European Journal of Taxonomy

Material Citations Formatting Guide

INTRODUCTION

In accordance with the *European Journal of Taxonomy*'s FAIR Data & Open Science policy (available from https://europeanjournaloftaxonomy.eu/index.php/ejt/fairopenscience), the formatting guide for zoological and botanical material citations is presented below.

It is mandatory for authors to follow this format while preparing their manuscripts for submission. *EJT* requires authors to strictly adhere to the guidelines mentioned below, and manuscript not conforming to the requirements will be returned to the authors.

Only material data presented in the 'Material examined' sections of the manuscript will be tagged and converted for distribution. At this time, any material data presented in a separate table or section of the paper cannot be linked back to the specimen citation to form a full occurrence record.

Each citation is composed of diverse information about the material: number of individuals, locality, date collected, etc.

EJT identifies each piece of information using Darwin Core (DWC) terms. To efficiently perform this, **all the information must be consistently presented in the same order throughout the article, and obey some punctuation/format rules**.

The **repository data field** (at the end of each specimen citation) is particularly important to locate and identify the material for future use. Authors should pay much attention to this data field.

Most taxonomic manuscripts can be formatted according to the rules presented here. If necessary, the authors may contact the editorial office (ejteditorialoffice@gmail.com) for advice or feedback prior to submission.

N.B. Examples provided here are inspired from material published in *EJT*; however, some data have been removed or modified from these records, to present appropriate examples of format.

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A. ZOOLOGY

1. General presentation

1.1. Headers

For ***new taxa***, the material should be separated as

Type material
Holotype
Paratypes
Other material examined

For ***old taxa***, if applicable the type material is separated.

If not applicable, all material is cited as

Material examined

If the material is only cited, but was not examined, authors can add this information next to the header

Paratypes (not examined)

Or add this information inside the specimens citations

Paratypes
COUNTRY • 1 ♀; …… • 1 ♂ (not examined); ……. • 1 ♂, 3 ♀♀; …….

1.2. Material, specimen, individual, collection data: definitions in this Guide

A *material citation* is the whole information concerning a specific taxon inside the manuscript.

A *specimen citation* is an **individual** (e.g. a single holotype), or a **group of individuals** gathered as a "specimen" because they were collected together and share the exact same collection data. Each specimen citation may be identified under its unique specimen code (if available).

When several individuals do not share the exact same collection data, they should be split into different specimen citations.

An *individual* is a physically unique material, for example, a shell, a male individual, a juvenile, an egg, an illustration... In some disciplines, as the sex is unknown, the term "specimen" can eventually be used to name the individuals. See below in the Section "Individual count".

The *collection data* represents all the information related to a specimen at the time when it was collected (who? where? what? what time? how?), as well as information on where the specimen can be found (institution where it is stored, information to identify it – such as a specimen code).

1.3. Punctuation and order

For each taxon, the *material citation* is composed of one or several paragraphs. Each paragraph contains the material of one country. The country name is in capital letters.

Whenever possible, especially for long lists of material, organise the specimens according to the region.

The **specimens citations** are separated with a **bullet point •**

In Microsoft Word, the following keyboard shortcuts can be used to obtain a bullet point:
- Mac: Alt + 8 (QWERTY keyboard) / Alt + shift + full stop (AZERTY)
- Windows: Alt + 0149 on the numeric keypad

Within a specimen citation, each type of *collection data* is separated with a **semicolon ;**

...; locality; coordinates; elevation; date; .....

Inside a data field (e.g., locality), **use commas ,** and not semicolons to separate elements, e.g., for the locality field:

; area, park, mountain, canyon, gorge;

The order of the data is as follows:

COUNTRY • number and sex of individuals; locality; geographic coordinates; elevation/depth; collection date; collector name; other collection data; associated molecular data; repository and specimen code.

If the material is organised by region, the format is:

COUNTRY – **Region 1** • number and sex of individuals; locality; geographic coordinates; elevation/depth; collection date; collector name; other collection data; associated molecular data; repository and specimen code. – **Region 2** • number and sex of individuals; locality; geographic coordinates; etc.

[The first region after the country is introduced with a **n-dash** –, and the region name is followed by a bullet point •. The next regions within the same country are separated by a **full-stop + n-dash** . –, and the region name is again followed by a bullet point •]

2. Data fields

2.1. Country/ Water body

DarwinCore: countryCode (and for the region, stateProvince)

The citations must be listed by either country or water body (e.g., ocean/sea), using a separate paragraph for each new zone. The country or water body is presented in capital letters.

THAILAND • 1 ♂ adult; .....

If the material is organised by region, use the following format:

MAURITANIA – **off Banc d'Arguin** • 11 shells; 20.3667° N, 17.6667° W; depth 200 m; 28 Oct. 1978; CANCAP stn 3.120; sandy clay with shells; van Veen grab; SaM • 3 shells; 18.9833° N, 16.8333° W; depth 203 m; 30 Oct. 1978; CANCAP stn 3.140; sandy clay with shells; van Veen grab; RMNH, RMNH.MOL.351807 • 7 shells; Arguin mud wedge; 20.4569° N, 17.6795° W; depth 142 m; 24 Oct. 2010; MSM16–3 stn GeoB14706; box core in muddy silt; SaM • 1 shell; 19.94° N, 17.48° W; depth 151 m; 22 May 1988; Tyro Mauritania I stn B5; RMNH, RMNH.MOL.351808. – **off Nouakchott** • 1 shell; 17.0967° N, 16.73° W; depth 127 m; 17 Feb. 1977; M44 stn 193–KG626; box core; SMF • 3 shells; 17.045° N, 16.7783° W; depth 199 m; 11 Feb. 1977; M44 stn 133–KG616; box core; SMF. WESTERN SAHARA – **off Cap Blanc** • 22 shells; 21.325° N, 17.37° W; depth 81 m; 25 Feb. 1977; M44 stn 235–KG649; box core; SMF.

2.2. Individual count

DarwinCore: individualCount

This field may contain several details about the composition of the specimen cited:

- **number of individual(s)** (one, several)

Exception: for a holotype, no number is used (there is only one holotype)

Holotype CHINA – **Yunnan Province** • ♂; Tengchong City, Laifeng Mountain National Forest Park; 25°08′ N, 98°29′ E; 1796 m; 16 Jul. 2014; P.L. Wu leg.; MHBU, MHBU-ARA-1001. **Paratypes** CHINA – **Yunnan Province** • 1 ♂, 5 ♀♀; same collection data as for holotype; MHBU, MHBU-ARA-1002 • 1 ♀; Tengchong City, Jietou Township; 25°25′ N, 98°38′ E; 1602 m; 15 Jul. 2014; P.L. Wu leg.; MHBU, MHBU-ARA-1003.

