in taxonomic gaps to aid conservation efforts of marsupials worldwide.

Class I. Data Set Descriptors

A. Data set identity: The Marsupial Database: A comprehensive dataset on the ecology and life history of American and Australasian marsupials

B. Data set identification code: trait_database.csv, trait_sources.csv

C. Data set description

1. Originators:

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2. Abstract:

Marsupials are an important but typically neglected group of mammals that have been overlooked in many comparative analyses of vertebrate ecology and life-history evolution. In order to address this knowledge bias, we have developed The Marsupial Database. The Marsupial Database contains traits for a phylogenetically diverse set of 414 extant and recently extinct (last 200 years) species from all seven modern marsupial orders (Dasyuromorphia, Didelphimorphia, Diprotodontia, Microbiotheria, Notoryctemorphia, Paucituberculata, Peramelemorphia) native to 34 countries in the Americas and Australasia. The database comprises 16,005 records of 35 traits describing anatomical, physiological, phenological and reproductive characteristics, as well as information on species' ecology and current conservation status. Data were collected

from 42 sources, comprising published databases and other relevant sources of information. By providing a centralized repository of marsupial ecological and life history traits, The Marsupial Database facilitates analyses of ecological and evolutionary patterns within the group, and also encourages inclusion of marsupials in comparative studies of mammals, vertebrates and the entire animal kingdom.

D. Key words/phrases: body mass; comparative analyses; diet; life history; macroecology; mammal; phenology; physiology; population density; reproduction; survival; trait; vertebrate.

Class II. Research origin descriptors

A. Overall project description:

1. Identity: Information on the ecology and life history of American and Australasian marsupials gathered from published databases, books and papers with data compilation. These include published papers, Masters theses, and PhD dissertations, as well as unpublished data.

2. Originators:

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3. **Period of study:** Not applicable.

4. **Objectives:** To build a comprehensive database on the ecology and life history of American and Australasian marsupials. Our database is intended to serve as a resource for comparative studies and macroecological analyses.

5. **Abstract:** Same as above.

6. **Sources of funding:** The compilation of this dataset was supported by the Australian Alumni Grants Round 2023-2024 of the Australian Embassy in Brazil. MSF was supported by the Long-Term Ecological Research program (PELD, site MCF) of the National Council for Scientific and Technological Development of Brazil (Conselho Nacional de Desenvolvimento Científico e Tecnológico - CNPq). MVV was supported by grants from CNPq and Carlos Chagas Foundation for Research Support of the Rio de Janeiro State (Fundação Carlos Chagas de Amparo à Pesquisa do Estado do Rio de Janeiro - FAPERJ). DA was supported by grants from CNPq, CAPES and FACEPE. NL was supported by the Long-Term Ecological Research program (PELD, site TSMG) of the National Council for Scientific and Technological Development of Brazil (Conselho Nacional de Desenvolvimento Científico e Tecnológico -CNPq), and Foundation for Research Support of Minas Gerais State (FAPEMIG). JNGW was supported by CAPES.

B. **Specific subproject description**

1. **Site description:** Global trait data compilation for extant and recently extinct mammals from published sources.

2. **Experimental or sampling design:** Not applicable.

3. **Research methods:**

a. Taxonomy and systematics: Taxonomy and nomenclature were based on the updated checklist of American and Australasian marsupials found in Astúa et al. (2023) and Baker et al. (2023) respectively, the updated list of native species of Brazil conducted by the Taxonomy Committee of the Brazilian Society of Mastozoology (Abreu et al. 2024), and the current list provided by the Australasian Mammal Taxonomy Consortium (AMTC 2024). Nomenclatural mismatches due to taxonomic changes and misspellings were checked by experts in each marsupial order and were assigned to current taxonomic nomenclatures. Nomenclatural and taxonomic changes fell into two categories: genus and/or specific epithet change, and new species discovered. For the first, data were kept unchanged. For the second, no data were included when the species was recently described. When a new species resulting from a species split in taxonomy occurred, we analyzed case-by-case and the data were linked to the appropriate species by analyzing the original source of data. For example, the genus *Dasycercus* was considered to be two species: *Dasycercus cristicauda* and *Dasycercus blythi*, with the previously named *Dasycercus hillieri* considered a junior synonym of *D. cristicauda*. Recently, Newman-Martin et al. (2023) confirmed the validity of *D. hillieri* and indicated that much of the modern *D. cristicauda* material should be reassigned to *D. hillieri*. Subspecies-specific data were not differentiated in this database. Data were kept unchanged and assigned to the species.

b. Data sources: A total of 42 data sources including published databases, books and papers with data compilation were used to build this database. Table 1 presents the databases used for each variable. The trait_sources.csv spreadsheet shows the original source of the compiled data present in the same cell as the trait_database.csv spreadsheet.

Table 1. Data sources used to build the Marsupial Database. Identity - Unique variable name; Source - Data source.

