**Title:**

The ShareTrait Entity-Relationship Model: a step toward building the ShareTrait database

**Date:** last modified on 2024-08-01

**Version:** 0.9.6

**Update:**

[2024-08-16] Not final version as it needs a few adjustments based on the last changes. The adjustments are based on removing non existing properties of the tables.

**Description:**

This document contains the definition of tables used for building the ShareTrait database version 1.0. Version 1.0 is the adaptation of the ShareTrait dataset version 1.0.0, the data portal for making trait data interoperable and reusable.

**Source:**

The ShareTrait Dataset Version 1.0.0 (DOI: <https://doi.org/10.5281/zenodo.8138904>) is the source used for the design and development for the conceptual model, the logical and physical model for the ShareTrait Database.

**Contributors:**

Brett Olivier, Irene Martorelli, Jacintha Ellers, Matty Berg, Wilco Verberk, FelixLeiva

**References:**

* ShareTrait Github repository: <https://github.com/ShareTraitProject/ShareTrait/tree/main/ShareTrait_DB>
* ShareTrait Zenodo repository: <https://zenodo.org/records/8138904>

**Diagram:**

* [ER Diagram](#_yijew6p3278l) ShareTraitDB-DOMELT-v1.0.png, date 2024-08-08

**Dataset column definition:**

The ShareTrait dataset contains 112 attributes annotated, defined in <https://github.com/ShareTraitProject/ShareTrait/blob/main/ShareTrait_DB/v1.0.0/3_release/ShareTrait_MetaData_v1.0.0.csv> . These annotations belong to 45 dataset records.

The 45 records of version 1.0.0, belong to 3 main traits defined as "Development", "Fecundity" and "Metabolic Rate".

For the development of the ShareTrait DataBase (ShareTrait DB), the ShareTrait DataSet attributes (ShareTrait DS) can be divided into blocks defined as Category blocks. Each Category contains a common collection of entities. For example, a Category defined as Publication may contain information about manuscript, journal, researcher, institute and so on.

Categories are not physical aspects of the database; the aim of these categories is to guide us to know which region/s of the database we are focusing on and to which relevant collection of entities we are dealing with. The colouring labels are used to distinguish these regions of interest.

### ER diagram – [01-08-2024] update version

# 

Logical model, name diagram: ShareTrait\_AllCat\_DOMEL\_v0.1.6, 2024-04-08

**A diagram of a company

Description automatically generated with medium confidence**

|  |  |
| --- | --- |
| **Category** | **Definition** |
| [Source](#_1mvzqxx2x7tw) | The research main source of information obtained from the scientific collection of investigations dealing with animal traits |
| [Organism](#_p99uq0iry1iu) | Contains information regarding the individual animal groups of interest |
| [Method](#_5ii8pw4d26pc) | Contains relevant information of the investigation applied to the organisms collected for the study |
| [Taxonomy](#_1y8lvfod7qgc) | Contains information regarding the classification of the organisms |
| [Environment](#_cje5e8o5ulg8) | Information belonging to the geographical site of where the data is collected |
| [Location](#_qbzxmp6zs23) | Geographical information regarding the spaces and physical items |