- **sex**: ♀, ♂, ⚥

The symbol is doubled when more than one individual, keep a space between number and sex symbol(s):

1 ♂

2 ♀♀

3 ♂♂, 6 ♀♀

- **nature**: specimen, juvenile, worker, soldier, shell, exuviae... The following abbreviations are used

1 spec., 2 specs

1 juv., 2 juvs

- **type status**, e.g., if the specimen is the type of another species' name

- **other important information about the individual**, e.g. size, reference to an illustration...

MYANMAR • 1 shell, holotype of *P. ponsonbyi* (D = 17.8 mm); "Burmah", Hlindet; NHMUK 1913.3.14.9.

USA • colony of 40 zooids, one ovicellate, on rock; California, Trinidad Head North; 41°3′25.1928″ N, 124°9′4.1826″ W; 7 Feb. 2020; I.A. Chowdhury and H. Lee leg.; SBMNH 704788.

CAUTION: when you cite an individual/a group of individuals, all the subsequent data in the same specimen citation will apply to this individual/group!

In this example from South Africa, there are 6 individuals, but only 3 specimen citations:
1°) one male, collected on 8 Sep. 1995, deposited in NCA under the specimen code 95/394
2°) two females, collected on 3 Sep. 1995, deposited together in NCA under the specimen code 95/243
3°) three other males, collected on 8 May 1991, associated with termites, deposited together in NCA under the specimen code 91/1051.

SOUTH AFRICA • 1 ♂; Eastern Cape Province, Middelburg; 31°49′ S, 25°00′ E; 8 Sep. 1995; M. de Jager leg.; pit traps; NCA 95/394 • 2 ♀♀; same data as for preceding; 3 Sep. 1995; NCA 95/243 • 3 ♂♂; same data as for preceding; 8 May 1991; associated with termites; NCA 91/1051.

2.3. Locality

DarwinCore: locality

From the largest to the smallest, use commas to separate the information within a locality, and the geographical coordinates are not part of this locality field (see next section).

CHINA – **Yunnan Province** • 1 ♂; Tengchong City, Jietou Township, Shunhe Village; 25°24′ N; 98°38′ E; 1552 m; 16 Jul. 2014; P.L. Wu leg.; MHBU, MHBU-ARA-1004.

If you wish to translate the locality (e.g., language not widely used), place the locality between quotes "...", and use square brackets [...] for the translation:

MONTENEGRO • 1 ♂; "Popovo Höhle bei Njegus" [Popovo Cave near Njegus]; 30 May 1903; Sturany leg.; NHMW 38260a.

Whenever possible, organise your material by region.

If the locality is unknown, try at least to provide the country, and leave the locality field blank.

If the locality is unknown for several specimens, and the material is organised by regions, place all these specimens under a region "locality unknown" at the end of the country paragraph.

"Station" can be abbreviated as "stn". Station data can be placed either in the locality field, or in the other collection data field (see below).

2.4. Geographical coordinates

DarwinCore: decimalLatitude and decimalLongitude

Various formats are accepted:
- degrees minutes seconds: 40°26′46″ N, 79°58′56″ W
- degrees decimal minutes: 40°26.767′ N, 79°58.933′ W
- decimal degrees: 40.446° N, 79.982° W

But follow these rules for correct identification:
- latitude first, then longitude
- include the degree symbol (°), without space: 40°26′
- for minutes use primes ′ and for seconds use double primes ″
- include the direction (N/E/S/W), use a space between the last delimiter and the direction (46″ N)
- use a maximum of 5 decimals (40.446° N)
- latitude and longitude separated with a comma

CHINA – Yunnan Province • 1 ♂; Tengchong City, Jietou Township, Shunhe Village; 25°24′ N, 98°38′ E; 1552 m; 16 Jul. 2014; P.L. Wu leg.; MHBU, MHBU-ARA-1004.

2.5. Elevation/depth

DarwinCore: elevation and depth

Elevation

65 m a.s.l.
65 m
elev. 1500 m
elev. 1250 m a.s.l.

Use n-dash for ranges:

1400–1500 m

Do not use the terms “altitude” or “alt.”, as altitude refers to points above the surface of the Earth (e.g., altitude of an aircraft during flight).

Depth
Use the term “depth” to differentiate it from an elevation:

depth 599–640 m
depth 203 m

2.6. Collection date

DarwinCore: eventDate

Date when the specimen was collected:
- format: dd Mmm. YYYY
- days from 1 to 9: do not add zero in front
- month: first 3 letters abbreviated in English, followed by full-stop, except for May
- year always with 4 digits
- each element separated by a space

1 Sep. 2004
16 May 1993

Wrong formats: 12 Sept. 2004, 23 Fév. 2012, 08 Aug. 1947, 3.viii.1854, 17 Apr. 54.....

Date ranges should be shown with an n-dash, e.g.,

Jan.–May 2018
5 Feb.–6 Apr. 2016

14 Dec. 2008–3 Feb. 2009
1950–1953

2.7. Collector name

DarwinCore: recordedBy

The name(s) of the collector(s) should always be followed by "leg.", no space between initials:

P.L. Wu leg.

Use commas, and a last "and" to separate the collectors; if there are many collectors (e.g. more than 3), all collectors can be mentined, or "*et al.*" may be used

I.A. Chowdhury and H. Lee leg.

D. Kusy, M. Motyka and L. Bocak leg.

F. Limeira-de-Oliveira *et al.* leg.

For expeditions, "exped." can be used, e.g., "MNHN exped."

2.8. Other collection data

Other collection data is provided after the collector name. Examples of other data:
- trapping method
- research vessel, identification number for a dive, a station...
- host, habitat

BRAZIL – **Santa Catarina State** • 2 ♀♀, adults; Santo Amaro da Imperatriz, Plaza Caldas; 27°44′30″ S, 48°48′07″ W; 460 m a.s.l.; 31 Jan. 2013; A. Ambrozio-Assis leg.; frog-call trap (*Boana bischoffi*); CEMHS.

CHINA – **Yunnan Province** • 1 worker; Yulong County, Longpan Town, Xionggu Village; 26.86114° N, 100.02437° E; 2500 m a.s.l.; 21 Oct. 2004; Sheng-Li Shi leg.; *Pinus yunnanensis* forest; SWFU A04-1256.

COSTA RICA • 6 specs (ethanol); methane seep Jaco Scar; 9.118° N, 84.839° W; depth 1752–1802 m; 12 Jan. 2010; Elena Perez and Geoff Cook leg.; collected by HOV *Alvin*, Dive 4591; SIOBIC N266.