Identity	Source
Adult body mass (g)	Amador & Gianini 2016; Ashwell 2008; Battistella et al. 2019; Buckley et al. 2018; Cássia-Silva & Sales 2019; Collett 2018; de Magalhaes & Costa 2009; Faurby et al. 2018; Fisher et al. 2001; Gonzalez-Voyer et al. 2016; Heldstab et al. 2018; Jackson 2003; Jones et al. 2009; McNab 2008; Moura et al. 2024; Myhrvold et al. 2015; Pacifici et al. 2013; Paglia et al. 2012; Soria et al. 2021; Todorov et al. 2021; Williams et al. 2010; Wilman et al. 2014; Wilson & Mittermeier 2015[1]
Adult female body mass (g)	Ferreira et al. 2023; Fisher et al. 2001; Myhrvold et al. 2015; Russell 1982; Russell 1984; Smith & Lee 1984; Weisbecker et al. 2013; Williams et al. 2010; Wilson & Mittermeier 2015[1]
Adult male body mass (g)	Jackson 2003; Jones et al. 2009; Myhrvold et al. 2015; Rose et al. 1997; Weisbecker et al. 2013; Williams et al. 2010; Wilson & Mittermeier 2015[1]
Gestation length (d)	Cássia-Silva & Sales 2019; Collett 2018; de Magalhães & Costa 2009; Fisher et al. 2001; Jackson 2003; Jones et al. 2009; Myhrvold et al. 2015; Soria et al. 2021; Wilson & Mittermeier 2015[1]
Number of neonates	Wilson & Mittermeier 2015[1]
Litter size	Battistella et al. 2019; Cássia-Silva & Sales 2019; Collett 2018; de

	Magalhães & Costa 2009; Eisenberg & Wilson 1981; Ferreira et al. 2023; Fisher et al. 2001; Gonzalez-Voyer et al. 2016; Jackson 2003; Jones et al. 2009; Myhrvold et al. 2015; Russell 1982; Soria et al. 2021; Todorov et al. 2021; Williams et al. 2010; Wilson & Mittermeier 2015[1]
Number of reproductive events (y)	Cássia-Silva & Sales 2019; Collett 2018; de Magalhães & Costa 2009; Jackson 2003; Jones et al. 2009; Myhrvold et al. 2015; Smith & Lee 1984; Soria et al. 2021; Williams et al. 2010; Wilson & Mittermeier 2015[1]
Generation length (d)	Soria et al. 2021; Pacifici et al. 2013
Age at weaning (d)	Cássia-Silva & Sales 2019; de Magalhães & Costa 2009; Fisher et al. 2001; Gonzalez-Voyer et al. 2016; Hood 2020; Jackson 2003; Jones et al. 2009; Myhrvold et al. 2015; Smith & Lee 1984; Soria et al. 2021; Todorov et al. 2021; Wilson & Mittermeier 2015[1]
Inter-birth interval (d)	de Magalhães & Costa 2009; Fisher et al. 2001; Jones et al. 2009; Myhrvold et al. 2015; Soria et al. 2021; Wilson & Mittermeier 2015[1]
Age at first reproduction (d)	de Magalhães & Costa 2009; Ferreira et al. 2023; Fisher et al. 2001; Hood 2020; Jackson 2003; Jones et al. 2009; Myhrvold et al. 2015; Pacifici et al. 2013; Soria et al. 2021; Williams et al. 2010; Wilson & Mittermeier 2015[1]
Age at last reproduction (d)	Ferreira et al. 2023; Meyer-Gleaves 2008
Maximum lifespan (y)	Carey & Judge 2000; Collett 2018; de Magalhães & Costa 2009; Fisher et al. 2001; Hood 2020; Jones et al. 2009; Myhrvold et al. 2015; Pacifici et al. 2013; Smith & Lee 1984; Soria et al. 2021; Tidiere et al. 2016; Williams et al. 2010; Wilson & Mittermeier 2015[1]
Mass at birth (g)	de Magalhães & Costa 2009; Fisher et al. 2001; Jones et al. 2009; Myhrvold et al. 2015; Russell 1984; Soria et al. 2021
Mass at pouch vacation (g)	Fisher et al. 2001; Russell 1982
Mass at weaning (g)	de Magalhães & Costa 2009; Fisher et al. 2001; Jones et al. 2009; Myhrvold et al. 2015; Russell 1982; Smith & Lee 1984; Soria et al. 2021
Mass at maturity (g)	Fisher et al. 2001; Myhrvold et al. 2015; Wilson & Mittermeier 2015[1]
Testicular mass (g)	Rose et al. 1997; Wilson & Mittermeier 2015[1]

