



## *European Journal of Taxonomy:* Material Citations Formatting Guide

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 specimen citations is presented below. Authors are encouraged to prepare their manuscripts according to this model prior to submission, but they will also be given an opportunity to comply upon acceptance of the article.

While *EJT* strongly recommends that authors adhere to the guidelines given below, the fine-grain formatting of the material citations is not compulsory; if an author decides not to comply or that the material is not appropriate, *EJT* will perform reduced formatting during production. In this case, the majority of the specimen data will not be tagged and converted into a machine-readable format; this means that the specimen-related information from the paper will not be included in major databases.

Only specimen data presented in the 'Materials examined' section will be tagged and converted for distribution. At this time, any specimen 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.

### **General presentation**

#### **1. Order**

Each material citation is composed of diverse data fields (number of specimens, locality, date collected, etc.) that *EJT* identifies using Darwin Core (DWC) terms. To efficiently perform this, it is important to ensure that the different fields of a material citation are consistently presented in the same order throughout the article or, at the very least, within a taxon treatment.

The preferred order for data fields differs for zoology and botany, and are as follows:

#### **Zoology**

**COUNTRY • specimen(s)** (e.g., "1 ♂"); **geographic / locality data** (from largest to smallest); **geographic coordinates**; **altitude / elevation / depth** (using alt. / elev. / m a.s.l. etc.); **date** (format: dd Mmm. YYYY, e.g., "16 Jan. 1998"); **collector** (followed by "leg."); **other collecting data** (e.g., micro habitat / host / method of collecting / "DNA voucher specimen" / "vial with detached elements", etc.); **barcodes/identifiers** (e.g., "GenBank: MG779236"); **institution code and specimen code** (e.g., "CBF 06023").

#### **Botany**

**COUNTRY • locality data** (from least to most specific); **geographic coordinates**; **altitude / elevation / depth** (using alt. / elev. / m a.s.l. etc.); **other collecting data** (e.g., habitat / substrate / method of collecting / "herbarium specimen" / "DNA voucher specimen"); **date** (format: dd Mmm. YYYY, e.g., "16 Jan. 1998"); **phenology** (e.g., fl / fr); **collection number** (*collector's name + number in italics*); **determinator** (followed by "det."); **repository[identifier in the repository]** (format: herbarium acronym[identifier]; e.g., "NY[133679], NY[3774223], NY[3774224], L[L.1264510]!, PLP[PLP-0012346], BR[AWH10018408]); **genetic identifiers** (e.g., "GenBank no.: MG779236").

Details on how to format each data field are provided in the 'Data fields' section.

## 2. Punctuation

A bullet point “•” (unicode: hex 2022, decimal 8226) is used to signify the beginning of a material citation. In Microsoft Word, the following keyboard shortcuts can be used to obtain a bullet point:

- for **Mac**: Alt + 8 (QWERTY keyboard) / Alt + shift + full stop (AZERTY)
- for **Windows**: Alt + 0149 on the numeric keypad

Within a citation, a **semicolon** “;” delimits each different field. Semicolons should not be used elsewhere in a material citation.

A single field can be composed of several details, which are separated by commas (e.g., the details region, area and town for the ‘locality’ field). In the following example, the ‘locality’ field is composed of two details: Province (“Eastern Cape Province”) and town (“Cradock”):

SOUTH AFRICA • ♂; Eastern Cape Province, Cradock; 30°19' S, 25°39' E; Aug.–Oct. 1985; museum staff leg.; pitfall trap; NMBA 1170.

## 3. Type material

### Zoology

Type material should be presented in separate paragraphs with relevant subheadings (Holotype, Paratypes, etc.).

### Botany

#### BASIONYMS & SYNONYMS

In botanical articles, the type material of basionyms and homotypic synonyms is presented in the same paragraph as the relative scientific name and bibliographic reference (just under the treatment heading), preceded by the mention “**Type:**” in bold. All heterotypic synonyms under the recognised name are cited accordingly with their basionyms.