BRAZIL – **Maranhão** • 1 ♂; Mirador [sic, Formosa da Serra Negra] municipality, Parque Estadual do Mirador, Base da geraldina; [6°37′25″ S, 45°52′08″ W]; 20–23 Apr. 2007; F. Limeira-de-Oliveira leg. [00047]; C.L. Franco det. 2021; CZMA.

If there are different kinds of other collection data, they are separated with semicolons.

Type Material

Holotype

KENYA • ♂; Western Province, Kakamega Forest; 00°12′42.6 N, 34°55′52.3 E; 1615 m a.s.l.; 16 Aug. 2007; F. Hita Garcia leg.; Transect 20; primary rain forest; Winkler leaf litter extraction; ZFMK, ZFMKHYM-00037034.

Some abbreviations may be used, e.g.,

ROV: Remotely Operated Vehicle
HOV: Human Occupied Vehicle
RV: Research Vessel
stn: station
det.: determinavit (identified by)

2.9. Associated molecular data

Associated molecular data (e.g., sequences) should be identified as such, e.g., “GenBank no.: 5587453”, “GenBank nos: ON117610 (nrITS), ON229505 (nrLSU)”.

Use "no.” for one number, “nos” for several numbers, separate numbers with commas and add the marker between brackets, as shown below.

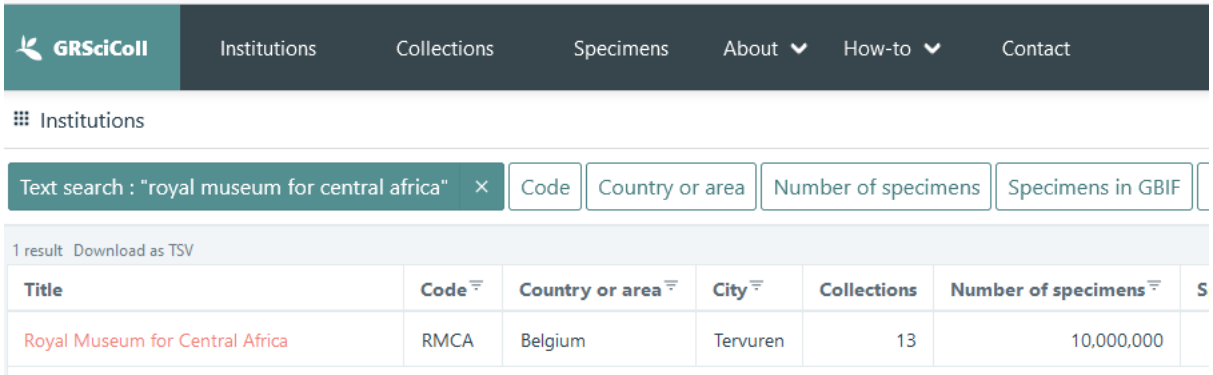
SPAIN • 1 ♀; W Mediterranean, Alboran Sea, Málaga, Marbella; depth 2–4 m; 24 Mar. 2021; García Raso leg.; from *Donax trunculus* Linnaeus, 1758 fisheries; GenBank nos: OR555891 (16S), OR557371 (COI); ICMAN, CRUST_ICMAN/3765.

2.10. Repository data

DarwinCore: institutionCode and catalogNumber

The repository data field is composed of two kinds of data:
- the repository (= acronym of the institution where the specimen is stored), e.g., ZFMK
- the specimen code (= a unique identifier within this institution, for example a code, a unique catalogue number), e.g., Kra55–56

For the acronym of the repository, check first if the institution is recorded in GRSciColl (https://scientific-collections.gbif.org/), and use the code available:



Between the repository and the specimen code, a space or a comma should be used, but keep consistency throughout the whole manuscript:

Manuscript using only spaces
ZFMK USA16
ZFMK Kra55–56
MNHN AR3112

Manuscript using only commas
RBINS, INV. 187220
ZRC, ZRC_ENT00007608

If the specimen code contains the repository acronym, repeat the repository acronym before the code:
RMCA BE_RMCA_ARA.Ara 155566 or

RMCA, BE_RMCA_ARA.Ara 155566

Regardless if they are available on GRSciColl or not, the acronyms of all repositories must be also listed and described in the section **Material and methods** of the manuscript:

Acronyms of repositories
RBINS = Royal Belgian Institute of Natural Sciences, Brussels, Belgium
RMCA = Royal Museum for Central Africa, Tervuren, Belgium
ZFMK = Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany

Whenever possible, split the material according to the specimen code associated with the individuals. For example, do not write

NAMIBIA • 2 ♂♂, 4 imm.; Grootfontein, Nosib Cave; 8 Feb. 1995; SEGL leg.; SAMC B7732, B8870.

but split the data:

NAMIBIA • 2 ♂♂; Grootfontein, Nosib Cave; 8 Feb. 1995; SEGL leg.; SAMC B7732 • 4 imm.; same data as for preceding; SAMC B8870.

In some case, the data may be difficult to split. If several specimen codes exist for the same specimen citation, do not use hyphens or n-dash to indicate a range, but use “to”

GREENLAND • 46 animals; same collection data as for the holotype; ISEA PAS, slides GL.001.01 to GL.001.03, SEM stub TAR.015.

THAILAND • 7 workers; same collection data as for holotype; THNHM, THNHM-I-21752 to THNHM-I-21758.

and use the full specimen code for each indication, not an abbreviated code:

THNHM-I-21752 to THNHM-I-21758

and not “THNHM-I-21752 to 21758”, or “THNHM-I-21752 to 58”

3. Specific cases

3.1. Missing data

In case of missing data (collector missing, no date...), do not add anything, just list the data available.

E.g., here no collector

ARGENTINA • 1 ♂; Neuquén, Añelo, Bajo Añelo from south of Route 7, on the way to Aguada Pichana; 38°14′57.87″ S, 68°56′37.38″ W; 321 m; 9 Mar. 2021; MPCN, MPCN-H-469.

3.2. Repetitive data

For repetitive data (e.g., same collector name, same locality), use “same data as for holotype”, or “same data as for preceding”, and always repeat the repository name (and specimen code if available) at the end of the citation.

Type material

Holotype

BRAZIL • Rocas Atoll; 3.8805091° S, 33.8780718° W; depth 1 m; 16 Oct. 2000; on coralline sand; MZUSP 6098.

Other material examined

BRAZIL • 135 specs; same data as for holotype; MNRJP.

For minor differences, use “same data as for holotype” or “same data as for preceding” and list the differences, using the same order as for other citations:

Type material

Holotype

THAILAND • ♀ adult; Chumphon Province, Muang District, Banna Subdistrict, Wat [= Temple] Tham Sanook and its cave Tham Sanook; 10.480° N, 99.073° E; 65 m a.s.l.; 24 Jul. 2022; P. Pawangkhanant, N.A. Poyarkov and C. Suwannapoom leg.; AUP-02036.