Pouch-young survival (%)	Russell 1982
Juvenile survival (%)	Ferreira et al. 2023; Russell 1982; Wilson & Mittermeier 2015[1]
Adult survival (%)	Ferreira et al. 2023
Mean group size	Fisher et al. 2001; Jones et al. 2009; Qiu et al. 2022; Wilson & Mittermeier 2015[1]
Social organization	Qiu et al. 2022; Russell 1984; Todorov et al. 2021; Wilson & Mittermeier 2015[1]
Social system categorization	Jackson 2003; Qiu et al. 2022; Russell 1984; Smith & Lee 1984; Todorov et al. 2021; Wilson & Mittermeier 2015[1]
Mating system	Rose et al. 1997; Russell 1984; Smith & Lee 1984; Todorov et al. 2021; Wilson & Mittermeier 2015[1]
Basal metabolic rate (mLO^2/h)	Ashwell 2008; Buckley et al. 2018; de Magalhães & Costa 2009; Jones et al. 2009; McNab 2008
Field metabolic rate (mL CO_2/g/h)	Ashwell 2008; Todorov et al. 2021
Hibernation/torpor	Buckley et al. 2018; Heldstab et al. 2018; McNab 2008; Soria et al. 2021; Todorov et al. 2021; Turbill et al. 2011; Wilson & Mittermeier 2015[1]
Population density (ha-1)	Fisher et al. 2001; Gonzalez-Voyer et al. 2016; Jones et al. 2009; Santini et al. 2018; Soria et al. 2021; Todorov et al. 2021; Wilson & Mittermeier 2015[1]
Activity period	Ferreira 2023; Fisher et al. 2001; Jones et al. 2009; Russell 1984; Soria et al. 2021; Todorov et al. 2021; Williams et al. 2010; Wilman et al. 2014; Wilson & Mittermeier 2015[1]
Shelter type	Fisher et al. 2001; Todorov et al. 2021; Williams et al. 2010; Wilson & Mittermeier 2015[1]
Strata use	Fisher et al. 2001; Paglia et al. 2012; Soria et al. 2021; Williams et al. 2010; Wilman et al. 2014; Wilson & Mittermeier 2015[1]
Diet type	Fisher et al. 2001; Gainsbury et al. 2018; Kissling et al. 2014; Pineda-Munoz & Alroy 2014; Soria et al. 2021; Todorov et al. 2021; Williams et al. 2010; Wilman et al. 2014; Wilson & Mittermeier 2015[1]
Habitat	IUCN 2025[2]; Wilson & Mittermeier 2015[1]
IUCN red list categories	IUCN 2025[2]

[1] The Wilson & Mittermeier (2015) data comes from data compiled by several authors in each chapter of the book.
[2] The IUCN (2025) data were obtained from each assessment conducted by multiple authors for each species.

c. **Data compilation:** We conducted a bibliographical search for trait databases and data included in other relevant publications in August 2024. We searched for relevant data combining keywords relevant to the target group (“marsupial*”, “mammal*”, “vertebrate*”), the type of source (“database*”, “dataset*”, “data”) and the target information (“trait*”, “life-history trait*”, “ecology”) in Web of Science and Google Scholar. We also included other sources discovered by the snowball principle, i.e. papers and databases cited in the selected sources, and indicated by our group of experts. We reviewed 42 of these data sources, resulting in 16,005 data points on the ecology and life history of marsupials.

Whenever possible, we collected three separate measurements or observations for each species. This approach was intended to capture variability within the species and get a more representative picture of the trait's value for that species. Some data sources presented both species’ average data and raw data. Throughout the data collection, we opted to compute the mean value of the trait per species; raw data were only included when these were the only source of information. We also prioritized the most accurate data (i.e., included as many decimal places as were available) whenever possible, and selected data from wild specimens rather than captive ones. We found that many data sources included information from the same databases and other similar sources. To avoid pseudoreplication, we checked all the original data sources and removed overlapping or conflicting data. We considered only species-specific reported data, i.e.

direct observations. Imputed data, and mean values of congenerics and confamilials were not included in the database. For every species, the variable-specific source is referenced in a separate source dataset (trait_sources.csv).

d. Data transformation: Most traits were homogenous amongst sources and could be coalesced together with minimal (i.e. only changing measurement units) or no transformations. The following traits required minimal or more complex transformations:

- **Adult body mass, Adult male body mass and Adult female body mass, Mass at birth, Mass at pouch vacation, Mass at weaning, Mass at maturity and Testicular mass**: Data were converted from kilograms to grams. When range data were available, the maximum and minimum values were averaged.

- **Gestation length, Generation length, Age at weaning, Inter-birth interval, Age at first reproduction and Age at last reproduction:** Data were converted from years to days. When range data were available, the maximum and minimum values were averaged.

- **Generation length:** Some data on generation length originated from the Pacifici et al. (2013) database on Generation length for Mammals, which estimated generation length from information on species' age at first reproduction and reproductive life span by applying the methodology described in the IUCN Red List Guidelines. For more details, see Pacifici et al. (2013).

- **Number of reproductive events and Maximum lifespan**: Data were converted from days to years. When range data were available, the maximum and minimum values were averaged. For maximum lifespan, we kept the maximum value.

- **Social organization categories**: In the absence of specific data on social organization, information presented in Todorov et al. (2021) was considered and species were classified as solitary or social.

- **Basal metabolic rate:** Data in Watts and kilojoules per hour were converted to mL O_2 h^{-1}. Values reported in Watts were converted assuming a factor of 179.1 mL O_2 h^{-1} W^{-1} and values reported in kilojoules per hour were converted assuming a factor of 49.75 mL O_2 h^{-1} kJ^{-1} (Buckley et al. 2018; Schmidt-Nielsen, 1997).

- **Field metabolic rate**: Data in kilojoules per day were converted to ml CO_2 g^{-1} h^{-1} assuming a factor of 47.4 ml CO_2 and dividing by the mean body mass of each species in the database (Schmidt-Nielsen, 1997).

- **Population density:** Data were converted from individuals/kilometer to individuals/hectare.

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Class III. Data set status and accessibility

A. Status

1. **Latest update: Date of last modification of data set:** June 2025

2. **Latest archive date: Date of last data set archival:** Not applicable.

