

# Nomenclatural revision and typification of extra-Amazonian *Tachigali* (Leguminosae - Caesalpinioideae)

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## Abstract

**Background and aims** – The neotropical genus *Tachigali* comprises about 75 recorded species, including names described in *Sclerolobium*, synonymised in 1993 in *Tachigali* based on morphological, molecular, and anatomical characters. Most species are found in northern South America and the Atlantic Forest. However, some species are exclusively found in the savannas of central Brazil (Cerrado), Bolivia, and Paraguay. The *Tachigali* species from northern South America and Central America has already been revised. However, the extra-Amazonian *Tachigali* species were not correctly typified due to the impossibility of examining all syntypes. Therefore, the present work aims to present the nomenclatural review of the extra-Amazonian species of *Tachigali*.

**Material and methods** – The list of accepted extra-Amazonian *Tachigali* names and their basionyms was made and verified through online databases. The original descriptions were consulted online or in the Rio de Janeiro Botanical Garden Library. The type specimens were examined in virtual herbaria and through visits to the B, IAN, G, K, M, NY, P, R, RB, US, and W herbaria. The International Code of Nomenclature of algae, fungi, and plants was followed for the type designation and nomenclatural notes.

**Key results** – The nomenclatural review was carried out for 32 names. A total of 15 lectotypifications, representing 12 *Tachigali* species, and a new combination for *Tachigali rubiginosa* is proposed herein. Furthermore, the nomen dubium *Sclerolobium macrophyllum* is presented.

**Conclusion** – Our study provides the nomenclatural review for the extra-Amazonian *Tachigali* species, including notes about the type materials, collectors, and authors of all species names, in addition to the holotype and lectotype images.

## Keywords

Atlantic Forest, Caatinga, Cerrado, Fabaceae, *Sclerolobium*, *Tachigalia*

## INTRODUCTION

Aublet (1775) described the genus *Tachigali* Aubl. comprising two species from French Guiana (*T. paniculata* Aubl. and *T. trigona* Aubl.). The vernacular name “*tachi*” derives from the Tupi-Guarani language to mean stinging ants, while “*tachigali*” means “ant-loving tree” (Lewis et al. 2005). Some *Tachigali* species found in the Amazonia explain their popular name, as they are characterised by the presence of domatia in the petiole, rachis, or stipule

of the tree branches, which favours forming protective ecological relationships with ants, mainly those of the genus *Pseudomyrmex* Lund, 1831 (Dwyer 1957; Huamantupa-Chuquimaco et al. 2016, 2020; Pacheco 2016). This mutualist association is not recorded for extra-Amazonian species.

The neotropical genus *Tachigali* comprises approximately 75 species, although Huamantupa-Chuquimaco et al. (2019) suggest it may have more than 90 species. Most species are found in northern South

America (Amazonian Brazil, the Guianas, Venezuela, Colombia, Ecuador, and Peru) and the Atlantic Forest. However, some species are found exclusively in the savannas of central Brazil (Cerrado), Bolivia, and Paraguay (Van Der Werff and Zamora V 2010; Van Der Werff 2013; Huamantupa-Chuquimaco et al. 2019).

The genus *Sclerolobium* Vogel was described in 1837, and the name is based on the Greek “*scleros*”, meaning “hard”, and “*lobium*”, which means “fruit”, referring to the woody consistency of the fruits of the species in the genus. Tulasne (1844) was the first to consider a close affinity between *Tachigali* and *Sclerolobium*, mentioning the similarity of their fruits. Benth (1870) distinguished *Tachigali* from *Sclerolobium* based on flower morphology, where *Tachigali* flowers are zygomorphic with an eccentric position of the pistil stipe regarding the hypanthium, and *Sclerolobium* flowers are actinomorphic and have the pistil stipe attached centrally in the hypanthium. The same characteristics were used by Dwyer (1957) to distinguish the two genera. Later, Zarucchi and Herendeen (1993) synonymised *Tachigali* and *Sclerolobium* based on external morphology, including pollen grains and wood anatomy. Casanova et al. (2020, 2022) corroborated the circumscription of the genus *Tachigali* based on flower developmental patterns and ontogenetic characters.

A synopsis of the *Tachigali* species from northern South America, Central America, and Cusco (Peru) has already been discussed (see Van Der Werff 2008; Van Der Werff and Zamora V 2010; Huamantupa-Chuquimaco et al. 2016). Huamantupa-Chuquimaco (2020) provided results of the phylogeny of *Tachigali* and the taxonomic treatment of the Amazonian species. These results are in the process of being validly published (Isau Huamantupa Chuquimaco pers. comm.). The *Tachigali* names from the Atlantic Forest, Caatinga, and Cerrado have undergone nomenclatural modifications by Oliveira-Filho (2006) and Silva and Lima (2007). Silva and Lima (2007) indicated the holotypes and isotypes, but they did not designate lectotypes since they were unable to examine all syntype collections. Therefore, the present work aims to present the nomenclatural review of the extra-Amazonian *Tachigali* names.