Other material examined

THAILAND • 1 ♂ adult; same data as for holotype; 27 Jul. 2022; ZMMU Re-17664 (field label NAP-11581) • 1 ♀ adult; same data as for holotype; 27 Jul. 2022; ZMMU Re-17666 (field label NAP-11582).

3.3. Verbatim data from label

As much as possible, collection data should be formatted and ordered as presented in the sections above, in order to prevent inaccurate data interpretation during the automated conversion process.

If labels contain data that cannot be standardised, authors may include photographs of the labels as figures. The full verbatim data can also be provided as a supplementary file, but should not be included in the manuscript. In the manuscript, at least minimal data should be provided:

COUNTRY • number of individuals; locality; collector; repository and specimen code.

Authors are aware that verbatim data may be interpreted by the machine without any guarantee of accuracy.

If authors wish to keep verbatim data in the material citation, the following conventions should be used:
- double quotation marks (“ ”) are used to include the whole verbatim label citation
- simple slashes / are used to separate lines on the same label, and double slashes // to separate different labels of the same specimen
- always repeat the repository name (and specimen code if available) at the end of the citation, after the quotation mark “;.

Two examples of data formatting:

Verbatim citation:

GABON • 1 spec.; “GABON / BAS-OGOOUÉ // COLLon LE MOULT / Naturaliste, Paris // COTYPE // *Acridoschema* / Favareli / Le Moult / P. Lepesme det. // Sammlung / P. Lepesme / Eing. Nr. 2, 1949 // ZMH 824657”; ZMH • 4 specs; “GABON / BAS-OGOOUÉ // COLLon LE MOULT / Naturaliste, Paris // COTYPE // Sammlung / P. Lepesme / Eing. Nr. 2, 1949 // [ZMH 824658-824661]”; ZMH.

Formatted citation:

GABON • 1 spec.; Bas-Ogooué; Le Moult leg.; “COTYPE // *Acridoschema* / Favareli / Le Moult / P. Lepesme det. // Sammlung / P. Lepesme / Eing. Nr. 2, 1949”; ZMH, ZMH 824657 • 4 specs; Bas-Ogooué; Le Moult leg.; “COTYPE // Sammlung / P. Lepesme / Eing. Nr. 2,”; ZMH, ZMH 824658 to ZMH 824661.

Verbatim citation:

BRAZIL – **Minas Gerais** • 1 ♀; “Brasil, MG, Francisco Dumont, Serra do Cabral; 17°34′05.2″ S, 4°19′28.3″ W; 1052m; 1.xii.2012; Em Flor; B.C. Figueredo UFMG IHY 1301564 / *Epicharis Epicharitides*) *cockerelli* (Friese, 1900) R.B. Martines, det. 2013”; DZMG.

Formatted citation:

BRAZIL – **Minas Gerais** • 1 ♀; MG, Francisco Dumont, Serra do Cabral; 17°34′05.2″ S, 4°19′28.3″ W; 1052 m; 1 Dec. 2012; B.C. Figueredo leg.; "Em Flor, B.C. Figueredo UFMG IHY 301564 / *Epicharis* (*Epicharitides*) *cockerelli* (Friese, 1900)"; "R.B. Martines, det. 2013"; DZMG.

3.4. Author interpretation

Authors may use square brackets [ ] to distinguish data that has been interpreted from a label e.g., coordinates interpreted from a locality, or translations of foreign text.

Authors should be aware that this data between square brackets may be interpreted by the machine as being the "true" collection data.

BRAZIL – **Maranhão** • 1 ♂; Mirador [sic, Formosa da Serra Negra] municipality, Parque Estadual do Mirador, Base da geraldina; [6°37′25″ S, 45°52′08″ W]; 20–23 Apr. 2007; F. Limeira-de-Oliveira leg. [00047]; C.L. Franco det. 2021; CZMA.

B. BOTANY

1. General presentation

1.1. Material, specimen, collection data: definitions in this Guide

A *material citation* is the whole information concerning a specific taxon inside the manuscript.

A *specimen citation* is the botanical material gathered as a "specimen" because it shares the exact same collection data. For example, several herbarium sheets may be recorded as a single specimen.

The *collection data* represents all the information related to a specimen at the time when it was collected (who? where? what? what time? how?), as well as information on where the specimen can be found (institution where it is stored, information to identify it – such as a specimen code).

When several physical materials do not share the exact same collection data, they should be split into different specimen citations.

1.2. Punctuation and order

For each taxon, the *material citation* is composed of one or several paragraphs. Each paragraph contains the material of one country. The country name is in capital letters.

Whenever possible, especially for long lists of material, organise the specimens according to the region.

The **specimens citations** are separated with a **bullet point •**

In Microsoft Word, the following keyboard shortcuts can be used to obtain a bullet point:
- Mac: Alt + 8 (QWERTY keyboard) / Alt + shift + full stop (AZERTY)
- Windows: Alt + 0149 on the numeric keypad

Within a specimen citation, each type of *collection data* is separated with a **semicolon** ;

...; locality; coordinates; elevation; date; .....

Inside a data field (e.g., locality), **use commas ,** and not semicolons to separate elements, e.g., for the locality field:

; area, park, mountain, canyon, gorge;

The order of the data is as follows:

COUNTRY • locality; geographic coordinates; elevation/depth; collection date; phenology; *collector name and collector number*; determinator; other collection data; associated molecular data; repository [specimen code(s)].

If the material is organised by region, the format is:

COUNTRY – **Region** • locality; geographic coordinates; elevation/depth; collection date; phenology; *collector name and collector number*; determinator; other collection data; associated molecular data; repository [specimen code(s)]. – **Region** • locality; geographic coordinates; etc.

[The first region after the country is introduced with a **n-dash** –, and the region name is followed by a bullet point •. The next regions within the same country are separated by a **full-stop + n-dash** . –, and the region name is again followed by a bullet point •]

2. Data fields

2.1. Country/ Water body

DarwinCore: countryCode (and for the region, stateProvince)

The citations must be listed by country (or water body for marine taxa), using a separate paragraph for each new zone. The country is presented in capital letters.

CAMEROON • Yaoundé; 3°52′ N, 11°31′ E;...

If the material is organised by region, use the following format:

DENMARK – **Lolland, Falster, Møn** • Ulvshale; 55°2.301′ N, 12°16.244′ E; 27 Apr. 2013; *JP 180*; JP det.; UB20; ZMUC [ZMUC C-F-122659]. – **Nordøstjylland** • Gammel Enge i Tofte Skov; 56°49.175′ N, 10°13.763′ E; 24 May 2005; *JP 108*; JP det.; NH79; ZMUC [ZMUC C-F-122585]. – **Sydjylland** • Lakolk; 55°8.325′ N, 8°29.618′ E; 31 May 2013; *JP 107*; JP det.; MG61; ZMUC [ZMUC C-F-122583].