3. **Metadata status: Date of last metadata update and current status:** Last update on June 26, 2025, version submitted.

4. **Data verification:** Data were checked and inconsistent values such as typographical errors, incorrectly spelled scientific names and trait measures that did not make sense biologically (cross-checked with the original descriptions) were either manually corrected (when possible) or removed from the database. Data verification was conducted by marsupial specialists as following: Natália Oliveira Leiner and Diego Astúa (Order Didelphimorphia), Natasha Harrison (Order Peramelemorphia), Christopher R. Dickman (Order Dasyuromorphia), Diana O. Fisher (Order Diprotodontia; possums and gliders) and Graeme Coulson (Order Diprotodontia; macropods). The taxonomic status of the species was verified by the expert authors. In

the bibliographic records, taxonomic updates were made based on the most recent literature (see Research methods 2a).

B. Accessibility

1. **Storage location and medium:** Data and metadata are available as Supporting Information in Data S1. The dataset is also available in Figshare at https://doi.org/xxx

2. **Contact persons:** For general inquiries about the dataset, contact: Mariana Silva Ferreira. Federal University of Rio de Janeiro (UFRJ), Institute of Biology, Department of Ecology, Rio de Janeiro – RJ, Brazil. Email: msferreira84@gmail.com

3. **Copyright restrictions:** The Marsupial Database is free from copyright or proprietary restrictions. Please cite this data paper when using the data in publications or scientific presentations.

4. **Proprietary restrictions:**

a. **Release date:** Not applicable.

b. **Citation:** Ferreira, M. S. et al. 2025. "The Marsupial Database: A comprehensive dataset on the ecology and life history of American and Australasian marsupials." *Ecology* xx(x): exxxx. https://doi.org/xxx

c. **Disclaimer(s):** Please cite this data paper and all relevant underlying data sources (found in trait_sources.csv) when the data are used in publications or scientific presentations. We also request that researchers inform us of how they are using the data.

5. **Costs:** None.

Class IV. Data structural descriptors

A. Data set file

1. **Identity:**

1. trait_database.csv
2. trait_sources.csv

2. **Size:**

1. 16,005 records (including header) and 40 fields. Total file size is 349 KB.
2. 16,005 records (including header) and 40 fields. Total file size is 481 KB.

3. **Format and storage mode:** The dataset is downloadable as a single zipped archive, DataS1.zip (54 KB), which contains two files stored as comma-separated values (.csv).

4. **Header information:** The first rows of all files contain variable names (see Class IV Section B, Table 2).

5. **Alphanumeric attributes:** Mixed.

6. **Special characters/fields:** Missing fields are coded as NA.

7. **Authentication procedures:** Expert validation and independent double-checking by researchers were conducted to ensure the accuracy of the database.

B. Variable information

1. **Variable identity:** See Table 2.

2. **Variable definition:** See Table 2.

3. **Units of measurement:** See Table 2.

Table 2. Variable information of trait_database.csv and trait_sources.csv. Identity - Unique variable name; Definition - precise definition of variables in the database; Data type - type of value that can be stored in a variable or data field; Values - values, range of values or number of categories; Completeness - total percentage of data fields filled in the database (percentage per species).

Identity:	**order**

Definition:	Order to which the species belongs.
Data type:	Character
Values:	7 order names
Completeness:	100% (100%)

family

Definition:	Family to which the species belongs.
Data type:	Character
Values:	22 family names
Completeness:	100% (100%)

genus

Definition:	Genus to which the species belongs.
Data type:	Character
Values:	91 genus names
Completeness:	100% (100%)

species

Definition:	Specific epithet.
Data type:	Character
Values:	382 specific epithet
Completeness:	100% (100%)

genus_species

Definition:	Scientific name of a species.

Data type:	Character
Values:	414 species name
Completeness:	100% (100%)

adult_body_mass_g

Definition:	The mean body mass of adult individuals in grams (g).
Data type:	Numeric (float)
Values:	Estimates range from 4.25 g to 49,500.00 g
Completeness:	71.50% (83.33%)

adult_female_body_mass_g

Definition:	The mean body mass of adult females in grams (g).
Data type:	Numeric (float)
Values:	Estimates range from 4.20 g to 31,900.00 g
Completeness:	36.63% (56.28%)

adult_male_body_mass_g

Definition:	The mean body mass of adult males in grams (g).
Data type:	Numeric (float)
Values:	Estimates range from 4.20 g to 57,000.00 g
Completeness:	34.70% (56.28%)

gestation_length_d

Definition:	The duration of fetal growth in days (d).
Data type:	Numeric (float)

Values:	Estimates range from 11 days to 63 days.
Completeness:	29.07% (41.06%)

number_of_neonates

Definition:	Total number of offspring born per litter per female(s), counted immediately after birth.
Data type:	Numeric (integer)
Values:	Estimates range from 5 to 30 individuals.
Completeness:	1.29% (3.14%)

litter_size

Definition:	Number of offspring born per litter per female(s), counted after birth, and attached to the teats.
Data type:	Numeric (float)
Values:	Estimates range from 1 to 16 individuals.
Completeness:	57.81% (67.15%)

number_of_reproductive_events_y

Definition:	The average number of reproductive events/bouts per female per year known for that population.
Data type:	Numeric (float)
Values:	Estimates range from 0.5 to 4 events per year.
Completeness:	33.66% (47.10%)

generation_length_d

Definition: The average age of parents of the current cohort (i.e. newborn individuals in the population), reflecting the turnover rate of breeding individuals in a population in days (d).