*Ohelopapa flexilis* (Setch.) F.Rousseau, Martin-Lescanne, Payri & L.Le Gall comb. nov.  
Fig. 3, Table 2

#### Basionym

*Laurencia flexilis* Setch., *University of California Publications in Botany* 12: 101, pl. 19, figs 1–6 (Setchell 1926). **Type:** FRANCE • French Polynesia, Tahiti; reef at Tahara Mountain; *Setchell W.A., Setchell C.B. & Parks H.E. 5246*; holotype: JEPS[UC261333]. Original material is also preserved in SAP *fide* Masuda et al. (1999, 2006).

*Afroriccardia comosa* (Steph.) Reeb & Gradst. comb. nov.  
Figs 3–4

*Aneura comosa* Steph., *Botanical Gazette* 15 (11): 281 (Stephani 1890). – *Riccardia comosa* (Steph.) E.W Jones, *Transactions of the British Bryological Society* 3: 74 (Jones 1956, nom. inval.). – **Type:** FRANCE • La Réunion; 1889; *Rodriguez s.n.*; holotype: G[G00045027]!; isotype: PC[PC0103522]!

This presentation should be used regardless of whether the specimen has been examined (indicated by an exclamation mark in this context) or not.

#### LECTOTYPIFICATION

Example of material designated as lectotype in a previous publication vs material designated within the paper:

***Begonia acetosella*** Craib  
Figs 6–7

*Bulletin of Miscellaneous Information, Kew* 1912: 153 (Craib 1912). – **Type:** THAILAND • Chiangmai, Doi Sootep; 21 Mar. 1909; 18°50' N, 98°54' E; *A.F.G. Kerr* 557; lectotype: K[K000761199], designated by Tebbit 2003a, sheet 2 K[K000761201]; isolectotype: B.

*Begonia tetragona* Irmsch., *Mitteilungen aus dem Institut für allgemeine Botanik in Hamburg* 10: 515 (Irmscher 1939). – **Type:** CHINA • Yunnan, Mengtze; *Henry* 10737A; lectotype: B[B100238046], **here designated**; isolectotype: E[E00315022].

#### NEW TAXA

Type material for new taxa, which do not have an existing bibliographic reference (e.g., it is proposed for the first time in the publication), should be presented as follows, under the heading “Type” or “Type material”:

**Type**

PERU • Region Pasco, Prov. Oxapampa, Dist. Palcazu, Parque Nacional Yanachaga-Chemillén, sector Paujil; 150 m from entrance to Las Cavernas on trail from Paujil; 10°20'40" S, 75°15'1" W; alt. 432 m; 25 Feb. 2016; *Moonlight & Daza* 318; holotype: MOL; isotypes: E, MO, USM.

#### 4. Repetitive data

Repetitive data can be indicated with terms such as “same data as for holotype”, “same data as for preceding”, “same locality”, “ibid.”, etc., as long as the method used is consistent throughout the paper.

**Paratypes**

SOUTH AFRICA • 1 ♂; same data as for holotype • 1 ♀; Limpopo Province, “Pietersburg” [now Polokwane]; 23°54' S, 27°23' E; 4 Nov. 1916; C.A. Thompson leg.; TM 13375 (formerly 2217).

If a material citation is identical to another with only minor differences, the exceptions should be listed after the mention of repeated data e.g.:

**Zoology**

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 • 1 ♂; same collection data as for preceding; 3 Sep. 1995; NCA 95/243 • 2 ♂♂; same collection data as for preceding; 8 May 1999; associated with termites; NCA 91/1051.

**Botany**

INDIA – **Arunachal-Pradesh** • Dirang Dzong; 8 Aug. 1938; *Ward* 14055; BM • Senge Dzong; 18 Aug. 1938; *Ward* 14091; BM. – **Mizoram** • Hmuifang; Jul. 1926; *Parry* 45 • ibid.; Jul. 1926; *Parry* 46; K • ibid.; Jul. 1926; *Parry* 47; K • Lungleh; 1 Sep. 1931; *Wenger* 320; K.

## 5. ‘Missing’ elements

### Zoology

It is not necessary to include information such as “no date” or “no locality data”; list only the elements that are available.

### Botany

All commonly used abbreviations can be used where appropriate (“s.n.”/ “s.loc.”/ “s.d.”, “s.coll” etc.).