2.2. Locality

DarwinCore: locality

From the largest to the smallest, use commas to separate the information within a locality, and the geographical coordinates are not part of this locality field (see next Section).

PAKISTAN • Punjab province, Rawalpindi district, Bhurban town; 33.9554° N, 73.4519° E; 1828 m a.s.l.; 7 Sep. 2020; *Annum Razzaq GB-18*; on soil below *Pinus*; GenBank nos: ON810645 (nrITS), ON810652 (LSU); LAH [37437].

If you wish to translate the locality (e.g., language not widely used), place the locality between quotes "...", and use square brackets [...] for the translation:

BRAZIL – **Minas Gerais** • Felício dos Santos, "APA Municipal Felício" [Municipal Environmental Protection Area Felício]; 10 Jun. 2006; fl, fr; *F.R.G. Salimena et al. 1382*; CESJ • Serro, "estrada Diamantina para o distrito de Milho Verde" [road from Diamantina to the Milho Verde district]; 16 Nov. 2010; fl, fr; *V. Thode, P. Lu-Irving, N. Mota, M. Toledo 386*; CESJ, ICN.

Whenever possible, organise your material by region.

If the locality is unknown, try at least to provide the country, and leave the locality field blank.

If the locality is unknown for several specimens, and the material is organised by regions, place all these specimens under a region "locality unknown" at the end of the country paragraph.

Type localities should be presented inside the type material citation. In certain cases, the type locality may be repeated under a separate header: see Section C.

2.3. Geographical coordinates

DarwinCore: decimalLatitude and decimalLongitude

Various formats are accepted:
- degrees minutes seconds: 40°26'46" N, 79°58'56" W
- degrees decimal minutes: 40°26.767' N, 79°58.933' W
- decimal degrees: 40.446° N, 79.982° W

But follow these rules for correct identification:
- latitude first, then longitude
- include the degree symbol (°), without space: 40°26'
- for minutes use primes ' and for seconds use double primes "
- include the direction (N/E/S/W), use a space between the last delimiter and the direction (46" N)
- use a maximum of 5 decimals (40.446° N)
- latitude and longitude separated with a comma

DENMARK – **Lolland, Falster, Møn** • Ulvshale; 55°2.301′ N, 12°16.244′ E; 27 Apr. 2013; *JP 180*; JP det.; UB20; ZMUC [ZMUC C-F-122659].

2.4. Elevation/depth

DarwinCore: elevation and depth

Elevation

65 m a.s.l.
65 m

Use n-dash for ranges:

1400–1500 m
elev. 1500 m
elev. 1250 m a.s.l.

Do not use the terms “altitude” or “alt.”, as altitude refers to points above the surface of the Earth (e.g., altitude of an aircraft during flight).

Depth

Use the term “depth” to differentiate it from an elevation:

depth 2 m
depth 20–60 cm

2.5. Collection date

DarwinCore: eventDate

Date when the specimen was collected:
- format: dd Mmm. YYYY
- days from 1 to 9: do not add zero in front
- month: first 3 letters abbreviated in English, followed by full-stop, except for May
- year always with 4 digits
- each element separated by a space

1 Sep. 2004
16 May 1993

Wrong formats: 12 Sept. 2004, 23 Fév. 2012, 08 Aug. 1947, 3.viii.1854, 17 Apr. 54.....

Date ranges should be shown with an n-dash, e.g.,

Jan.–May 2018
5 Feb.–6 Apr. 2016
14 Dec. 2008–3 Feb. 2009
1950–1953

2.6. Phenology

Use the following abbreviations:
fl: flower(s)
fr: fruit(s)
fl bud: flower bud(s)
st: sterile

If several phenological stages, use a comma (not semicolon ; and not slash /), e.g., fl, fr

BRAZIL – **Minas Gerais** • Felício dos Santos, "APA Municipal Felício" [Municipal Environmental Protection Area Felício]; 10 Jun. 2006; fl, fr; *F.R.G. Salimena et al. 1382*; CESJ.

2.7. Collector name and collector number

DarwinCore: recordedBy

The collector's name and field number are cited together in italics.

Use commas, and a last "&" to separate the collectors; if there are many collectors (e.g. more than 3), all collectors can be mentioned, or "*et al.*" may be used:

PERU – **Huancavelica Region: Prov. Huancavelica** • Motcca, 4 km SE de Conaica; [12°31′ S, 74°58′ W]; 3400–3500 m a.s.l.; Mar. 1951; *O. Tovar 250*; US [US00222334], USM • Yauli; [12°46′ S, 74°51′ W]; 3500 m a.s.l.; 11 Mar. 1939; *H.E. Stork & O.B. Horton 10871*; K. – **Puno Region: Prov. Carabaya** • Near Ollachea at km 216+700 on Carretera Transoceana, before tunnel Yana Negra, Accobamba; 13°52′33″ S, 70°30′51″ W; 3588 m a.s.l.; 11 Dec. 2017; *T. Sarkinen, S. Gamboa & W. Perez 5335*; E [E01007201].

BRAZIL – **Minas Gerais** • Felício dos Santos, "APA Municipal Felício" [Municipal Environmental Protection Area Felício]; 10 Jun. 2006; fl, fr; *F.R.G. Salimena et al. 1382*; CESJ.

Please note that only the collector name is harvested and placed in the data field recordedBy in the DarwinCore archive, and not the collector number.

2.8. Determinator

If desired, the person who identified formally the specimen (e.g., label on the herbarium sheet) may be cited, the name is followed by "det.", and eventually by the year:

C.L. Franco det. 2021

2.9. Other collection data

Other collection data is provided after the collector name and number/determinator. This may consist of habitat information, host, substrate, ecological data, geographical codes...

If there are different kinds of additional data, they are separated with semicolons.

CHINA • Guangdong province, Shaoguan City, Renhua County, Danxia mountain; 25°01′41.076″ N, 113°41′44.982″ E; elev. 150 m; in evergreen broad-leaved forest in a cave of Danxia landform; 12 May 2021; *Jian-Qiang Guo & Xin-Xin Zhou XKW675*; NF.

PAKISTAN • Azad Jammu and Kashmir, Muzaffarabad, Peer Chinasi; 34°23′ N, 73°32′ E; 2924 m; 9 Aug. 2018; *T. Saifullah & K. Habib PC-21*; on rocks; GenBank no.: MW508503; LAH [LAH-36674].