### Category Source

|  |  |  |  |
| --- | --- | --- | --- |
| **Category** | Source | | |
| **Definition** | Primary Relevant source of information for ShareTrait. Currently (v. 1.0.0), the information is made available by means of published datasets, relevant manuscripts, unpublished data and/or work, or direct contact with researchers | | |
| **Comment** | For Share Trait DataBase (STDB) v. 1.0.0, the dataset DOI is not a MANDATORY field, because of this, all other fields related to the DOI (e.g. dataset publisher, dataset licence, dataset version..) are defined as OPTIONAL fields. The fields that are MANDATORY are the primary key of the dataset (labelled as dataset\_pk) and the reference dataset id (labelled as sharetrait\_datasetid) that is required for mapping to ShareTrait dataset v. 1.0.0. Instead, as Manuscript is an Entity on its own, the DOI is a MANDATORY field. | | |
|  | | | |
| **Table Name** | Dataset | | |
| **Table Type** | Entity | | |
| **Definition** | Primary relevant information of the dataset study regarding a trait | | |
| **Comment** | For Share Trait DataBase (STDB) v. 1.0.0, the dataset DOI is not a MANDATORY field. Because of this, all other fields related to the DOI (e.g. dataset publisher, dataset licence, dataset version..) are defined as OPTIONAL fields. The fields that are MANDATORY are the primary key of the dataset (labelled as dataset\_pk) and the reference dataset id (labelled as sharetrait\_datasetid) that is required for mapping to ShareTrait dataset v. 1.0.0. | | |
| **attribute\_name** | **type** | **definition** | **example** |
| dataset\_pk | primary key, VARCHAR (30) | Primary Key of the Entity dataset, **MANDATORY** | TRADAT000001 |
| title\_dataset | TEXT | title of the dataset. It is usually obtained from the *title* attribute of the original data source. **OPTIONAL** | Overwintering strategies and life-history traits of different populations of Aphidius platensis along a latitudinal gradient in Chile |
| doi\_dataset | VARCHAR (256) | dataset DOI, provided in URL (doi\_dataset), **OPTIONAL** | <https://doi.org/10.5281/zenodo.7774767> |
| sharetrait\_datasetid | ID, TEXT | reference id to sharetrait dataset (dataset\_id), **MANDATORY** | Alfaro\_Tapia\_et\_al\_2022 |
| reference\_type | VARCHAR (64) | Indicate whether the reference corresponds to a primary or secondary reference (type\_of\_reference), **OPTIONAL** | primary |
| dataset\_type | VARCHAR (64) | type of dataset, **OPTIONAL** | dataset |
| dataset\_publisher | VARCHAR (64) | publisher of the dataset, **OPTIONAL** | zenodo |
| dataset\_licence | VARCHAR (64) | licence of the dataset (license-check), **OPTIONAL** | Creative Commons Attribution 4.0 International |
| dataset\_version | VARCHAR (64) | version of the dataset that is published, **OPTIONAL** | 1.0 |
| dataset\_citation | TEXT | complete citation of the dataset (full\_citation), **OPTIONAL** | Alfaro-Tapia, A., Alvarez-Baca, J. K., Tougeron, K., Lavandero, B., Le Lann, C., & Van Baaren, J. (2022). Overwintering strategies and life-history traits of different populations of Aphidius platensis along a latitudinal gradient in Chile (1.0) [Data set]. Zenodo. https://doi.org/10.5281/zenodo.7774767 |
| date\_publication | TEXT | ISO date of the publication, **OPTIONAL** | 2022-04-29 |
| year\_publication | INT | year of publication (year\_publication), **OPTIONAL** | 2022 |
| date\_contribution | VARCHAR (64) | contribution date for uploading the dataset in sharetrait, (date\_of contribution), **OPTIONAL** | 2022-08-01 |
| dataset\_trait | VARCHAR (64) | reference trait term used for the dataset, at the moment this is 1:1. **OPTIONAL** | development |
| dataset\_comment | TEXT | free text remarks regarding the dataset, relevant to population and location (comments\_reference), **OPTIONAL** | five Chilean populations of the aphid parasitoid Aphidius platensis. |
|  | | | |
| **Table Name** | Manuscript | | |
| **Table Type** | Entity | | |
| **Definition** | Information regarding the published article | | |
| **Comment** | The DOI value is a MANDATORY field for the Manuscript entity. | | |
| **attribute\_name** | **type** | **definition** | **example** |
| manuscript\_pk | primary key, VARCHAR (30) | PK of manuscript, **MANDATORY** | TRAMAN000001 |
| title\_manuscript | TEXT | title of the manuscript, **OPTIONAL** | Overwintering strategies and life-history traits of different populations of Aphidius platensis along a latitudinal gradient in Chile |
| doi\_manuscript | VARCHAR (256) | manuscript DOI, provided in URL (doi\_publication), **MANDATORY** | <https://doi.org/10.1127/entomologia/2021/1186> |
| type\_manuscript | VARCHAR (64) | type of manuscript, can be a journal article, published data method, software paper. **OPTIONAL** | article |
| manuscript\_publisher | VARCHAR (64) | publisher of the manuscript. **OPTIONAL** | Entomologia Generalis |
| manuscript\_citation | TEXT | full citation of manuscript used for download. For now the type of citation is not provided. **OPTIONAL** | Hermaniuk, Adam et al. “Low Temperature and Polyploidy Result in Larger Cell and Body Size in an Ectothermic Vertebrate.” *Physiological and biochemical zoology : PBZ* vol. 89,2 (2016): 118-29. doi:10.1086/684974 |
| date\_publication | TEXT | ISO date of publication. **OPTIONAL** | 2022-02-11 |
| year\_publication | INT | year of publication of the manuscript. **OPTIONAL** | 2022 |
| manuscript\_comment | TEXT | free text remark for manuscript. **OPTIONAL** | study belonging to a range of species |
|  | | | |
| **Table Name** | publication | | |
| **Table Type** | Relation | | |
| **Definition** | Association of a dataset to a published article | | |
| **Comment** | This association does not currently exist in sharetrait, however it is relevant as there can be more than 1 dataset associated to a manuscript, or there can be more than 1 manuscript associated to a dataset (i.e. ShareTrait dataset\_id) | | |
| **attribute\_name** | **type** | **definition** | **example** |
| dataset\_pk | primary key, VARCHAR (30) | Reference to Dataset entity (foreign key) | TRADAT000001 |
| manuscript\_pk | primary key, VARCHAR (30) | Reference to Manuscript entity (foreign key) | TRAMAN000001 |