Data type: Numeric (float)

Values: Estimates range from 341.28 days to 3,650.00 days.

Completeness: 8.53% (25.60%)

age_at_weaning_d

Definition: The age when primary nutritional dependency on the mother ends and independent foraging begins to make a major contribution to the offspring's energy requirements in days (d).

Data type: Numeric (float)

Values: Estimates range from 12 days to 900 days.

Completeness: 34.86% (44.93%)

inter-birth_interval_d

Definition: The length of time between successive births by the same female(s) after a successful litter in days (d).

Data type: Numeric (float)

Values: Estimates range from 52.50 days to 851.00 days.

Completeness: 29.87% (37.68%)

age_at_first_reproduction_d

Definition: The age of first successful copulation leading to the birth of young in days (d).
This variable does not include gestation and is only recorded for females.

Data type: Numeric (float)

Values:	Estimates range from 49 days to 1,440.00 days.
Completeness:	32.69% (42.03%)

age_at_last_reproduction_d

Definition:	The age when no successful copulation occurred from that period onwards in days (d). This variable is only recorded for females.
Data type:	Numeric (float)
Values:	Estimates range from 474.50 days to 5,110.00 days.
Completeness:	4.51% (9.18%)

maximum_lifespan_y

Definition:	The oldest age recorded for a species in years (y). Maximum lifespan represents a single data point, not an average. Estimates are recorded for wild and captive populations, males and females.
Data type:	Numeric (float)
Values:	Estimates range from 1 year to 30.40 years.
Completeness:	34.70% (51.21%)

mass_at_birth_g

Definition:	Mass of individual young immediately after birth or up to an age of seven days after birth in grams (g).
Data type:	Numeric (float)
Values:	Estimates range from 0.0049 g to 1 g
Completeness:	12.96% (17.87%)

mass_at_pouch_vacation_g

Definition:	Mass of individual young after the permanent exit from the pouch or after young permanently left in a nest in grams (g). Estimates are recorded for males and females.
Data type:	Numeric (float)
Values:	Estimates range from 0.5 g to 5,700.00 g
Completeness:	8.45% (16.18%)

mass_at_weaning_g

Definition:	Mass of individual young after weaning in grams (g). Estimates are recorded for males and females.
Data type:	Numeric (float)
Values:	Estimates range from 2 g to 12,000.00 g
Completeness:	18.84% (27.78%)

mass_at_maturity_g

Definition:	Mass of individuals of first successful copulation leading to the birth of young in grams (g). Estimates are recorded for males and females.
Data type:	Numeric (float)
Values:	Estimates range from 5 g to 22,000.00 g
Completeness:	4.11% (11.11%)

testicular_mass_g

Definition:	The testis mass of an adult male in grams (g).
Data type:	Numeric (float)

Values:	Estimates range from 0.05 g to 54.57 g
Completeness:	3.38% (9.66%)

pouch-young_survival_%

Definition:	Percentage of offspring that survived the initial phase of development (from birth to weaning). Estimates are recorded for females.
Data type:	Numeric (float)
Values:	Estimates range from 38% to 100%
Completeness:	0.72% (2.17%)

juvenile_survival_%

Definition:	Percentage of young (not yet capable of reproduction) that survived the post-weaning phase. Estimates are recorded for females.
Data type:	Numeric (float)
Values:	Estimates range from 10% to 96%
Completeness:	4.11% (7.97%)

adult_survival_%

Definition:	Percentage of surviving adults after first reproduction. Estimates are recorded for females.
Data type:	Numeric (float)
Values:	Estimates range from 50% to 100%
Completeness:	3.62% (7.00%)

mean_group_size

Definition: Number of individuals in a group that spend most of their daily time together.

Data type: Numeric (float)

Values: Estimates range from 1 to 25 individuals

Completeness: 19.24% (38.41%)

social_organization

Definition: The social patterns within a population, i.e., the set of individuals that interact with each other on different levels.

Data type: Ordinal

Values: Species were classified in seven categories following Russell 1984 and Qiu et al. 2022:

- S - solitary
- MF - pair-living,

and four forms of group-living

- MFF - single male multiple female group
- FMM - single female multiple male group
- sex-specific group: group of only males or only females
- MMFF - multi-male multi-female group.
- G - group-living with unknown composition

Combinations of categories were also recorded.

Completeness: 24.40% (42.03%)

social_organization_categories

Definition: Same as above.

Data type: Binary

Values: Species were classified in two categories:

- solitary
- social

Combination of categories was also recorded.

Completeness: 26.89% (42.51%)

mating_system

Definition: The general pattern by which males and females mate.

Data type: Ordinal

Values: Species were classified in five categories:

- polygynous - one male mating with multiple females or harem
- polyandrous - one female mates with multiple males
- promiscuous - females mate with multiple males, and males mate with multiple females
- monogamous - male and one female are paired for at least one breeding season
- complex - polygamous/monogamous

Completeness: 12.00% (24.88%)

basal_metabolic_rate_mlO2/h

Definition: The rate of energy expenditure per unit time at rest, measured at thermoneutrality (i.e., experiencing neither heat nor cold stress) in milliliters of oxygen per hour (mlO_2/h).