#### Type

IVORY COAST • Régio du Bas-Sassandra, Km 41 Sassandra-San Pedro road; 16 Nov. 1968; fl. bud, fr.; *Breteler 6052*; holotype: WAG; isotype: BR, K, MO n.v., PRE n.v., W n.v.

#### Basionym

*Laurencia crustiformans* McDermaid, *Phycologia* 28: 352, figs 2–8 (McDermaid 1989). **Type:** USA • Hawaii, Oahu, Lualualei Beach Park; 3 Jul. 1988; *K.J. McDermaid s.n.*; holotype: BISH[KM 2050] (Abbott 1999: 384).

## 6. Label citations

**Double quotation marks** (“ ”) are used to represent label citations that cannot be reliably interpreted and formatted as recommended in these guidelines. This data will simply be parsed as a verbatim citation. *EJT* recommends including photos of labels as figures if they contain data that cannot be standardised.

Only quotation marks should be used to present verbatim label data and they should not appear elsewhere in a material citation.

## 7. Author interpretation

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:

#### Lectotype (here designated)

MONTENEGRO • 1 specimen; “Popovo Höhle bei Njegus” [Popovo Cave near Njegus]; [43.5291° N, 19.2074° E]; 30 May 1903; Sturany leg.; NHMW 38260a.

## Data fields

The different data fields of a material citation that *EJT* identifies for conversion and diffusion are explained below, along with the format required to achieve maximum output and accuracy.

### 1. Country/ Water body

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.

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

MADAGASCAR – **Mahajanga Province** • Betsiboka Region, forêt de Kasijy, Kelifely; Nov. 1974; fl; *Morat 4700*; P, TAN • Boeny Region, Majunga; 30 Mar. 1912; fr; *Afzelius 259*; P • Soalala, Réserve Naturelle Intégrale de Namoroka, ca 40 km S of Soalala; 3 Feb. 2000; fr; *Davis, Rakotonasolo & Wilkin 2529*; BR, K, TAN • Majunga; dunes; Feb. 1915; fl, fr; *Perrier de la Bâthie 3504*; P • Ambongo; 17 Feb. 1841; fr; *Pervillé 680*; P.

CHINA – **Guangdong Province** • 1 ♀; Tianma, Xinhui; 24 Apr. 1956; Z.B. Zhou leg.; SCAU • 4 ♀♀; Xinhui; Nov. 1956; SCAU • 1 ♀; Nanhai; 14 Oct. 1955; L.B. Huo leg.; SCAU. – **Guangxi Province** • 1 ♂; Longsheng; 6 Apr. 1974; Y.L. Luo leg.; SCAU • 1 ♂; Huaan; 26 Apr. 1982; Y.Q. Tang leg.; SCAU. – **Hainan Province** • 1 ♂, 3 ♀♀; Diaoluoshan; Jul. 1995; Z.Q. Peng leg.; SCAU • 1 ♂; Diaoluoshan; 8 May 2005; X.M. Wang leg.; SCAU • 1 ♂; Dongfang; 27 Nov. 1997; Z.Q. Peng leg.; SCAU.

### 2. Specimen count (zoology)

This field can contain several indications about the specimen(s) cited: **number**, **nature** (e.g., specimen, juv., shell, exuviae), **sex** and **type status**. All subsequent data in the same citation will be applied to the specimen(s) presented.

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 collection data as for preceding; 3 Sep. 1995; NCA 95/243 • 3 ♂♂; same collection data as for preceding; 8 May 1991; associated with termites; NCA 91/1051.

THAILAND • 3 shells, same data as for preceding; HNHM 97479 • 16 specimens (preserved in ethanol); same data as for preceding; UF 76457.

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

### 3. Locality

The locality data is listed from least to most specific, using commas to divide each detail.

It is recommended to employ the English name in current usage where possible. If a different system is used, e.g., variant spellings or archaic names from label transcriptions, these should preferably be identified using quotes, with their current names given in square brackets.

MONTENEGRO • “Popovo Höhle bei Njegus” [Popovo Cave near Njegus]; 43.5291° N, 19.2074° E; 30 May 1903; Sturany leg.; NHMW 38260a.