## MATERIAL AND METHODS

The list of extra-Amazonian *Tachigali* species names and their basionyms was made with the “Build a checklist” tool, developed by Plants of the World Online (POWO 2023), and all names were verified in the Flora e Funga do Brasil (2023), International Plant Names Index (IPNI 2021), and Tropicos.org (2023) databases. The original works were consulted in the Biodiversity Heritage Library (BHL 2022), except for the journal *Lloydia* and the book *Catálogo de Árvores Nativas de Minas Gerais* (Oliveira-Filho 2006), which were consulted in the Rio de Janeiro Botanical Garden Library as they are not available online.

The type specimens were consulted in the JSTOR (2022), Re flora (2021), and SpeciesLink Network (2023) databases, in addition to the databases of the following herbaria: B, F, K, NY, P, US, and W (acronyms according to Thiers 2023), the specimens were also consulted through visits to the B, G, IAN, K, M, NY, P, R, RB, US, and W herbaria. The International Code of Nomenclature for algae, fungi and plants (ICN; Turland et al. 2018) was followed for type designation and name validation.

The type materials’ barcodes or herbarium registration numbers were indicated. The records with a herbarium registration number but with more than one preparation received this registration number in addition to the number of preparations and their barcodes. Accepted names are shown in bold. Seen specimens are marked with an exclamation mark (“!”) after the barcode. The effective dates of publication and locality corrections were inserted between square brackets “[ ]” when they differ from the original references. The type specimens indicated by Silva and Lima (2007) that were not found were not included in the work.

## NOMENCLATURAL REVIEW

The nomenclatural review comprised 12 *Tachigali* species from the Atlantic Forest, Caatinga, and the savannas of central Brazil (Cerrado), Bolivia, and Paraguay, totalling 32 names. A total of 15 lectotypifications and a new combination for *Tachigali rubiginosa* is proposed herein. Furthermore, the nomen dubium *Sclerolobium macrophyllum* is presented.

### 1. *Tachigali aurea* Tul. (Tulasne 1844: 169)

*Sclerolobium aureum* (Tul.) Benth. (Benth 1870: 51) – Type: same as for *Tachigali aurea*.

*Sclerolobium aureum* var. *velutinum* Benth. (Benth 1870: 51) – Type: BRAZIL – São Paulo • s.d.; fl.; Riedel s.n.; lectotype (**designated here**): K [K000841634!]. – Mato Grosso do Sul • Brasília. In campis siccis ad Rio Coxim; s.d.; fl.; L. Riedel 463; remaining syntype: K [K00264406!].

*Sclerolobium aureum* var. *polyphyllum* Hassl. (Hassl 1910: 131) – Type: PARAGUAY – Esperanza • Sierra de Amambay, in campis, “Serrados” [Cerrado]; s.d.; fr.; T. Rojas (E. Hassler Herbarium n°10573); lectotype (**designated here**): G n°350821 [3 sheets, G00400107!, G00400052!, G00400051!]; isolectotypes: K [K000264419!], P [P00481991!].

*Sweetia velutina* Mohlenbr. (Mohlenbrock 1963: 24), nom. illeg., non *Sweetia velutina* (Spreng.) G. Don – Type: BRAZIL – Goiás • Goiania; 20 Jan. 1957; fl.; M. Magalhães 8618; holotype: IAN [IAN106580!].

*Acosmium mohlenbrockii* Yakovlev (Yakovlev 1969: 352) – Type: same as for *Sweetia velutina*.

**Type.** BRAZIL – Mato Grosso • Cujaba Brasiliae austro-occidentalis [Cuiabá]; 1829; fl.; A.L.P. Silva Manso 64. (Mart. Herb. Fl. Bras. 1148); lectotype (**designated here**): P [P00835771!]; isolectotypes: BR [BR0000005215522!, BR0000005214891], F frag. [V0057952F!], G [2 sheets, G0367878!], HAL [HAL0120314!], K [K000780095!], M [M0215297!, M0215298!], NY [NY00022925!].

**Remaining syntypes.** BRAZIL – Bahia • “Marais de Japira”; 1840; fl.; Blanchet 3080; BR [BR0000005214860, BR0000005215195], G [G00367862; 2 sheets, G00367871; 2 sheets, G00367897], NY [NY01187809], P [P03641876, P03641940, P03641942], W [W0028305, W1889-0121563]. – Minas Gerais • “Minas Geraes prope Curvelho [Curvelo]. Bois n°65”; 1838; fl.; Claussen 965; GH [GH00286814], P [P0022921, P03641873, P03641884, P03641890, P03641892, P03641943, P03641944], RB [RB00539787].

**Notes.** The name *Tachigali* has an orthographical variant initiated by Jussieu, who cited the genus as “*Tachigalia*” (Jussieu 1789). Tulasne (1844) described the *Tachigali* species in his work as “*Tachigalia*”, and when describing *Tachigali aurea*, he cited two distinct forms ( $\alpha$  and  $\delta$ ), lacking a subspecific epithet. For the first one, Tulasne (1844) attributed the gatherings of Claussen 965 and Blanchet 3080 as examined materials, while for the other one, he cited “Mart. Herb. Fl. Bras. Number 1148”, which is the type for the species. The forms were mainly distinguished by pubescence, petioles and petiolules shape, and inflorescence and flower colouration (Tulasne 1844). Currently, all specimens cited by Tulasne are circumscribed in *T. aurea*, with no form designation (Dwyer 1957).