Data type: Numeric (float)

Values: Estimates range from 10.39 mlO_2/h to 5,921.05 mlO_2/h

Completeness: 15.22% (18.36%)

field_metabolic_rate_mlCO2/g/h

Definition: The total rate of

energy expenditure by a free-living animal in a natural environment in milliliters of carbon dioxide per gram per hour ($mlCO_2/g/h$).

Data type: Numeric (float)

Values: Estimates range from 0.11 $mlCO_2/g/h$ to 8.46 $mlCO_2/g/h$

Completeness: 4.91% (9.18%)

hibernation_torpor

Definition: Physiologically controlled reduction of metabolic rate and body temperature experienced by small endotherms when facing adverse periods, such as cold temperatures, food shortages and droughts. Torpor lasts less than 24 hours, while hibernation is defined by bouts of inactivity lasting from some days to several weeks (Ruf and Geiser 2015). We grouped together both types of adaptations, considering them as an indicator of avoidance of adverse environmental conditions as in Soria et al. (2021).

Data type: Ordinal

Values: Species were classified in four categories:

- hibernation
- torpor
- hibernation/torpor
- no (no record of hibernation/torpor)

Completeness: 36.07% (60.63%)

population_density_ha-1

Definition: Number of individuals per hectare (ind/ha).

Data type: Numeric (float)

Values: Estimates range from 0.02 ind/ha to 297 ind/ha.

Completeness: 20.21% (30.92%)

activity_period

Definition: Time of the day in which a species carries out most of its activities.

Data type: Ordinal

Values: Species were classified in five categories following Bennie et al. 2014:

- diurnal - majority of activity occurs during the day
- nocturnal - majority of activity occurs during the night
- crepuscular-nocturnal - majority of activity occurs during twilight (periods of dawn and dusk) or not fully nocturnal
- crepuscular-diurnal - majority of activity occurs during twilight – periods of dawn and dusk) or not fully diurnal
- cathemeral - activity during the day and night

Completeness: 58.62% (78.26%)

shelter_type

Definition: Type of shelter or refuge species are known to use.

Data type: Ordinal

Values: Species were classified into three categories following Fisher et al. 2001:

- protected - burrow or constructed nest in tree hollow
- intermediate - tree canopy, hollow log, under rock, nest on ground or in soil crack
- open - under shrubs, in grass or shade of tree

Completeness: 35.67% (52.90%)

strat_use

Definition: Primary type of strata of habitat used by a species.

Data type: Ordinal

Values: Species were classified in six categories following Williams et al. 2010:

- arboreal
- terrestrial
- scansorial (arboreal/terrestrial)
- fossorial
- freshwater-terrestrial
- volant

Completeness: 41.63% (82.13%)

diet_type

Definition: Broad dietary classification (*dietary guild*) of each species, based on the main proportion of their diet.

Data type: Ordinal

Values: Species were classified in four broad categories following Fisher et al. 2001:

- 1 - >50% grass or browse: *herbivorous*
- 2 - seeds, grass, roots, leaves, fruit, and invertebrates: *omnivorous*
- 3 - nectar or fruit with invertebrates: *omnivorous*
- 4 - >50% invertebrates or vertebrates: *carnivorous*

Completeness: 62.40% (79.71%)

habitat_type

Definition: The major habitat/s in which a species occurs.

Data type: Ordinal

Values: Species were classified in nine broad categories following IUCN classification (2025):

- forest
- savanna
- shrubland
- grassland

- wetlands
- rocky areas
- caves and subterranean habitats
- desert
- artificial

Combinations of categories were also possible.

Completeness: 28.66% (83.57%)

IUCN_red_list_categories

Definition: The IUCN Red List categories of species at high risk of global extinction.

Data type: Ordinal

Values: Species were classified in nine categories using IUCN classification obtained in February 2025:

- NE - Not Evaluated
- DD - Data Deficient
- LC - Least Concern
- NT - Near Threatened
- VU - Vulnerable
- EN - Endangered
- CR - Critically Endangered
- EW - Extinct in the Wild
- EX - Extinct

Completeness: 100% (83.09%)

4. Data type

a. Storage type: See Table 2 in section Class IV. B. Data type.

b. List and definition of variable codes: See Table 2 in section Class IV. B. Values.

c. Range for numeric values: See Table 2 in section Class IV. B. Values.

d. Missing value codes: Missing information was classified as “NA”.

e. **Precision:** From 2 to 6, according to each variable.

Class V. Supplemental descriptors

A. Data summary:

This database evaluates a total of 414 marsupial species, comprising 128 species of the order Didelphimorphia, 3 of Microbiotheria, 7 of Paucituberculata, 2 of Notoryctemorphia, 31 of Peramelemorphia, 87 of Dasyuromorphia, and 156 of Diprotodontia. Among these, 18 species are known to be recently extinct (Peramelemorphia - 7 species; Dasyuromorphia - 4 species; Diprotodontia - 7 species). In total, 16,005 data records were compiled on 35 ecological and life-history traits from 42 different sources.