**Association Rules for the Category Source**

**Relationship Dataset - Manuscript (through the Relational Table publication)**

* A dataset is a mandatory entity for ShareTrait that contains information about study of trait(s).
* A manuscript is an entity that contains information about a published article describing a study and it is mandatory to provide a DOI.
* A dataset may be published, in this case it is OPTIONAL to provide a DOI of the dataset.
* A dataset can be part of a *publication* but not necessarily. A dataset can be part of multiple publications (0,N). (This is why the original 1,1 relationship is not possible and manuscript cannot be an attribute of dataset)
* A manuscript to be in ShareTrait must at least describe a dataset, and a manuscript may reference and describe multiple datasets (1,N)

### Category Taxonomy

|  |  |  |  |
| --- | --- | --- | --- |
| **Category** | Taxonomy | | |
| **Definition** | Resource containing information about the systematic classification of organisms | | |
|  | | | |
| **Table Name** | Reference\_Taxonomy | | |
| **Table Type** | Entity | | |
| **Definition** | The reference taxonomy classification | | |
| **Notes** | For this version we define the taxonomic ranking complete list for facilitating the aggregation of data during the query (for example: (such as group by based on specific taxonomic levels. For future dev we will provide the ID url of the reference taxonomy. | | |
| **attribute\_name** | **type** | **definition** | **example** |
| taxonomy\_pk | PK | PK of taxonomic name, **MANDATORY** | TRATAX001 |
| scientific\_name | varchar(256) | complete full scientific name of the taxonomic name | Aphidius platensis Brethes, 1913 |
| taxonomy\_id\_ref | ID | taxonomic id of the reference taxonomy. The taxonomy\_id is then generic as the new attribute tax\_db will contain ott db type. (ott = open tree of life) | FD9T |
| taxonomy\_db\_ref | varchar(256) | taxonomic db full name | Catalogue of Life |
| taxonomy\_id\_url | text | taxonomic db url | http://www.ichneumonoidea.name/local.php?taxonidLC=90216058 |
| taxonomy\_db\_version | varchar(64) | taxonomy reference db version | [2024-03-26](https://www.catalogueoflife.org/data/metadata) |
| parent\_id | ID | parent id of taxonomic name if exists | 62D92 |
| parent\_name | text | Complete name of the parent of the scientific name | Aphidius |
| rank\_level | varchar(128) | taxonomic level type of the scientific name | species |
| phylum | varchar(128) | phylum of the scientific taxonomic name (phylum) | [Arthropoda](https://www.catalogueoflife.org/data/taxon/RT) |
| class | varchar(128) | class level of the scientific taxonomic name (class) | Insecta |
| order | varchar(128) | order level of the scientific taxonomic name (order) | [Hymenoptera](https://www.catalogueoflife.org/data/taxon/HYM) |
| family | varchar(128) | family level of the scientific taxonomic name (family) | [Braconidae](https://www.catalogueoflife.org/data/taxon/7D4) |
| genus | varchar(128) | genus level of the scientific taxonomic name (genus) | Aphidius |
| species | varchar(128) | Species level name (species\_ott) | Aphidius platensis |
| comments\_taxonomy | text | Any specific comments on the taxonomy naming (comments\_taxonomy) | Manually parsed the names from url |
|  | | | |
| **Table Name** | taxonomic\_label | | |
| **Table Type** | Relation | | |
| **Definition** | The reference taxonomic labelling mapped to the population observed | | |
| **attribute\_name** | **type** | **definition** | **example** |
| taxonomy\_pk | PK | reference to Ref\_Taxonomy (FK), **MANDATORY** | TRATAX001 |
| population\_pk | PK | reference to Population (FK), **MANDATORY** | TRAPOP001 |
| naming\_date | date | ISO date used for taxonomic labelling | 01-01-2024 |
| reference\_label | varchar(64) | Reference label given to the taxa db | COL |
| version\_name | varchar(128) | version of the taxonomic mapping | 26-03-2024 |