Tulasne (1844) dedicated himself to the collection of the Museum of Natural History in Paris (P) (Stafleu and Cowan 1979), and he makes it clear in the introduction of his work that most of the plants described are specimens from the “Brazilian herbarium” collection deposited at P. Considering the three gatherings cited by Tulasne (1844), 30 specimens were found, including one glass negative from B herbarium (F; Grimé and Plowman 1987). The specimen at B was not located because it was probably destroyed during World War II (Merrill 1943). The specimen at P (P00835771) was chosen as the lectotype (Fig. 1A, E). It is well-preserved and belongs to the main type collection of the species (form  $\delta$ ). Tulasne could have had access to all the specimens found, and there is a good chance that this specimen in P was seen. Among the A.L.P. Silva Manso gathering, one from BR (BR0000005215522) was used to obtain information about the collector, as it is the only one with a handwritten label indicating Silva Manso as the collector, his collection number, and the date (Fig. 1B, F).

Tulasne cited “*Leptolobium luteum* Mart. Herb. Fl. Bras. N°1148 (Cat. Autor. Absque descriptione)” in the synonymy of *T. aurea*. However, this name represents a nomen nudum (see ICN Art. 38.2, Ex. 1; Turland et al. 2018) assigned by Martius in the manuscript, which

contains the numbers 723 to 1310 of Mart. Herb. Fl. Bras., without description or diagnosis.

Bentham (1870) described *S. aureum* var. *velutinum* and cited two Riedel gatherings (see ICN Art. 9.6, Ex. 6; Turland et al. 2018); the author does not mention the herbarium of the specimens, only the locality. Bentham devoted himself to botanical studies in England and donated his herbarium to the Royal Botanic Gardens in 1854, herbarium K (Urban 1906). Two specimens were found in K referring to the mentioned localities (Riedel 463 and Riedel 457), both with Riedel’s handwritten labels (Fig. 1C, G), and they additionally have the stamp referring to Bentham’s herbarium (Fig. 1H). The specimen collected in São Paulo (K000841634) is here designated as the lectotype (Fig. 1C), as it is in accordance with the protologue, is well-preserved, and has the most complete material (entire inflorescence).

Hassler (1910) described *S. aureum* var. *polyphyllum* based on the glabrous leaves compared to *S. aureum* and cited a gathering of T. Rojas (Hassler 1910), his herbarium number (E. Hassler Herbarium n°10573), and he had access to all samples, as his calligraph can be identified on the specimen’s label (Burdet 1975). The material at G is chosen as the lectotype, as it agrees with the protologue, is well-preserved, and represents the completest material, with the vegetative part complete and fruits intact (Fig. 1D, I–K).

Dwyer (1957) discussed the two forms of *S. aureum* created by Tulasne (1844), synonymised the varieties *S. aureum* var. *velutinum* and *S. aureum* var. *polyphyllum* in *S. aureum* var. *aureum*, and attributed the gathering of A.L.P. Silva Manso (“Mart. Herb. Fl. Bras. 1148”) as the type. The author did not mention a single herbarium for it, but the syntypes (B, F, photo and fragment, NY, and US), so his citation for the type cannot be considered as the lectotypification of *Tachigali aurea* (Dwyer 1957; see ICN Art. 7.11, Ex. 13; Turland et al. 2018). In addition, the author commented that the variety described by Bentham is probably equivalent to Tulasne’s  $\alpha$  form, and after studying all materials, concluded that there is significant variation in the density of the pubescence of *T. aurea* (Dwyer 1957).

Mohlenbrock (1963) described *Sweetia velutina*, a later homonym for the name *Sweetia velutina* (Spreng.) G. Don and attributed a specimen of *Tachigali aurea* as the holotype (Fig. 1L–M). The basonym of this name was described by Sprengel (1826) and first combined by Don (1832). It is circumscribed in *Galactia striata* (Jacq.) Urb. In an attempt to validate the name, Yakovlev (1969) created *Acosmium mohlenbrockii* Yakov., a replacement name for *Sweetia velutina* Mohlenbr., based on the same type material. Both names are now synonyms of *Tachigali aurea*.

2. *Tachigali beaurepairei* (Harms) L.F. Gomes da Silva & H.C. Lima (Silva and Lima 2007: 398)

*Sclerolobium beaurepairei* Harms (Harms 1904 [1903]: 23)

**Type.** BRAZIL – Rio de Janeiro • [Nova Friburgo] Alto Macahé de Nova Friburgo; 4 Dec. 1892; fl.; A.F.M. Glaziou 20286; lectotype (**designated here**): P [P00577087!]; isolectotypes: C [C10012348!], F frag. [V0092498F!], K [K000264430!], NY [NY00022934], P [P0835772!], RB [RB00539702!].