The order with the largest proportional number of records was Diprotodontia (32.80%), followed by Dasyuromorphia (29.36%; Figure 1). The three orders with the fewest records belonged to the American orders Didelphimorphia (15.32%), Microbiotheria (15.24%), and Paucituberculata (14.15%).

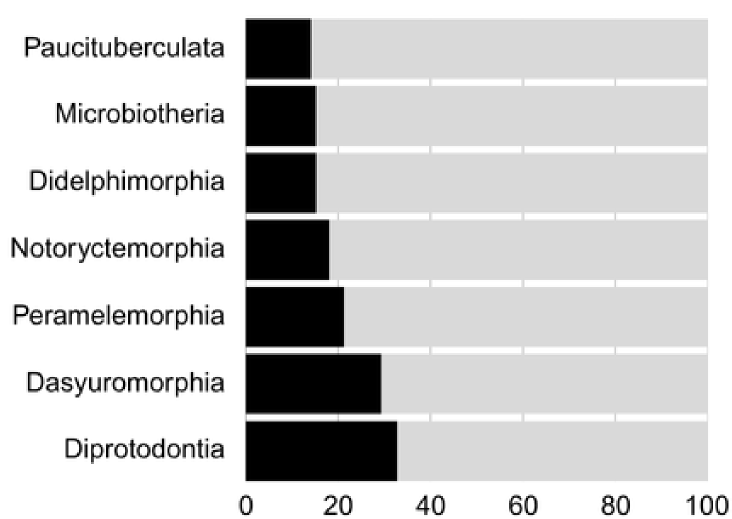

Figure 1. Proportional number of records per species per marsupial order. Order Microbiotheria (N = 48; 15.24%), Paucituberculata (N = 104; 14.15%), Didelphimorphia (N = 2,059; 15.32%), Dasyuromorphia (N = 2,682; 29.36%), Notoryctemorphia (N = 38; 18.10%), Peramelemorphia (N = 694; 21.32%) and Diprotodontia (N = 5,372; 32.80%). N = total number of records.

The distribution of data among orders was not uniform (Figure 2). Data related to ecological traits were more common than data related to reproduction, anatomy, physiology, and survival. The latter data were the least abundant, regardless of the taxonomic group evaluated. However, this pattern is not general for all families (Figure 3). Families belonging to the order Diprotodontia, Phascolarctidae, Tarsipedidae, and Vombatidae, presented data for virtually all traits in the database. In contrast, survival data are completely absent for some families present in the orders evaluated (Figure 3).