2.10. Associated molecular data

Associated molecular data (e.g., sequences) should be identified as such, e.g., "GenBank no.: 5587453", "GenBank nos: ON117610 (nrITS), ON229505 (nrLSU)".

Use "no." for one number, "nos" for several numbers, separate numbers with commas and add the marker between brackets, as shown below.

PAKISTAN • Azad Jammu and Kashmir, Muzaffarabad, Peer Chinasi; 34°23′ N, 73°32′ E; 2924 m; 9 Aug. 2018; *T. Saifullah & K. Habib PC-21*; on rocks; GenBank no.: MW508503; LAH [LAH-36674].

PAKISTAN – **Punjab Province** • Sheikhupura; 31°42′40″ N, 73°59′16″ E; 236 m a.s.l.; 3 Aug. 2017; *A. Izhar Skp102*; GenBank nos: ON117610 (nrITS), ON229505 (nrLSU); LAH [35709].

2.11. Repository data

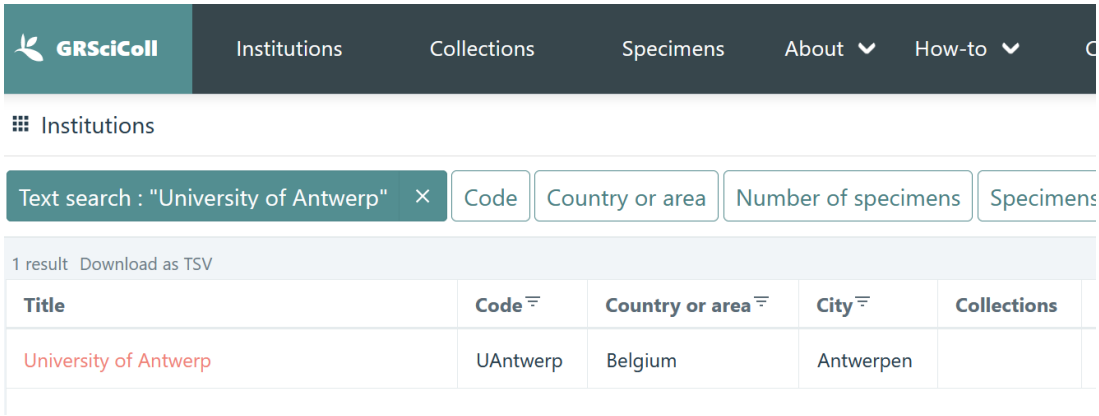
DarwinCore: institutionCode and catalogNumber

The repository data field is composed of two kinds of data:
- the repository (= acronym of the institution where the specimen is stored), e.g., P
- the specimen code (= a unique identifier within this institution, for example a barcode, a unique catalogue number), e.g., P00078874

Repository

Authors use acronyms of herbaria from Index Herbariorum (https://sweetgum.nybg.org/science/ih/) and a sentence is included in the Materials and methods section under the header Repositories. The Index Herbariorum website is listed in the bibliographic references of the manuscript.

If the institutions does not have a IH acronym, check first if the institution is recorded in GRSciColl (https://scientific-collections.gbif.org/), and use the code available:



If the institution does not have a GRSciColl acronym, use the standard English acronym from its official webpage.

Define all the acronyms that are not coming from Index Herbariorum in the Material and methods section:

Material and methods

Repositories

Acronyms of herbaria follow Index Herbariorum (2024), except for the following repository:

UAntwerp = University of Antwerp, Belgium

References

Index Herbariorum 2024. Index Herbariorum: a global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium.Available from https://sweetgum.nybg.org/science/ih/ [accessed 30 Apr. 2024].

Pattern

Acronym of the repository + space + [specimen code between square brackets]

If the acronym of the repository is also included in the specimen code, it should be anyway repeated in full, e.g.,

PERU – **Huancavelica Region: Prov. Huancavelica** • Motcca, 4 km SE de Conaica; [12°31′ S, 74°58′ W]; 3400–3500 m a.s.l.; Mar. 1951; *O. Tovar 250*; US [US00222334].

If the acronym of the repository is not included in the specimen code, do not repeat it:

PERU – **Huánuco Region** • Yanano; [9°51′ S, 75°49′ W]; ca 1828 m a.s.l.; 13–16 May 1923; *J.F. McBride 3721*; holotype: F [V0360598F].

3. Specific cases

3.1. Missing data

In case of missing data (collector missing, no date...), All commonly used abbreviations can be used where appropriate ("s.n."/ "s.loc."/ "s.d.", "s.coll" etc.).

COMORO ISLANDS – **Anjouan** • face NW du mont Tingui, village Hambo, canton Ouani; 10 Mar. 1957; fr; *s.coll. 16655-SF*; P • s.loc.; s.d.; fl; *Lavanchie 22*; P.

3.2. Repetitive data

For repetitive data (e.g., same collector name, same locality), use "same data as for holotype", "same data as for preceding", and always repeat the repository name (and specimen code if available) at the end of the citation.

Avoid "ibid." for the same locality, use "same data as for preceding":

PAKISTAN – **Punjab Province** • Sheikhupura; 31°42′40″ N, 73°59′16″ E; 236 m a.s.l.; 20 Jul. 2018; *A. Izhar Skp106*; GenBank no.: ON229117 (nrITS); LAH [37112] • same data as for preceding; 12 Aug. 2021; *A. Izhar Skp107*; GenBank no.: ON229118 (nrITS); LAH [37113].

3.3. Verbatim data from label

As much as possible, collection data should be interpreted by authors and formatted according to the order and format presented above, in order to prevent inaccurate data interpretation during the automated conversion process.

If labels contain data that cannot be standardised, authors may include photographs of the labels as figures. The full verbatim data can also be provided as a supplementary file, but should not be included in the manuscript. In the manuscript, at least minimal data should be provided:

COUNTRY • locality; collector and collector number; repository and specimen code (if available).

3.4. Author interpretation

Authors may use square brackets [ ] to distinguish data that has been interpreted from a label e.g., coordinates interpreted from a locality, or translations of foreign text.

Authors should be aware that this data between square brackets may be interpreted by the machine as being the "true" collection data.

NEW CALEDONIA • North Province, Bopope, southern slope of Mount "Kantalupaik" [Katalupaik]; 20°50′28″ S, 165°0′38″ E; 500 m; 29 Oct. 2017; fl.; *D. Bruy, J. Munzinger, & M. Pignal 1139*; K, MO, MPU [MPU311450, MPU312887], NOU [NOU090952], P [P01073272].

4. Headers and presentation

As the type material can be quite complex in botany, the format provided below is required.

4.1. New taxa without synonyms

Divide the type material (containing holotype and isotype(s)) from the other material examined.