#### **4. Geographic coordinates**

Various formats are accepted but it is important to include the degree symbol (°) as well as the direction (N/E/S/W), which distinguishes the data as a geographic coordinate:

- 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

Geographic coordinates should be presented to a maximum of 5 decimal places. Latitude and longitude are separated with a comma. Latitude is cited first, then longitude.

#### **5. Altitude/elevation/depth**

This type of measurement should be explicit in the material citations, e.g.:

- Altitude: alt. 489 m or 547 m a.s.l.
- Depth: depth 20 m

#### **6. Collection date**

Format: d(d) Mmm. YYYY

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.

#### **7. Collector (zoology)**

The name(s) of the collector(s) should always be followed by “leg.”; for expeditions, “exped.” can be used, e.g., “MNHN exped.”

#### **8. Collector and collection number (botany)**

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

For botanical disciplines that do not catalogue specimens on sheets (e.g., algae, diatoms), we ask that authors use “collected by: X”, because the term “leg.” does not have the same signification across all botanical fields.

#### **9. Additional data**

Ideally, the data fields identified above should be listed before any other collection data. If a different order is used, it is important to be as consistent as possible throughout the paper, or at least within a single treatment. Semicolons may be used to separate any additional data into appropriate fields, e.g.:

SWEDEN • ♂; Halland, Halmstad; Gårdshult, Buskasticket; 56.41° N, 13.91° E; 3–25 May 2005; Swedish Malaise Trap Project leg.; trap 35; collecting event: 1786; Malaise trap; hay meadow; NHRS CEC1405 • ♂; Öland, Mörbylånga, llevi; 56.61° N, 16.60° E; 8 Apr.–9 May 2016; M. & C. Jaschhof leg.; Malaise trap; herb-rich meadow near forest; SDEI CEC1429.
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Additional data can also be given in the appropriate field between brackets, e.g.:

**Holotype**

MYANMAR • 1 shell, holotype of *P. dextrorse* (D = 16 mm); Tenasserim Valley; NHMUK 1906.2.2.144.

**Other material**

THAILAND • 2 ♂♂, 1 ♂ (gonopods lost); Prachuap Khiri Khan Province, Kui Buri District, Hat Kham Subdistrict, Ban Yan Sue; 12°03'12" N, 99°37'52" E; ca 147 m a.s.l.; 31 Aug. 2007; ASRU members leg.; CUMZ.

**10. Associated sequences**

Specimen accession numbers, barcodes and DNA accessions should be identified as such, e.g., “GenBank: U34853.1”, “accession no.: 5587453”.

BRAZIL • ♂; Pernambuco, off Recife, approximately 20 nautical miles from the coast; REC I, dredge 4; 8°08'51.5" S, 34°34'08.0" W; 65 m depth; 7 Feb. 2018; agglomerations of sponges, rhodoliths and calcareous algae; GenBank 16S gene: MK918616; MOUFPE 19470.

**11. Repository data**

The repository data field should be composed of an institution acronym followed by a specimen code/catalogue number/barcode (where available).

**Zoology**

INSTITUTION ACRONYM

Acronyms for repositories must feature in a distinct list in the **Materials and methods** section, under a heading called “**Repositories**”, “**Institutional acronyms**” or “**Institutional abbreviations**”. Institution codes must follow GRSciColl (<https://gbif.org/grscicoll>) where possible.

SPECIMEN CODE

Where a specimen code is available, it should be explicit which specimen it refers to. This guarantees unambiguous interpretation, both by human readers and upon encoding. For example, in the citation below, we cannot distinguish which specimens are catalogued under which code:

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

This citation should be presented as follows:

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

Use the word “to” instead of a hyphen or an n-dash to show a range of specimen numbers. E.g., “NHMUK 213584 to 213595”.

## **Botany**

### REPOSITORY

Acronyms of herbaria must follow **Index Herbariorum** (<http://sweetgum.nybg.org/science/ih>) and a phrase to this effect will be included in the ‘Materials and methods’ section under the heading ‘**Repositories**’. Any acronyms used for repositories that do not feature in the Index Herbariorum must also be given here, e.g.:

### **Material and methods**

#### **Repositories**

Acronyms of herbaria follow Index Herbariorum (<http://sweetgum.nybg.org/science/ih/>), except for the following repository:

UANT = University of Antwerp, Belgium

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