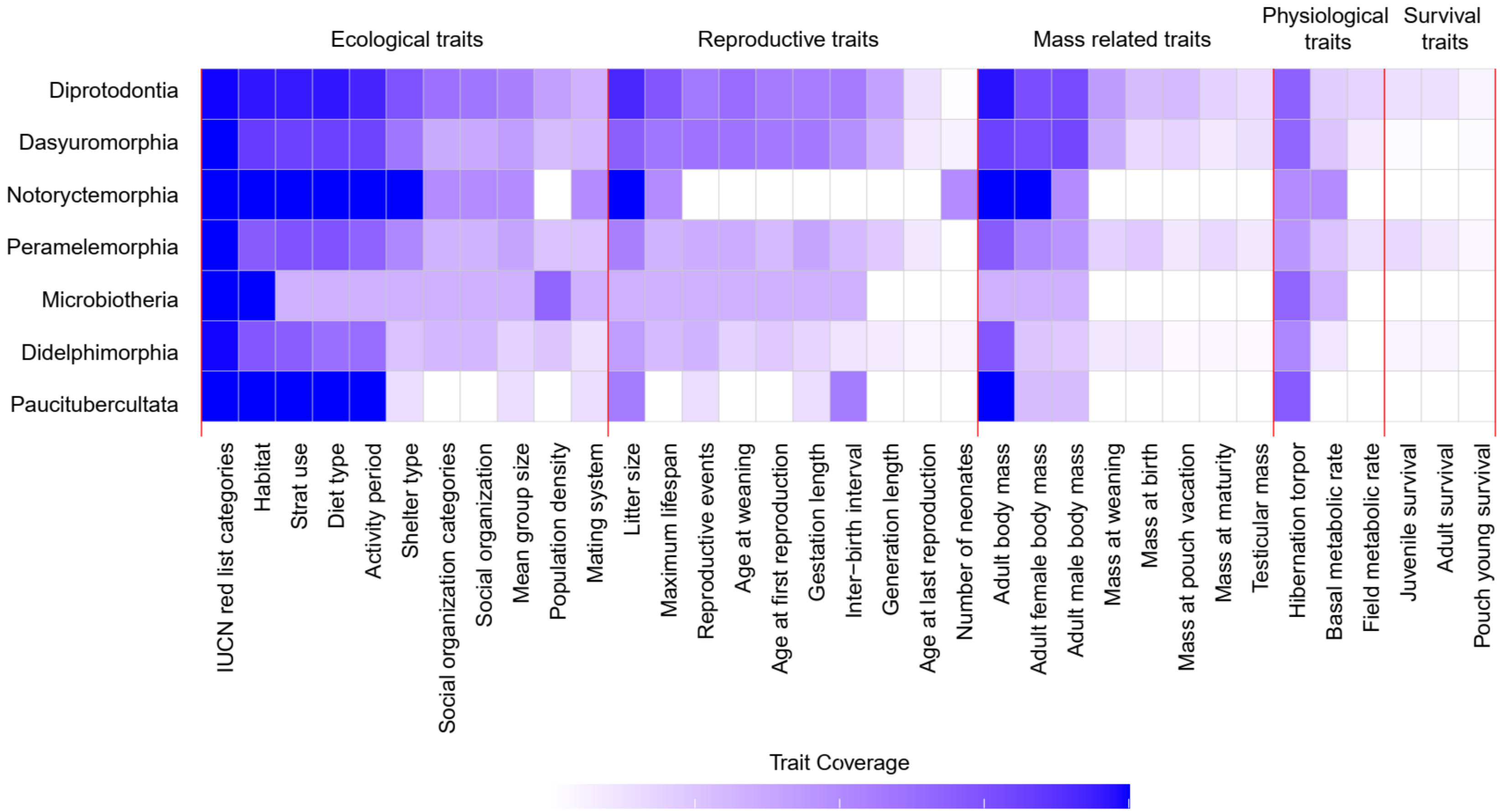

Figure 2. Ecological- and life-history trait coverage for seven marsupial orders present in The Marsupial Database.

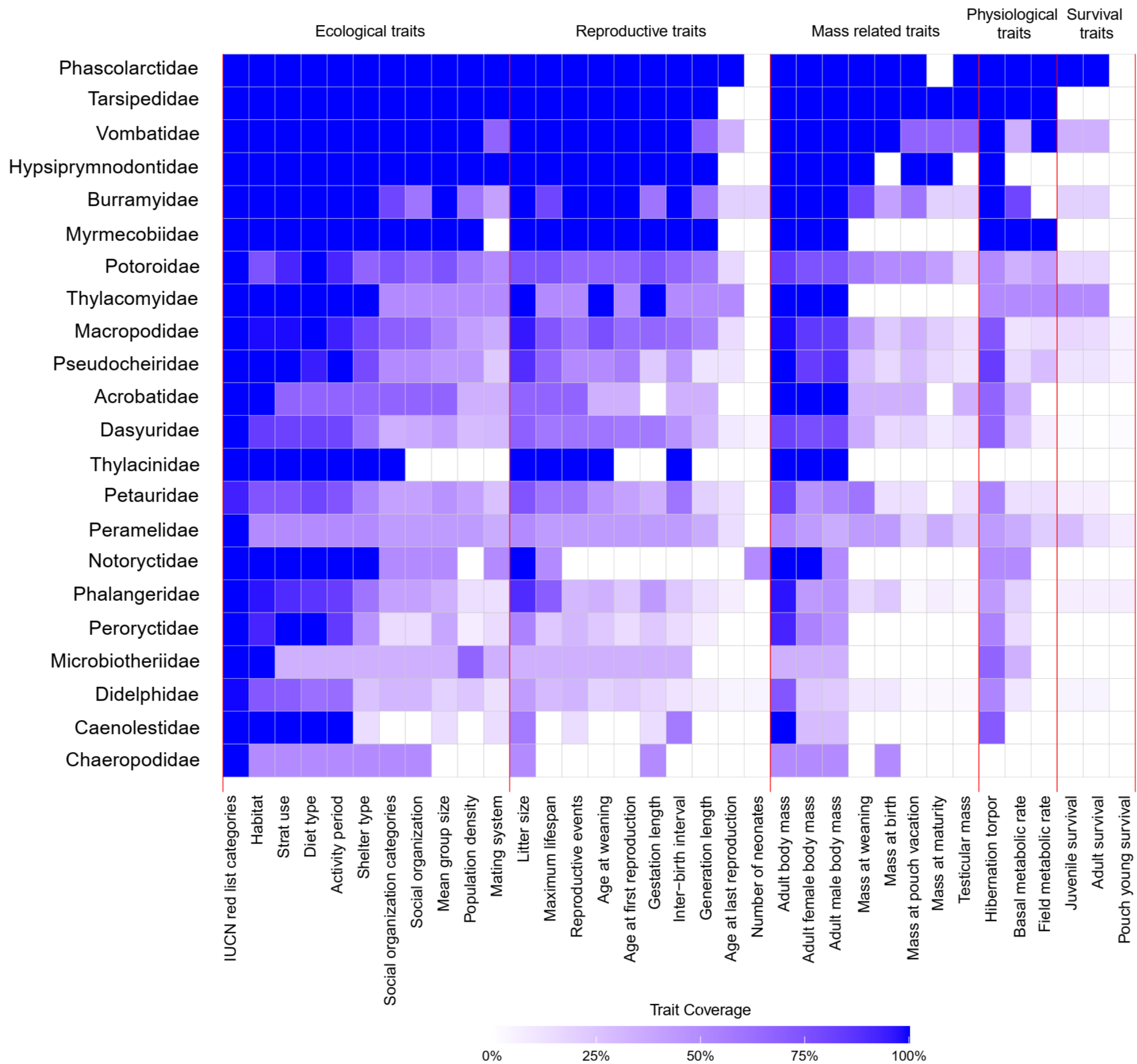

Figure 3. Ecological- and life-history trait coverage for 22 marsupial families present in The Marsupial Database.

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