**Association Rules for the Category Taxonomy**

**Relationship Population - Taxonomy (through the Relation taxonomic\_label)**

* A population (group of individuals) can be identified with a species name by the researchers contributing to the study
* A population must be labelled with a scientific name and have an assigned official reference taxonomic name (1,1)
* A population may have multiple approved scientific names based on different reference resources (1,N)
* A taxonomic scientific name can be assigned to an population of individuals, but the same reference name can also be used to label many different individuals (0,N).

### Category Environment

|  |  |  |  |
| --- | --- | --- | --- |
| **Category** | Environment | | |
| **Definition** | Contextual information regarding the geographical site where a population occurs and has been observed | | |
|  | | | |
| **Table Name** | Site | | |
| **Table Type** | Entity | | |
| **Definition** | The surface area condition where the population is observed in its natural habitat | | |
| **attribute\_name** | **type** | **definition** | **example** |
| site\_pk | PK | PK of the site, **MANDATORY** | TRASIT001 |
| site\_name | PK | Name of the site | strawberrryfields |
| site\_realm\_general | varchar(256) | indicates where species inhabit (real\_general) | terrestrial |
| site\_realm\_specific | int | Specific details of the habitat (realm\_specific) | terrestrial |
| elevation\_value | decimal(8,2) | Elevation value of the position where the population has being observed (elevation\_value) | 268 |
| elevation\_unit | varchar(30) | Standard unit of elevation value | meter |
| temperature\_value | decimal(8,2) | (avg) air temperature of the site | 17 |
| temparature\_unit | varchar(30) | Standard unit for the temperature value | celcius |
| depth\_value | decimal(8,2) | Depth value where the organism is being observed (depth\_of\_collection) | 0.3 |
| depth\_unit | varchar(30) | Standard unit of the depth value | meter |
| Location\_description check if it goes here | | | |
| **Table Name** | occurrence | | |
| **Table Type** | Relation | | |
| **Definition** | The association to identify where a population occurs | | |
| **Notes** | This table may not have the relation with Place directly as currently hardly any natural observation occurrence provides spatial information | | |
| **attribute\_name** | **type** | **definition** | **example** |
| population\_pk | PK | PK of the population, **MANDATORY** | TRAIND001 |
| site\_pk | PK | PK of the geographical area, **MANDATORY** | TRASIT001 |
| observation\_date | date | The ISO date where a population is being observed in its natural habitat (yyyymmdd\_of\_collection) | 06-06-2023 |
| year\_collection | int | Year where the population is observed and collected for further investigation (year\_of\_collection) | 2023 |
| comments\_time | text | Some contextual free-text based on the point that the population is collected (comments\_timing) | Population observed under a pine tree in a warm evening |
| origin | varchar (128) | Defined term, Indicates the source where individuals were collected (origin) | field |