Begonia condorensis Jara & Moonlight sp. nov.
Figs 20, 21A

Diagnosis

...

Etymology

...

Type material

PERU – **Cajamarca Region: Prov. San Ignacio** • Dist. Huarango, Cordillera Huarango (prolongación al sur de la Cordillera del Cóndor), Sector El Romerillo; 5°16′17″ S, 78°40′13″ W; 2060 m a.s.l.; 24 Apr. 2006; *E. Rodríguez, S. Orroyo, J. Nuñez & L. Campos 2996*; holotype: HUT [HUT44721]; isotypes: HUT [HUT44721], MO [MO-2194463], US [US00951218], QCNE [QCNE0220802].

Other material examined

ECUADOR – **Prov. Santiago-Zamora** • Dist. Palanda, Región de la Cordillera del Cóndor, sector Sur, Parroquia San Francisco de Vergel, Margen izqueirdo del río Vergel, pantano; 4°43′01″ S, 78°57′47″ W; 1800 m a.s.l.; 13 Mar. 2005; *W. Quizhpe, B. Medina, C. Aguirre & M. Prado 1013*; HUT [HUT45696], MO [MO-2135430].

PERU – **Cajamarca Region: Prov. San Ignacio** • Dist. Huarango, Nuevo Mundo, Caserío Pisaguas, a 2 horas del poblado y al norte, margen derecha quebrada Santa Rosa; 5°10′ S, 78°32′ W; 1700 m a.s.l.; *E. Rodríguez R. 1900*; HUT, MO [MO-1100939], US [US00843967] • Dist. Huarango, Cordillera Huarango (El Romerillo), Base cordillera en el lado oriental; 5°16′17.1″ S, 78°40′13.5″ W; 2062 m a.s.l.; *S. Arroyo A. & E. Rodríguez R. 171*; HUT.

4.2. Old taxa without synonyms

Add the protologue, eventually a revised diagnosis and the etymology, and then cite the material (also divided):

Begonia heliantha Tebbitt
Figs 16, 17A

Begonia heliantha Tebbitt (Tebbitt 2016: 145).

[**Diagnosis** ...]

[**Etymology** ...]

Type material

PERU – **Puno Region: Prov. Sandia** • Entre Sandia y Tambopata; 1700–2200 m a.s.l.; [14°15′ S, 69°25′ W]; 7 Aug. 1965; *J.C. Vargas Calderón 16417*[a]; holotype: US [US01269467]; isotype: CUZ.

Other material examined

PERU – **Puno Region: Prov. Sandia** • ca 17 km on road below Sandia; 14°13.684′ S, 69°24.736′ W; ca 1600 m a.s.l.; 16 Feb. 2002; *R.T. Pennington, T.D. Pennington & A. Daza 1113*; E [E00274868], K, MOL.

4.3. Taxa with synonyms

When the synonyms share the same type material as the taxon, use this presentation:
- protologue of the taxon
- homotypic synonyms (sharing the same type as the taxon) as a single paragraph with the protologue, use n-dashes to separate the synonyms
- heterotypic synonyms (with another type than the taxon itself) with their protologues and their types, each on a separate paragraph:

Begonia ulmifolia Willd.
Figs 40, 41

Begonia ulmifolia Willd. (Willdenow 1805: 418). – *Donaldia ulmifolia* (Willd.) Klotzsch (Klotzsch 1854: 127).

Begonia dasycarpa A.DC. (de Candolle 1859: 127). – **Type**: BRAZIL – **Bahia State** • 1851; *L. Dupasquier s.n.*; lectotype: G-DC [F neg. 7324], **designated here**.

Begonia gesnerioides L.B.Sm. & B.G.Schub. (Smith & Schubert 1941a: 190). – **Type**: PERU – **San Martín Region** • Juanjuí, Alto río Huallaga; [7°11′ S, 76°46′ W]; 400–800 m a.s.l.; Apr. 1936; *G. Klug 4296*; holotype: GH [GH00068236]; isotypes: BM [BM000832011], F [V0042321F], K [K001089509], MO [MO-2264384], NY [NY03091036], P [P05586479], S [S04-727], U [U0000718], UC [UC709875], US [US00115323]. **Syn. nov.**

Begonia jairi Brade (Brade 1950: 135). – **Type**: BRAZIL – **Espírito Santo State** • Estrada de Ferro Vitória-Minas Gerais, entre Boa Vista e Estação Pedro Palácio; J. *Vieira & J. Mendoça 44*; holotype: RB [RB00536704, RB00538019]; isotypes: HB.

[**Diagnosis**...]

[**Etymology**...]

Type material

VENEZUELA • Caracas, La Venta, "In America meridionali"; *F.W.H.A. von Humboldt 690*; lectotype: B [BW17571020, BW17571010], designated by Smith (1973: 217); isolectotypes: P [P01900835, P00679511].

Other material examined

PERU – **San Martín Region: Prov. Huallaga** • Cascadas de Shima, ca 45 minute walk towards waterfall from trail mouth; 6°53′56″ S, 76°50′07″ W; 521 m a.s.l.; 5 Feb. 2016; *P.W. Moonlight & A. Daza 183*; MOL, E [E00885871] • same data as for preceding; 6°53′57″ S, 76°50′02″ W; 466 m a.s.l.; 5 Feb. 2016; *P.W. Moonlight & A. Daza 184*; MOL, E [E00885870].

4.4. Complex synonymy, lectotypifications, new synonyms

Synonyms sharing the same type are grouped and ordered (from oldest to newest).

Lectotypifictations are indicated with "**designated here**"

New synonyms are indicated with "**syn. nov.**"

Begonia hirta (Klotzsch) L.B.Sm. & B.G.Schub.
Figs 21A, 22

Begonia hirta (Klotzsch) L.B.Sm. & B.G.Schub. (Smith & Schubert 1941a: 197). – *Casparya hirta* Klotzsch (Klotzsch 1855: 247). – *Casparya cordifolia* var. *hirta* (Klotzsch) A.DC. (de Candolle 1864: 273).

Casparya columnaris Klotzsch (Klotzsch 1855: 247). – **Type**: PERU – **[Huánuco Region: Prov. Huánuco]** • in Muña; [9°40′ S, 75°49′ W]; *H. Ruiz s.n.*; lectotype: B [F neg. 20853], **designated here**; isolectotype: HAL ex B [HAL0121732].