**Remaining syntypes.** BRAZIL • [Nova Friburgo] Alto Macahé de Nova Friburgo; 2 Nov. 1890; fl.; A.F.M. Glaziou 18206; C [C10012349!, C10012350!], F [V0057920F!], G [G00367882!], MPU [MPU023339!], NY [NY00022935!], P [P00835776!, P0083775!, P0083776!], R [R000008764!] • [Nova Friburgo] Alto Macahé de Nova Friburgo; 2 Nov. 1890; fl.; A.F.M. Glaziou 19879; K [K000264429!], NY [NY00022936!]; P [P00835773!, P00835774!].

**Notes.** Harms cited three of Glaziou's gatherings in the original work on *Sclerobium beaurepairei* (see ICN Art. 9.6, Ex. 6; Turland et al. 2018) without indication

of the herbarium. There are a total of 20 samples of the cited specimens and one negative from B herbarium (F; Glaziou 20286; Grimé and Plowman 1987). Harms was a German botanist whose herbarium and type materials were stored at the B herbarium (Stafleu and Cowan 1979). Hence, the specimens deposited at B were likely part of the materials used by Harms to describe the taxon and were probably destroyed during World War II (Merrill 1943). The samples available for lectotype designation are in accordance with the protologue, and some are well-conserved. The specimen deposited at P (P00577087) is in the best condition and is therefore designated as the lectotype (Fig. 2A, E).

The material housed at R (R000008764) has an original handwritten label with reference to the specimen number "1826", which is likely an error since Glaziou only has three records of *Sclerobium beaurepairei*: Glaziou 18206,



**Figure 1.** Type specimens of *Tachigali aurea*, *Sclerobium aureum* var. *velutinum*, *Sclerobium aureum* var. *polyphyllum*, *Sweetia velutina*, and *Acomsium mohlenbrockii*. A. Lectotype designated for *Tachigali aurea*. B. Specimen of *S. aureum* with specimen collection data. C. Lectotype designated for *S. aureum* var. *velutinum*. D. Lectotype designated for *S. aureum* var. *polyphyllum* [G00400052]. E. Handwritten label with specimen data of *S. aureum*. F. Handwritten label with specimen collection data. G. Riedel's handwritten label with specimen collection data of *S. aureum* var. *velutinum* specimens. H. Bentham's herbaria stamp of *S. aureum* var. *velutinum* specimens with the date of 1854, the moment of inclusion in the Kew Herbarium (K). I. Label with specimen collection data of *S. aureum* var. *polyphyllum*. J–K. Lectotype designated for *S. aureum* var. *polyphyllum* [G00400107, G00400051]. L. Lectotype designated for *Sweetia velutina*. M. Handwritten label with specimen data of *Sweetia velutina*.

19879, and 20286 (Glaziou 1908), the same ones used for the species description (Fig. 2B, F). This specimen is therefore *Glaziou 18206* and was considered part of the original material. In addition, the specimen (RB00539701) with the same locality as the syntypes *Glaziou 18206* and *Glaziou 19879* was found in the RB herbarium without any reference to the record number, making it impossible to know which of the specimens it represents, so it was not considered part of the original material.

3. *Tachigali densiflora* (Benth.) L.F.Gomes da Silva & H.C.Lima (Silva and Lima 2007: 399)

*Sclerolobium densiflorum* Benth. (Bentham 1870: 51)

**Type.** BRAZIL – Bahia • “partia merid de la prov de Bahia”; 1840; fl.; *J.S. Blanchet 3206A*; holotype: G [G00367892!].

**Notes.** When describing *Sclerolobium densiflorum*, Bentham (1870) designated the specimen *J.S. Blanchet 3206A* as the holotype (Fig. 2C, G), deposited in the de Candolle’s herbarium at the time and was later donated by his relatives to the G herbarium in 1921, as indicated by an annotation on the label of the G specimens (Fig. 2G). The *J.S. Blanchet 3206* specimens deposited in G (2 sheets, G00367903) and in F (V0057923F) were not considered isotypes, as they were not included by the author in the protologue.

4. *Tachigali denudata* (Vogel) Oliveira-Filho (Oliveira-Filho 2006: 140)

*Sclerolobium denudatum* Vogel (Vogel 1837: 396) – Type: same as for *Tachigali denudata*.



**Figure 2.** Type specimens of *Sclerolobium beaufeirei*, *Sclerolobium densiflorum*, *Sclerolobium denudatum*, and *Sclerolobium glaziovii*. A. Lectotype designated for *S. beaufeirei*. B. Specimen of *Tachigali beaufeirei* at R. C. Holotype of *S. densiflorum*. D. Lectotype designated for *S. denudatum*. E. Handwritten label of the lectotype of *S. beaufeirei*. F. Handwritten label of the specimen of *Tachigali beaufeirei* at R with an error in the citation of the collector number. G. Handwritten label of the specimen of *S. densiflorum* with the record number *Blanchet 3206A* and information about de Candolle’s herbarium donation. H. Glass negative of *S. glaziovii*, with Taubert’s signature. I. Lectotype designated for *S. glaziovii*. J. Label of the specimen of *S. denudatum* with the citation “Herb. Reg. Berolinense.” K. Handwritten label of the specimen of *Sclerolobium glaziovii* with Taubert’s signature. L. Handwritten label of the lectotype of *S. glaziovii*.