### Category Location

|  |  |  |  |
| --- | --- | --- | --- |
| **Category** | Location | | |
| **Definition** | Contextual information regarding the geographical site where a population occurs and has been observed | | |
|  | | | |
| **Table Name** | Place | | |
| **Table Type** | Entity | | |
| **Definition** | Rancagua Chile South America | | |
| **attribute\_name** | **type** | **definition** | **example** |
| place\_pk | PK | PK of taxonomic name, **MANDATORY** | TRAPLA001 |
| place\_name | varchar(256) | A place name of a location. For now there is no specification of what to provide for place\_name. There is no controlled way yet to define this | Rancagua |
| country\_name | varchar(256) | The country where the place is located | Chile |
| continent\_name | varchar(256) | A geographical collection of countries | South America |
|  | | | |
| **Table Name** | located\_in | | |
| **Table Type** | Relation | | |
| **Definition** | The association of a an area of interest with the reference geographical political naming system | | |
| **attribute\_name** | **type** | **definition** | **example** |
| site\_pk | PK | PK of the site, **MANDATORY** | TRASIT001 |
| place\_pk | PK | PK of the geographical area, **MANDATORY** | TRAPLA001 |
| latitude | DECIMAL(8,2) | Latitude, in decimal degrees (lat\_decimal) | 51.15530556 |
| longitude | DECIMAL(8,2) | Longitude value of the position of the site, in decimal degrees (long\_decimal) | 4.398777778 |
| comment\_location | text | Relevant notes about the location (comments\_location) | Population observed under a pine tree in a warm evening |

//add comments here and cardinalities

We have decided to define a site on its own such that it can be extended to provide more contextual information about the physical habitat, as for now with a few metadata fields.

Location gps positions is a choice to provide only between Site and Place as this depends on the relationship between population and site. A population can have different site observations, thus different