Casparya grewiifolia var. *pavoniana* A.DC. (de Candolle 1864: 272). – **Type**: PERU • [Peru]; 1777–1788; *J.A. s.n.*; lectotype: G-BOIS ex B ex herb. Lamberti, **designated here**. **Syn. nov.**

Casparya cordifolia A.DC. (de Candolle 1864: 273). – *Begonia cordifolia* (A.DC.) Warb., nom. illeg.; later homonym non (Wight) Thwaites) (Warburg 1894: 146). – *Begonia hirta* var. *cordifolia* (A.DC.) L.B.Sm. & B.G. Schub. (Smith & Schubert 1941a: 192). – **Type**: PERU • *J.A. Pavón s.n.*; lectotype: G-BOIS, **designated here** • *J.A. Pavón s.n.*; syntype: G-DC ex G-BOIS [F neg. 7315] • 1777–1788; *H. Ruiz L. s.n.*; syntype: B [F neg. 20853] • 1777–1788; *H. Ruiz L. s.n.*; syntype: HAL ex B ex herb. Lamberti [HAL0121732] • 1777–1788; *H. Ruiz L. s.n.*; syntype: B [F neg. 20854]. **Syn. nov.**

Begonia raimondii Irmsch. (Irmscher 1949: 629). – **Type**: PERU – **Junín Region: Prov. Jauja** • Valle del río Masamerich, entre Costambos Atac y Calabaza; [11°32′ S, 74°48′ W]; 3100 m a.s.l.; 23 Apr. 1913; *A. Weberbauer 6639*; lectotype: US [US00115437], **designated here**; isolectotypes: B, MOL [MOL00003002, MOL0003003, MOL0003004], US [US00222277] • Entre Santiago y Llalla; *A. Raimondi 2982*; syntype: B [n.v.].

[**Diagnosis**...]

[**Etymology**...]

Type material

PERU – **[Huánuco Region: Prov. Huánuco]** • in Muña; [9°40′ S, 75°49′ W]; 1784; *H. Ruiz s.n.*; lectotype: B [B101068571, F neg. 20854], **designated here**.

Other material examined

...

4.5. New combination

Cite the full protologue with place of publication (book, journal...) and page number:

Bergera glabra (Guillemin) F.J.Mou comb. nov.
Fig. 6

Basionym: *Micromelum glabrum* Guillemin, *Notulae systematicae (Paris)* 1: 216 (Guillemin 1910).

Chalcas glabra (Guillemin) Tanaka (Tanaka 1928: 711). – *Murraya glabra* (Guillemin) Swingle (Swingle 1938: 532).

Etymology

The specific epithet refers to the glabrous leaves.

Type material

VIETNAM • Tonkin, Kien-khé; *H. Bon 2977*; lectotype: P [MNHN-P-P05186001], designated by Tanaka (1928); isolectotypes: P [MNHN-P-P05186003, MNHN-P-P05186004].

Other material examined

VIETNAM • 14 Jun. 1920; *M.E. Poilane 1590*; P • 31 May 1924; *M.E. Poilane 10685*; P • same data as preceding; *M.E. Poilane 10689*; P • 2 Jul. 1924; *M.E. Poilane 11099*; P • Đà Nẵng, Liên Chiêu près Tourane; 17 Aug. 1923; *M.E. Poilane 7596*; P • same data as preceding; *M.E. Poilane 7602*; P • Quảng Trị, Col d'Ailao pro; 2 Aug. 1933; *M.E. Poilane 22820*; P.

4.6. Previous lectotype designations

Type material

PERU – **Pasco Region: Prov. Oxapampa** • Pozuzo; [10°04′ S, 75°33′ W]; *R. Pearce 556*; lectotype: K [K000536718], designated by Moonlight & Reynel (2018: 122).

Type material

VIETNAM • Tonkin, Kien-khé; *H. Bon 2977*; lectotype: P [MNHN-P-P05186001], designated by Tanaka (1928); isolectotypes: P [MNHN-P-P05186003, MNHN-P-P05186004].

C. SPECIFIC TAXA GROUPS OR DISCIPLINES (palaeontology, diatoms…)

Authors working on specific taxa groups or disciplines may encounter difficulties to adapt their material data to the format presented above. However, minimal data should be presented in the material citation.

COUNTRY • locality; collector (and collector number, if available); repository (and specimen code if available).

If necessary, the authors may contact the editorial office (ejteditorialoffice@gmail.com) for advice or feedback prior to submission.

Type locality

For palaeontology and papers on diatoms, whenever possible the type locality must be included in the main type material citation, and authors should respect the standard order and the semicolons: (1) locality; (2) coordinates; (3) elevation/depth.

The type locality information may also be repeated under a header "Type locality", in which the data may be re-arranged freely, using commas instead of semicolons.

Type

Holotype

ALBANIA • ♀; 1- Mat district, Shkëmb i Skanderbeut, gorge of Lumi i Varoshit; 41.6465° N, 20.1901° E; 970 m a.s.l.; Barina, Fehér, Murányi, Pifkó and Ujvári leg.; May 2010; HNHM, HNHM99656a/1.

Paratypes

ALBANIA • 2 ♀♀; same collection data as for holotype; HNHM, HNHM99656b/2 • 1 ♂; same collection data as for holotype; HNHM, HNHM99656b/3.

Type locality

ALBANIA • 1- Mat district, Shkëmb i Skanderbeut, gorge of Lumi i Varoshit; 970 m a.s.l.; 41.6465° N, 20.1901° E.

Complex type information

If the type material is complex, minimal data should be included in the Type material, including the repository and specimen code (if available); a free-text description of the holotype may be provided, and other important information may be depicted in other sections of the taxonomic treatment.

Type material

Holotype

RUSSIA • Solikamsk town, water-body in the Usolka River flood plain; 59°38′59″ N, 56°44′57″ E; 2014; collected by N.A. Martynenko; strain UR168; GenBank nos: MN509781, MN509779; MHA [*Cryptomonas uralensis* Russia Martynenko 20-2 MHA, strain UR168].

The holotype is a large drop of unfixed dried cells of the strain UR168 (=IPPAS H-2046) on water colour paper (hic designatus), deposited at MHA (Herbarium, Main Botanical Garden, Botanicheskaya Str. 4, Moscow, 127276, Russia) under the designation Cryptomonas uralensis Russia Martynenko 20-2 MHA, strain UR168. Representative living strain and DNA sample are kept at IPPAS.

Representative DNA sequences

GenBank accession numbers MN509781 (nuclear ITS2 and partial nuclear LSU rDNA), and MN509779 (nuclear SSU rDNA).

Authentic strain

UR168 (=IPPAS H-2046).

Type locality

A water-body in the Usolka River flood plain, Solikamsk town, Russia. Latitude/Longitude 59°38′59″ N, 56°44′57″ E, collected by N.A. Martynenko in 2014.

Other representative culture

UR167, GenBank accession numbers MN509780 (nuclear ITS2 and partial nuclear LSU rDNA), and MN509778 (nuclear SSU rDNA).