*Sclerobium glaziovii* Taub. (Taubert 1892: 80) – Type: BRAZIL – Rio de Janeiro • Floresta da Tijuca; 2 Sep. 1882; fl.; A.F.M. *Glaziou* 13.735; lectotype (**designated here**): P [P00577094!]; isolectotypes: F neg., G [G00367899!], K [K000264425!]; P [P0577093!]; RB [RB0539710!].

**Type.** BRAZIL • “Brasilia Meridionalis”; s.d.; fr.; F. Sellow s.n.; lectotype (**designated here**): K [K000262570!]; isolectotypes: B [B 10 0367786!], P [P00835777!].

**Notes.** Vogel (1837) described *Sclerobium denudatum* with reference to a gathering made by Sellow but without mentioning the herbarium. The specimens collected by Sellow were mainly deposited at B and R, but the duplicates were later distributed to other herbaria (Urban 1906; Carvalho et al. 2020). Vogel developed his academic career at the University of Berlin, so he likely had access to Sellow’s specimens deposited in B. Five specimens and one negative from Kunth’s herbarium were found (Treviranus 1849; Grimé and Plowman 1987). The specimen housed at B and probably studied by Vogel may have been destroyed in World War II (Merril 1943); on the other hand, the material located there is a donation from NHV herbarium in 1936, almost 100 years later. The specimen at K (K000262570) is designated as the lectotype, as it agrees with the protologue, the photograph housed in F, and it has the stamp “Herb. Reg. Berolinense.”, indicating that it was a donation from B, so maybe it could be a part of the material seen by the author (Fig. 2D, J).

The name *S. glaziovii* was described by Taubert (1892), citing only the gathering *Glaziou* 13735 and the locality. Five specimens were located, and one glass negative (F) was made from the B herbarium (F; Grimé and Plowman 1987). The negative has an annotation with Taubert’s handwritten label (Burdet 1978), indicating that the B specimen from the negative was seen by the author (Fig. 2H, K). This specimen of B has not been located, as it was probably destroyed in World War II (Merril 1943). The specimen housed at P (P00577094) is chosen as the lectotype (Fig. 2I, L), as it agrees with the protologue, the photograph housed at F, and is a complete and well-conserved specimen.

5. *Tachigali duckei* (Dwyer) Oliveira-Filho (Oliveira-Filho 2006: 140)

*Sclerobium duckei* Dwyer (Dwyer 1957: 109)

**Type.** BRAZIL – Rio de Janeiro • Itatiaia, Parque Nacional, Lote Hansen, borda da mata com o roçado; 1 Oct. 1940; fl., fr.; W. Duarte de Barros 48; lectotype (**designated here**): RB n°45677 [3 sheets, RB00585813!, RB00585812!, RB00539707!]; isolectotype: SP [SP000943!].

**Notes.** Dwyer (1957) indicated that the type material of *S. duckei* is deposited in herbarium R (T.: Duarte de Barros 48 (R)!). However, he referred to the Systematic Botany Section of the Botanical Garden of Rio de Janeiro as R, thus to the herbarium RB. The correction for the location of the type material is clarified in the present paper (see ICN Art. 9.2; Turland et al. 2018).

The specimen deposited in RB under the number 45677 is composed of three sheets. The first of which has the original herbarium labels and a determination label written by Dwyer, together with a barcode (RB00539707; Fig. 3A), and it is composed of two branches: one with leaves and the other with a leaf, inflorescence, and flowers. The second sheet (RB00585812; Fig. 3B) has a duplicate distribution stamp (Fig. 3C) indicating that the SP herbarium received one sample (Fig. 3D), and it is composed of a branch with leaves and a fruit. The third sheet (RB00585813; Fig. 3E) has a branch with two leaves and an envelope of fragments with leaflets, inflorescence side branches, flowers, and a fruit. The curator of the RB herbarium distributed part of the RB type collection to other herbaria in 2008 (Rafaela Campostrini Forzza pers. comm.), so the SP specimen was previously studied by Dwyer, making it impossible to consider the set deposited in RB to be seen as a holotype assembled in more than one preparation, as it is now only part of the whole. Therefore, the gathering located at RB under the number 45677 is chosen as the lectotype, as it is the complete material and what the author first designated.

6. *Tachigali friburgensis* (Harms) L.F.Gomes da Silva & H.C.Lima (Silva and Lima 2007: 399)

*Sclerobium friburgense* Harms (Harms 1928: 211)

**Type.** BRAZIL – Rio de Janeiro • Alto Macahé de Nova Friburgo; 26 Dec. 1881; fl.; A.F.M. *Glaziou* 19059; lectotype (**designated here**): P [P00350588!]; isolectotypes: F frag. [V0057924F!], K [K000262572!], NY [NY00022937!], P [P00350591!].

**Remaining syntypes.** BRAZIL • Alto Macahé de Nova Friburgo; 26 Dec. 1881; fl.; A.F.M. *Glaziou* 13734; P [P00350589!, [P00350590!], R [R000008768!].