### 

### Category Organism

|  |  |  |  |
| --- | --- | --- | --- |
| **Category** | Organism | | |
| **Definition** | Primary Relevant source of information regarding the individual species that is being collected and described based on a condition and/or during a study of interest. Characteristics based on individuals are measured and these consist of morphological features and functionalities. | | |
|  | | | |
| **Table Name** | Population | | |
| **Table Type** | Entity | | |
| **Definition** | Information about the group of individuals sharing the same characteristics and located in the same place | | |
| **Notes** | The ShareTrait dataset does not currently contain a defined set of population, it refers to species reported record | | |
| **attribute\_name** | **type** | **definition** | **example** |
| population\_pk | PK | Defines if population reference provides measurements that are derived from a collection rather than individuals | TRAPOP001 |
| population\_name | varchar(256) | Reference to dataset naming of the collection/population | popid1 |
| population\_label | varchar(30) | Defines if population reference provides measurements that are derived from a collection rather than individuals | yes/no |
| pop\_description | text | Free text based characteristics worth to mention | A very big population, only decided to take a few |
| species\_reported | varchar(256) | species name given based on the study (species\_reported) | aphidius\_platensis |
| authority | text | comment containing year and name noted to the species (authority) | rare |
| population\_facts | text | Any relevant information specific for population if mentioned by author/article | Different populations of Aphidius platensis |
| comments | text | any relevant remarks regarding the species described | Species verified by multiple collectors |
|  | | | |
| **Table Name** | describe | | |
| **Table Type** | Relation | | |
| **Definition** | The reference of the dataset to a population observed and described for a study | | |
| **attribute\_name** | **type** | **definition** | **example** |
| dataset\_pk | PK | reference to resource | TRADAT001 |
| population\_id | PK | reference to specimen. This ID is generated | TRAPOP001 |
| date\_describe | text | Date when a population is described | 19 July 2018 |
| date\_iso | date | Standard ISO date | 2018/07/18 |
| year | int | Standard ISO year | 2018 |
|  | | | |
| **Table Name** | Individual | | |
| **Table Type** | Entity | | |
| **Definition** | Information about the physical individual observed and collected for the conduction of the study and the description of the trait. | | |
| **Notes** | The information provided in this entity belongs to the condition of the individual at the moment that has been collected. For example, age of individual is based on the moment of collection, but age can be also an attribute of experiment condition, in which an individual has a certain age when it was mated. At the moment, certain characteristics which we are not aware of the evolution are fixed descriptors for an individual. These are: age, sex, parent info. All parent info will be stored under individual as we are not able to trace which are the parents of the individuals | | |
| **attribute\_name** | **type** | **definition** | **example** |
| individual\_pk | PK | PK of the individual | TRAIN001 |
| individual\_id | varchar(64) | An individual id for identifying subgroups | INDDAT1 |
| individual\_current\_stage | varchar(256) | The life stage if identified during the measurement stage. Specify if it is a egg, larvae, adult stage when individual is collected (life\_stage\_general\_initial) | adult |
| individual\_name | varchar(256) | a name provided to the specimen, this can be associated to a dataset reference | IND454 |
| individual\_sex | varchar(64) | Sex type of individual as indicated in the study. (sex) | female |
| individual\_type | varchar(64) | indicates if it is part of offspring generation or parent type. Used to controlled the parenthood relationships | parent |
| individual\_parentpk | ID | specification if the specimen has a related specimen in the collection, such as parent is known. If parent is unknown, then leave blank | TRAIND001 |
| individual\_parentid | ID | ID of parent as specified in a study | mom54 |
| parent\_size\_value | DECIMAL(8,2) | Current size of the individual when collected (parental\_size\_value) | 9.1 |
| parent\_size\_unit | varchar(64) | Standard unit of measurement for the size metric of the parent individual collected (parental\_size\_units) | millimeter |
| parent\_size\_type | varchar(64) | Type of size metric of the parent (parental\_size\_type) | Fresh body mass |
| parent\_age | INT | age of the parent (parental\_age) | 1 |
| parent\_unit\_age | varchar(64) | units used to define the age of the parent (parental\_age\_units) | year |
| parent\_sex | varchar(64) | Indicates the sex of the parent | female |
| description\_individual | TEXT | free description and remarks relevant to the individual as provided in the dataset |  |
| comment | TEXT | Any extra comments that are not mentioned in the study |  |
|  | | | |
| **Table Name** | contains | | |
| **Table Type** | Relation | | |
| **Definition** | The reference of the population to its individuals | | |
| **attribute\_name** | **type** | **definition** | **example** |
| population\_pk | PK | reference to population, **MANDATORY** | TRAPOP001 |
| individual\_pk | PK | reference to specimen. This ID is generated, **MANDATORY** | TRAIND001 |
|  | | | |
| **Table Name** | Functional\_trait | | |
| **Table Type** | Entity | | |
| **Definition** |  | | |
| **attribute\_name** | **type** | **definition** | **example** |
| trait\_pk | PK | PK of the sharetrait trait, **MANDATORY** | TRATRA001 |
| trait\_name | text | This will be a defined trait (trait\_name) | amount if energy expended per time unit |
| trait\_id | ID | name given to the trait | METRATE |
| trait\_type | varchar(64) | this will include Development, Fecundity, Respiration. There can be more | metabolic\_rate |
| trait\_condition | text | Functional expression used for defining the trait | Frequently measured as rate of oxygen uptake or rate of CO2 production. |
| trait\_parentid | ID | Tree id of functional trait | TRATRA002 |
| life\_gen\_stage\_initial | varchar(64) | Life stage term used for a state of phase that can be specific for trait (life\_general\_stage\_initial) | egg |
| life\_gen\_stage\_final | varchar(64) | End stage term if defined for a phase (life\_general\_stage\_final) | adult |
| trait\_definition | text | Full trait definition to explain the term of the trait | amount if energy expended per time unit |
| trait\_definition\_source | varchar(256) | Source (provide full name) of expert or citation for definition | wilco |
| trait\_unit | varchar(64) | Preferred standard unit for the trait | mLO2/h/ind |
| trait\_reference\_id | text | Reference id (possibly url) of the trait defined | author |
| trait\_reference\_db | varchar(64) | Name of the resource | Can be a book |
|  | | | |
| **Table Name** | Measure | | |
| **Table Type** | Relation | | |
| **Definition** | Quantitative sharetrait characteristic that is measured for an individual / population. Fix to this: any measurable or observable characteristic of an organism | | |
| **attribute\_name** | **type** | **definition** | **example** |
| measurement\_pk | PK | PK of the morphological trait, **MANDATORY** | TRAMEA001 |
| individual\_pk | PK | name given to the trait | TRAIND001 |
| trait\_pk | PK | this will be size, developmental stage, life stage | TRATRA001 |
| trait\_value | DECIMAL(5,2) | Measured value of the sharetrait trait (trait\_value) | 96 |
| trait\_type | varchar(64) | Generic measure check for trait name | fecundity |
| trait\_unit | varchar(64) | Unit of measurement used for the trait (trait\_unit) | offspring number |
| stage\_specific\_initial | varchar(256) | Specific initial stage (life\_stage\_specific\_initial) | Gosner stage 25 |
| stage\_specific\_final | varchar(256) | Specific final stage (life\_stage\_specific\_final) | Gosner stage 26 |
| measurement\_date | varchar(256) | Date of the measurement | 21 july 2023 |
| date\_iso | date | ISO date | 21-07-2023 |
| date\_describe | text | Description of the date |  |
| trait\_specifications | text | A comment regarding the trait specifications for the measurement condition |  |
|  | | | |
| **Table Name** | Structural\_trait | | |
| **Table Type** | Entity | | |
| **Definition** | A morphological characteristic of a physical entity | | |
| **attribute\_name** | **type** | **definition** | **example** |
| structuretrait\_pk | PK | PK of the morphological trait | TRASTR002 |
| structuretrait\_name | varchar(256) | this will be size, developmental stage, life stage | body size |
| structuretrait\_id | ID | name given to the trait | size |
| structure\_type | varchar(256) | this will be size, developmental stage, life stage (size\_type) | quantitative |
| structure\_partof | varchar(256) | Body part of measured morphological trait | cortex |
| structure\_parentid | varchar(64) | Label if trait is derived | TRASTR001 |
| structure\_definition | text | this will include Development, Fecundity, Respiration. There can be more | The height and mass of a body. It is often expressed as the ponderal index: body height divided by the cube root of body weight. |
| structure\_definitionsource | varchar(256) | Formula reference to calculate the trait | Oxford dict |
| trait\_recommended\_unit | varchar(64) | Recommended unit if exists | millimeter |
|  |  |  |  |
| **Table Name** | has\_structure | | |
| **Table Type** | join | | |
| **Definition** | Relation that joins a measurement to a structural specification | | |
| **Notes** |  | | |
| **attribute\_name** | **type** | **definition** | **example** |
| structuretrait\_pk | PK | Primary key of the association Trait Individual | TRASTR001 |
| measure\_pk | PK | FK reference to individual entity | TRAMEA001 |
| structure\_value | decimal(5,2) | Numerical value given to the trait measurement (size\_value) | 0.1886 |
| structure\_unit | varchar(64) | Standard unit used for the type of measurement (size\_unit) | milligram |
| structure\_type | varchar(64) | Specification for the structural measurement (size\_type) | dry body mass |
| structure\_specification | varchar(64) | Specification to check to which type of individual is the structure measurement | tadpole |
| structure\_part | varchar(256) | Part of morphological structure if defined | body |
| structure\_date | DATE | Date if known of when the measurement was taken | 21-02-2023 |