**Notes.** Harms (1928) cited two of Glaziou’s gatherings without a herbarium designation in the original work (see ICN Art. 9.6, Ex. 6; Turland et al. 2018). Eight specimens and one glass negative from B herbarium (F; *Glaziou* 19059; Grimé and Plowman 1987) were found. The specimen at P (P00350588) is designated as the lectotype (Fig. 3F), as it agrees with the protologue, with the photograph housed at F, and it is well-preserved.

7. *Tachigali paratyensis* (Vell.) H.C.Lima (Lima 1995: 128)

*Cassia paratyensis* Vell. (Vellozo 1825 [1829]: 168)

**Type.** BRAZIL – Vellozo’s original parchment plate of Flora Fluminensis in the Manuscript Section of the Biblioteca Nacional do Rio de Janeiro; lectotype (**designated here**): cat. no.: mss1198653\_068; later published in Flora Fluminensis Icones vol. 4: t. 70 (Vellozo 1827 [1831]).

**Notes.** Unlike the other species mentioned, *Tachigali paratyensis* has *Cassia paratyensis* Vell. as its basionym, validly published in 1829 in Flora Fluminensis (Carauta 1973; Lima 1995). Lima (1995) transferred the name

to *Tachigali paratyensis* and cited Vellozo's published illustration, indicating it as the type. This cannot be considered a valid lectotypification because the published illustration is posterior to the publication of the protologue and, according to the ICN Art. 9.4 (Turland et al. 2018), the original material comprises those specimens and illustrations unpublished and published prior to, or at the time of, publication of the protologue (Fig. 3G). Considering this, the original illustration of *C. paratyensis* is here designated as the lectotype.

**8. *Tachigali pilgeriana* (Harms) Oliveira-Filho (Oliveira-Filho 2006: 140)**

*Sclerolobium pilgerianum* Harms (Harms 1904 [1903]: 24) – Type: same as for *Tachigali pilgeriana*.

*Sclerolobium striatum* Dwyer (Dwyer 1957: 87) – Type: BRAZIL – Rio de Janeiro • Matus do Jardim Botânico; 7 Feb. 1948; fl.; *Pessoal do Horto do Jardim Botânico s.n. (ex Herb. RB n°61518)*; lectotype (**designated here**):

MO [n°16570778!]; isolectotypes: MO [n°2703099!], F [V0075484F!, V007583F!], NY [NY01163392!, NY01163393!, NY1163394!], R [R000045714!], RB [RB00539721!], RFA [n°17982].

**Type.** BRAZIL – Rio de Janeiro • Petrópolis, à Caxambu; Mar. 1886; fl.; A.F.M. *Glaziou 15933*; lectotype (**designated here**): P [P00350585!]; isolectotypes: C [C10012351!], F frag. [V0057931F!, V0092499F!], G [G00367851!], K [K000264439!], P [P00350586!, P00614378!].

**Notes.** Harms (1904) cited a Glaziou gathering (*Glaziou 15933*) in the original work on *S. pilgerianum* without herbarium designation. The specimens deposited at B may have been the material used by the author to describe the taxon and were probably destroyed during World War II (Merrill 1943). Nine syntypes were found (see ICN Art. 9.6, Ex. 5; Turland et al. 2018) and one glass negative in F from a material from B (Grimé and Plowman 1987). The specimen in P (P00350585) is designated as the lectotype (Fig. 3H), as it agrees with the protologue, with the photograph housed at F, and it is well-preserved.



**Figure 3.** Type specimens of *Sclerolobium duckei*, *Sclerolobium friburgense*, *Cassia paratyensis*, *Sclerolobium pilgerianum*, and *Sclerolobium striatum*. A, B, E. Lectotype designated for *S. duckei*. C. Stamp from the specimen of *S. duckei* with the designation of duplicates. D. Remaining syntype of *S. duckei*. F. Lectotype designated for *S. friburgense*. G. Lectotype designated for *C. paratyensis*. H. Lectotype designated for *S. pilgerianum*. I. Lectotype of *S. striatum*.

In the original work of *S. striatum*, Dwyer (1957) indicated that the type is deposited in MO only with a registration number of the specimens at the herbarium of origin (RB n°61518), and there are two specimens of *S. striatum* at MO with the RB number: MO n°16570778 and MO n°2703099. The MO curatorial data indicate that specimen n°2703099 was added to the collection between 1979 and 1980 (Lauren Boyle pers. comm.) after the description of the name (in 1957). However, as Dwyer did not specify the MO number, to avoid future errors in the holotype citation, the material MO n°16570778 is designated as the lectotype (Fig. 3I). It is in accordance with the protologue and has a label written by Dwyer indicating that this material is part of the type.