### Category Method

|  |  |  |  |
| --- | --- | --- | --- |
| **Category** | Method | | |
| **Definition** | The controlled conditions applied to individuals in order to measure specific trait | | |
|  | | | |
| **Table Name** | Condition | | |
| **Table Type** | Entity | | |
| **Definition** | Primary relevant information of the laboratory controlled condition prior to the trait measurement taken | | |
| **attribute\_name** | **type** | **definition** | **example** |
| condition\_pk | primary key | Primary Key of condition entity, **MANDATORY** | TRACON001 |
| condition\_name | varchar(256) | Name of the condition | Name of the condition |
| temperature\_value | decimal (8,2) | Temperature value of the condition (either test, maintenance and acclimation) | 10 |
| temperature\_unit | varchar(30) | Standard unit for the temperature measurement | celsius |
| … |  |  |  |
|  | | | |
| **Table Name** | experiment\_setup | | |
| **Table Type** | join | | |
| **Definition** | Relation of the condition to a measured trait | | |
| **attribute\_name** |  | **definition** | **example** |
| measurement\_pk | Primary key | PK of the measure, **MANDATORY** | TRAMEA001 |
| condition\_pk | PK | PK of the condition entity, **MANDATORY** | TRACON001 |
| contion\_label | varchar(256) | Condition is either test, maintenance, acclimation | test |
| setup\_date | date | ISO date when an experiment condition is setup | 06-06-2023 |
|  | | | |
| **Table Name** | Acclimation\_describe | | |
| **Table Type** | Relation | | |
| **Definition** | Association of a condition to acclimation specifications which are only relevant for condition=acclimation. | | |
| **Notes** | Extension of attributes for condition is acclimation | | |
| **attribute\_name** | **type** | **definition** | **example** |
| condition\_pk | PK | Reference to Condition entity (foreign key) | TRACON001 |
| acclimation\_pk | PK | Reference to Acclimation\_specification (foreign key) | TRAACC001 |
| specification\_date | date | ISO date linked to acclimation specification | 07-07-2023 |
|  | | | |
| **Table Name** | Acclimation\_specification | | |
| **Table Type** | Entity | | |
| **Definition** | Extension specifications for acclimation | | |
| **Notes** |  | | |
| **attribute\_name** | **type** | **definition** | **example** |
| acclimation\_pk | PK | Primary key of acclimation specifications | TRAACC001 |
| acclimation\_name | varchar(256) | Name of acclimation |  |
| acclimation\_chamber | varchar(256) | Provide acclimation time after transfer to respirometry chamber (chamber) | 1 |
| acclimation\_mating |  | Indicates whether mating was allowed or not during the acclimation period (mating) |  |
| fasting\_time |  | Provide duration of animal fasting before placement in respirometry chamber (fasting\_time) | 4 |
| fasting\_unit | varchar(30) | Standard unit of fasting time | hours |
|  | | | |
| **Table Name** | chamber\_describe | | |
| **Table Type** | join | | |
| **Definition** | Specifications regarding the chamber used for specific trait measurements | | |
| **Notes** |  | | |
| **attribute\_name** | **type** | **definition** | **example** |
| measurement\_pk | PK | Primary key of acclimation specifications | TRAMEA001 |
| technique\_pk | PK | Reference to technique\_pk (FK) | TRATEC001 |
| specification\_date | date | Specific date of chamber setup | 04-04-2024 |
|  | | | |
| **Table Name** | respiratory\_chamber | | |
| **Table Type** | entity | | |
| **Definition** | Chamber characteristics and setup used for certain trait measurements | | |
| **Notes** |  | | |
| **attribute\_name** | **type** | **definition** | **example** |
| technique\_pk | PK | Primary key of respiratory\_chamber | TRATEC001 |
| sensor\_type | varchar(30) | Sensor type used to measure the oxygen during the experiment (sensor\_type) | fiber optic-based oxygen analyzer |
| respiration\_volume | decimal | Volume of the empty respirometric chamber (respiration\_volume) | 5000 |
| delay\_time | varchar(256) | Provide wait (delay) time excluded from closed measurement cycles. Also referred as equilibration period. (delay\_time) | NA |
| respiratory\_chamber | text | Material of respirometer, (respiratory\_chamber\_material) | plastic |
| incubation\_time | decimal | Time spend in the respirometry chamber (incubation\_time) | 6 |
| respirometry\_type | text | Type of respirometry (respirometry\_type) | closed |
| breathing\_mode | text | Breathing mode based on the respiratory medium used in the experiment (breathing\_mode) | aquatic |