9. *Tachigali rubiginosa* (Mart. ex Tul.) Deccache, Fraga & H.C.Lima, **comb. nov.**

urn:lsid:ipni.org:names:77340670-1

*Sclerolobium rubiginosum* Mart. ex Tul., Archives du Muséum d'Histoire naturelle 4: 123. 1844 (Tulasne 1844)

*Sclerolobium paniculatum* var. *rubiginosum* (Mart. ex Tul.) Benth. (Bentham 1870: 48)

*Tachigali rubiginosa* (Mart. ex Tul.) Oliveira-Filho (Oliveira-Filho 2006: 141), **nom. invalid.**

**Type.** BRAZIL – Mato Grosso • in sylvis prope Cujaba Brasiliae meridionalis [Cuiabá]; 1841; fl.; A.L.P. Silva Manso s.n. (Mart. Herb. Fl. Bras. n°1147); lectotype (**designated here**): K [K000264417!]; isolectotypes: BR [BR000000591529!, BR000000591352!, BR000000591562!, BR000000591595!, BR000000591598!], F [V0057930F!], G [2 sheets, G0367860!], M [M0215288!, M0215289!], NY [NY0022924!], P [P00835781!], W [W0004897!].

**Notes.** Tulasne (1844) published *Sclerolobium rubiginosum* from an unpublished manuscript by Martius (Mart. Herb. Fl. Bras.), and this name was later transferred to variety status by Bentham (1870) as *Sclerolobium paniculatum* var. *rubiginosum*. Thirteen specimens are now recognised in different collections. Tulasne likely saw the P specimen since the author dedicated himself to the P herbaria (Stafleu and Cowan 1979), but there is no explicit reference to the holotype. The material from K (K000264417) is chosen as the lectotype because it is in a better condition and represents part of two phenological stages (young flowers and fruits; Fig. 4A, G).

Oliveira-Filho (2006) made four new combinations for the *Sclerolobium* species native to Minas Gerais (Brazil) and circumscribed them under the genus *Tachigali*: *T. denudata*, *T. duckei*, *T. pilgeriana*, and *T. subvelutina* (Benth.) Oliveira-Filho. The author followed a consistent pattern in the new combinations, correctly cited the basionym (following ICN Art. 40.1; Turland et al. 2018), used the term “comb. nov.” for each one, and, in a note, mentioned that the new combination transferred *Sclerolobium* to *Tachigali*, following Lewis et al. (2005). However, Oliveira-Filho (2006) did not followed this pattern when transferring *Sclerolobium rubiginosum*

to *Tachigali*, referring to the name as “comb. ined.” (unpublished combination) and did not made it clear in the note that a new combination is being proposed, as in the other names.

In independent non-serial work submitted to educational institutes to obtain a degree, “comb. ined.” is regularly used to highlight that the name presented should not be considered valid but unpublished and provisional. These kinds of works are not effective publications without internal evidence to be considered as such, following ICN Art. 30.9 (Turland et al. 2018).

Despite correctly citing the basionym, the name published by Oliveira-Filho (2006) cannot be considered valid but a provisional and unpublished name (see ICN Art. 36.1; Turland et al. 2018). The use of “comb. ined.” should be interpreted in the same way as the use of “ad int. [ad interim, for the time being]” presented in ICN Art. 36.1, Ex. 6 (Turland et al. 2018), and as the use of “comb. ined.” in those independent non-serial work. Considering this, a new combination for *Tachigali rubiginosa* is proposed herein.

10. *Tachigali rugosa* (Mart. ex Benth.) Zarucchi & Pipoly (Zarucchi and Pipoly 1995: 411)

*Sclerolobium rugosum* Mart. ex Benth. (Bentham 1850: 237)

**Type.** BRAZIL • Cujaba [Cuiabá] et in prov. Minas Geraes; s.d.; fl.; A.L.P. Silva Manso s.n. (Mart. Herb. Fl. Bras. n°1155); lectotype (**designated here**): K [K000262571!]; isolectotypes: BR [BR000000591385!, BR000000591418!], G [G00367925!], M [M0215286!, M0215287!].

**Notes.** Bentham (1850) described *Sclerolobium rugosum* and attributed the authorship to Martius, even believing the name had not yet been described at the time. More than one specimen is mentioned in the original work of *S. rugosum*: one from Mato Grosso, Cuiabá and another from Minas Gerais, but as the record of Martius' Herbarium Florae Brasiliensis is made by species, both samples were combined under the number Mart. Herb. Fl. Bras. 1155, and thus cited in the protologue and later treatments. The only mention of A.L.P. Silva Manso is not in the materials (except from H.C. Lima's note on M0215286), but there is a citation by Bentham in Flora Brasiliensis (Bentham 1870). As A.L.P. Silva Manso gatherings are from Mato Grosso, part of the specimens could be made by this collector (Urban 1906). However, there is no collector information for the Minas Gerais records.

Seven syntypes were found (see ICN Art. 9.6; Turland et al. 2018) and a glass negative in F from M (M0215286) (Grimé and Plowman 1987). The specimen located at K (K000262571) is designated as the lectotype. It belonged to Bentham's herbarium, agrees with the protologue, and is well-preserved (Fig 4B, H).

11. *Tachigali subvelutina* (Benth.) Oliveira-Filho  
(Oliveira-Filho 2006: 141)

*Sclerolobium paniculatum* var. *subvelutinum* Benth.  
(Bentham 1870: 48)

**Type.** BRAZIL – Goiás • ad fl. Paranahyba prov. Goyaz; s.d.; fl.; Burchell 6095; lectotype (**designated here**): K [K000264418!]; isolectotype: P [P03642214!].

**Notes.** *Sclerolobium paniculatum* var. *subvelutinum* was described by Bentham (1870). The herbarium where the analysed material was housed was not mentioned, but Bentham devoted himself to botanical studies in England, and his collection was donated in 1854 to the K herbarium (Urban 1906). Two syntypes of *S. paniculatum* var. *subvelutinum* (see ICN Art. 9.6, Ex. 5; Turland et al. 2018) were found, one at P and the other at K. The material in P mentions a donation from the K herbarium, which is the origin of the specimens (Fig. 4C, I). It is possible that

Bentham had examined both specimens. However, the material located at K (K000264418) is designated as the lectotype, as it is well-conserved, is in the best condition, and is in accordance with the protologue (Fig. 4D).

12. *Tachigali urbaniana* (Harms) L.F.Gomes da Silva & H.C.Lima (Silva and Lima 2007: 400)

*Sclerolobium urbanianum* Harms (Harms 1904 [1903]: 23)

**Type.** BRAZIL – Rio de Janeiro • Rio D'Ouro, près de l'eau; 24 Aug. 1879; fl.; A.F.M. Glaziou 10683; lectotype (**designated here**): P [P00350582!]; isolectotypes: F frag. [V0093906F!], F [V0057933F!], G [G00367865!], K [K000264436!], P [P0035083!, P0035084!], R [R000008767!], S [S-R-9145!].

**Notes.** Harms (1904) referred to *Glaziou 10683* as the type material without specifying its herbarium origin.



**Figure 4.** Type specimens of *Sclerolobium rubiginosum*, *Sclerolobium rugosum*, *Sclerolobium paniculatum* var. *subvelutinum*, and *Sclerolobium urbanianum*. A. Lectotype designated for *S. rubiginosum*. B. Lectotype designated for *S. rugosum*. C. Remaining syntype of *S. paniculatum* var. *subvelutinum*. D. Lectotype designated for *S. paniculatum* var. *subvelutinum*. E. Lectotype designated for *S. urbanianum*. F. Remaining syntype of *S. urbanianum*. G. Label from the lectotype of *S. rubiginosum*. H. Label from the lectotype of *S. rugosum*. I. Label from *S. paniculatum* var. *subvelutinum*, which indicates the donation from the Kew herbarium. J. Label from the lectotype of *S. urbanianum*. K. Handwritten label of an *S. urbanianum* specimen, determined as *Swartzia flaemingii*. L. Annotation of H.C. Lima on a *S. urbanianum* specimen.

Nine syntypes were found (see ICN Art. 9.6; Turland et al. 2018), one glass negative from B herbarium (Grimé and Plowman 1987). The material from P (P00350582) is designated as the lectotype, as it is well-conserved, is in the best condition, and is in accordance with the protologue and the photograph at F (Fig. 4E, J).

There is a record of Glaziou material at G, which is a branch of *Sclerolobium urbanianum* in the same phenological state as the other syntypes of *S. urbanianum*, but has manuscript data from *Glaziou 10643*, determined as *Swartzia flaemingii* Raddi, collected in Tijuca, Rio de Janeiro, in 1880 (Fig. 4F, K). There is only a single record of *Sclerolobium urbanianum* made by Glaziou, so this specimen was considered part of the type material, as previously noted by H.C. Lima in October 2010 (Fig. 4L).

### Nomen dubium

*Sclerolobium macrophyllum* Vogel (Vogel 1837: 397)

Vogel described *Sclerolobium macrophyllum* in the same work and on the same page as *S. paniculatum* Vogel and referred to a record made by A.P. Silva Manso and J. Lhotsky “in campis” from Mato Grosso, Cuiabá (Brazil). Since Vogel worked in Berlin (Stafleu and Cowan 1979), it is possible he saw specimens available at B, which might have been later destroyed during World War II (Merrill 1943).

In the search for possible type specimens in the herbarium databases, two specimens supposedly collected by A.P. Silva Manso and J. Lhotsky and identified as *S. macrophyllum* were found. One of them is a specimen deposited in R under the number n°2664, composed of two sheets, both with a label from the Museu Nacional with the name “*Sclerolobium aureum* Benth.” and the locality “Mato Grosso. Cuyaba”, in addition to another label signed by Van Der Werff, in which he states that the sheets could be isotypes of *Sclerolobium macrophyllum*. In the original description, Vogel mentioned “Flores non vidi”, and the specimens deposited at R show a complete inflorescence in bloom and do not match the protologue in some regard, so they cannot be the original material that Vogel used to describe this species. After examining this material at R, we concluded that these specimens represent *Tachigali vulgaris* L.G.Silva & H.C.Lima.

The other specimen deposited at US, with a label from the Museum botanicum Berolinense (B) annotated as “*Sclerolobium macrophyllum* Vogel”, has no mention of the locality indicated by Vogel, nor the fruits described by him and does not match the protologue in some regard. As a result, this specimen cannot be used for the purpose of the application of the name *Sclerolobium macrophyllum*, and it may not be part of the type material, making this name a nomen dubium.

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